

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

### **HEAD 703 – BUILDINGS**

#### **Education – Secondary**

#### **261ES – Secondary school at Aberdeen Reservoir Road, Aberdeen**

Members are invited to recommend to Finance Committee the upgrading of **261ES** to Category A at an estimated cost of \$182.0 million in money-of-the-day prices for the construction of a new secondary school premises at Aberdeen Reservoir Road, Aberdeen to reprovise an existing aided secondary school.

### **PROBLEM**

Some schools are operating from premises which are underprovided by today's standards and should be reprovise when the opportunity arises.

### **PROPOSAL**

2. The Director of Architectural Services, with the support of the Secretary for Education (SED), proposes to upgrade **261ES** to Category A at an estimated cost of \$182.0 million in money-of-the-day (MOD) prices for the construction of a new secondary school premises at Aberdeen Reservoir Road, Aberdeen so as to reprovise an existing aided secondary school (the School) which is operating in substandard premises in the Southern District.

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**PROJECT SCOPE AND NATURE**

3. The proposed scope of **261ES** comprises site formation works<sup>1</sup> and the construction of a new secondary school premises –

Site formation works

- (a) formation of about 4 000 square metres (m<sup>2</sup>) of site platform and associated slope works;
- (b) re-alignment of a portion (about 40 m long) of Peel Rise;
- (c) landscaping works; and
- (d) environmental mitigation measures.

Construction of school premises

- (a) 30 classrooms;
- (b) 16 special rooms, including a computer-assisted learning room, a language room and a multi-purpose 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;

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<sup>1</sup> The site formation works including the design will be entrusted to the Civil Engineering and Development Department.

- (j) a library;
- (k) an assembly hall (which can also 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 at ground level and one at the rooftop of assembly hall);
- (n) a 30-m running track<sup>2</sup>;
- (o) a green corner<sup>3</sup>; and
- (p) ancillary accommodation, including a lift and relevant facilities for the handicapped.

4. The proposed new school premises will meet the planning target of providing two square metres of open space per student. A site plan is at Enclosure 1 and views of the school premises (artist's impression) are at Enclosure 2. We plan to start the site formation works in December 2007 for completion in September 2009 and construction of the new secondary school premises in September 2009 for completion in July 2011.

## JUSTIFICATION

5. The existing premises of the School, built in 1965 on a sloped site with existing building area of 2 500 m<sup>2</sup> only, falls short of the current standard for secondary schools. Certain essential facilities for effective teaching and learning, such as small group teaching room, multi-purpose area, home management room, needlework room, conference room, interview room, staff common room and student activity centre are lacking. The open space provision also falls short of the latest planning standard. The School has only marginally benefited from the

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<sup>2</sup> In order to make optimal use of the space of the campus, a 30-m running track will be provided in the covered playground.

<sup>3</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 weather station and planting beds.

School Improvement Programme<sup>4</sup> due to site constraints, under which only a few additional facilities were provided by partitioning existing rooms. The substandard and dilapidated facilities of the existing campus also require frequent repairs. Due to site constraints which pose difficulties for in-situ redevelopment<sup>5</sup>, reprovisioning is the most cost-effective way to provide quality teaching and learning environment for teachers and students of the School.

6. Upon completion, **261ES** will provide 30 classrooms and other facilities for accommodating the School which is operating 24 classes in the 2007/08 school year in the same district. Whether the number of operating classes would be increased from 24 to 30 immediately after the reprovisioning will depend on the actual supply and demand situation of secondary school places then and the enrolment situation of the School. Any extra classrooms will be efficiently utilised by the School for the teaching and learning of students.

## FINANCIAL IMPLICATIONS

7. We estimate the capital cost of the project to be \$182.0 million in MOD prices (see paragraph 9 below), made up as follows –

	<b>\$ million</b>
(a) Site formation	29.1
(b) Piling	19.4
(c) Building	65.0
(d) Building services	20.2
(e) Drainage	2.5
(f) External works	11.0

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<sup>4</sup> The School Improvement Programme involves some 740 existing schools to provide additional space and upgrade facilities to support teaching and learning.

<sup>5</sup> We are considering the future use of the existing premises upon reprovisioning of the School.

		\$ million	
(g)	Furniture and Equipment (F&E) <sup>6</sup>	6.0	
(h)	Consultants' fees for –	7.4	
	(i) Contract administration	3.2	
	(ii) Site supervision	4.2	
(i)	Contingencies	15.4	
	Sub-total	176.0	(in September 2007 prices)
(j)	Provision for price adjustment	6.0	
	Total	182.0	(in MOD prices)

8. The Civil Engineering and Development Department (CEDD) will undertake contract administration and supervision of site formation works. We propose to engage consultants to undertake contract administration and site supervision of the school construction works. A detailed breakdown of the estimate for consultants' fees by man-months is at Enclosure 3. The construction floor area (CFA) of the new school premises under **261ES** is 12 603 m<sup>2</sup>. The estimated construction unit cost, represented by the building and the building services costs, is \$6,760 per m<sup>2</sup> of CFA in September 2007 prices. We consider this comparable to similar school projects built by the Government. A comparison of the reference cost for constructing a 30-classroom secondary school based on an uncomplicated site with no unusual environmental or geotechnical constraints with the estimated costs for the new school premises is at Enclosure 4.

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

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<sup>6</sup> Based on an indicative list of F&E items required by the School. The indicative list is compiled on the basis of a survey on serviceability of the existing F&E of the School and the standard F&E reference list prepared by the Education Bureau for a new 30-classroom secondary school adopting the standard schedule of accommodation. The exact F&E cost will be calculated based on the F&E items to be required by the School in operating the actual number of classes.

Year	\$ million (Sept 2007)	Price adjustment factor	\$ million (MOD)
2007 – 08	1.7	1.00000	1.7
2008 – 09	16.5	1.00750	16.6
2009 – 10	23.4	1.01758	23.8
2010 – 11	50.2	1.02775	51.6
2011 – 12	45.9	1.03803	47.6
2012 – 13	23.9	1.05619	25.2
2013 – 14	14.4	1.07732	15.5
	176.0		182.0

10. We have derived the MOD estimates on the basis of the Government's latest forecast of trend rate of change in the prices of public sector building and construction output for the period 2007 to 2014. We will tender the site formation works through a standard re-measurement contract because the quantities of the geotechnical and excavation works may vary depending on actual ground conditions. We will award the school construction contract on a lump-sum basis because we can clearly define the scope of the works in advance. Both contracts will not provide for price adjustment because the contract period will not exceed 21 months.

11. The cost of F&E, estimated to be \$6.0 million, will be borne by the Government for the reprovisioning of the School. This is in line with the existing policy. The annual recurrent expenditure of the existing secondary school was \$30.3 million in the 2005/06 school year. Upon reprovisioning of the secondary school, the annual recurrent expenditure is estimated to be \$30.9 million if the number of operating classes remains at 24, with the difference being largely attributable to the increase in price level.

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## PUBLIC CONSULTATION

12. Southern District Council was consulted on the site formation works for **261ES** in September 2003 and the school project in November 2005. Members of the District Council expressed support on the two occasions.

13. We circulated an information note on the project to the Legislative Council Panel on Education on 4 October 2007. Members did not raise any comments.

## ENVIRONMENTAL IMPLICATIONS

14. Site formation works is not a designated project under the Environmental Impact Assessment Ordinance. CEDD completed a Preliminary Environmental Review (PER) in January 2001 for the site formation works and carried out further studies on construction noise, ecology, visual and landscape impacts as recommended by the PER. The PER and further studies concluded that the potential environmental impacts of the site formation works could be controlled to within the established standards and guidelines with the implementation of the recommended mitigation measures. The further study on construction noise has also recommended the implementation of noise monitoring and audit works for the site formation works. We have included a cost of \$800,000 for implementing the mitigation measures including noise monitoring and audit works under the site formation contract.

15. We also engaged a consultant to conduct a separate PER for the construction works in May 2007. The PER recommended installation of insulated windows and air-conditioning for rooms exposed to traffic noise exceeding the limits recommended in the Hong Kong Planning Standards and Guidelines. The recommended mitigation measures are as follows –

<b>Mitigation measures</b>	<b>Estimated cost \$ million (in Sept 2007 prices)</b>
(a) Insulated windows and air-conditioning for four special rooms on the 2/F, 3/F, 6/F and 7/F at the eastern and northern facades of the special room block	0.47

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<b>Mitigation measures</b>	<b>Estimated cost \$ million (in Sept 2007 prices)</b>
(b) Insulated windows and air-conditioning for three special rooms on the 2/F and 3/F of the assembly hall block	0.34

With such mitigation measures in place, the project will not have long term environmental impacts. We have included the cost of the above mitigation measures as part of the building services in the project estimate.

16. During site formation and school 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 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. We have considered measures in the planning and design stages to reduce the generation of construction waste where possible. These include coordinating the site formation design and the school building design to reduce the extent of site formation works and the amount of earthworks, and using metal site hoardings and signboards so that these materials can be recycled or reused in other projects. In addition, we will require the contractors of the construction works to reuse inert construction waste (e.g. use of excavated materials for filling within the site) on site or in other suitable construction sites as far as possible, in order to minimise the disposal of inert construction waste to public fill reception facilities<sup>7</sup>. We will encourage the contractors of the construction works to maximise the use of recycled or recyclable inert construction waste, as well as the use of non-timber formwork to further minimise the generation of construction waste.

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<sup>7</sup> Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of inert construction waste in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.



18. We will also require the contractors of the construction works to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation means to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will require the contractors of the construction works to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. We will also control the disposal of inert construction waste and non-inert construction waste to public fill reception facilities and landfills respectively through a trip-ticket system.

19. We estimate that the project will generate the following construction waste —

	Site formation		School construction	
	tonnes	%	tonnes	%
Inert construction waste reused on site or other construction sites	12 100	29.7	7 605	56.3
Inert construction waste to public fill reception facilities for subsequent reuse	26 300	64.6	5 070	37.5
Non-inert construction waste to landfills	2 300	5.7	840	6.2
Total construction waste generated	40 700	100	13 515	100

20. The total cost for accommodating construction waste at public fill reception facilities and landfill sites is estimated to be \$1.24 million for this project (based on a unit cost of \$27/tonne for disposal at public fill reception facilities and \$125/tonne<sup>8</sup> at landfills).

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<sup>8</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 is likely to be more expensive) when the existing ones are filled.

## LAND ACQUISITION

21. The project does not require any land acquisition.

## BACKGROUND INFORMATION

22. We upgraded the site formation works under **261ES** to Category B in September 2001. CEDD engaged consultants in March 2002 to undertake further studies, site investigation and detailed design for the site formation works at an estimated cost of \$2.0 million. CEDD charged the amount to block allocation **Subhead 5101CX** “Civil engineering works, studies and investigations for items in Category D of the Public Works Programme”. CEDD has completed the site investigation, detailed design and preparation of tender documents for the proposed site formation works.

23. We upgraded the school construction works under **261ES** to Category B in October 2005. We engaged an architectural consultant in December 2006 to undertake the detailed design, PER and topographic survey. We will engage a quantity surveying consultant in December 2007 to prepare the tender documents for the school construction. The cost of the above consultancy services and works is estimated to be about \$2.3 million. We will charge 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 architectural consultant has completed the detailed design, PER and topographical survey.

24. The proposed works will involve removal of 84 trees. All trees to be removed are not important trees<sup>9</sup>. We will incorporate planting proposals as part of the project, including estimated quantities of 695 trees, 3 200 shrubs and 2 000 m<sup>2</sup> of grassed area.

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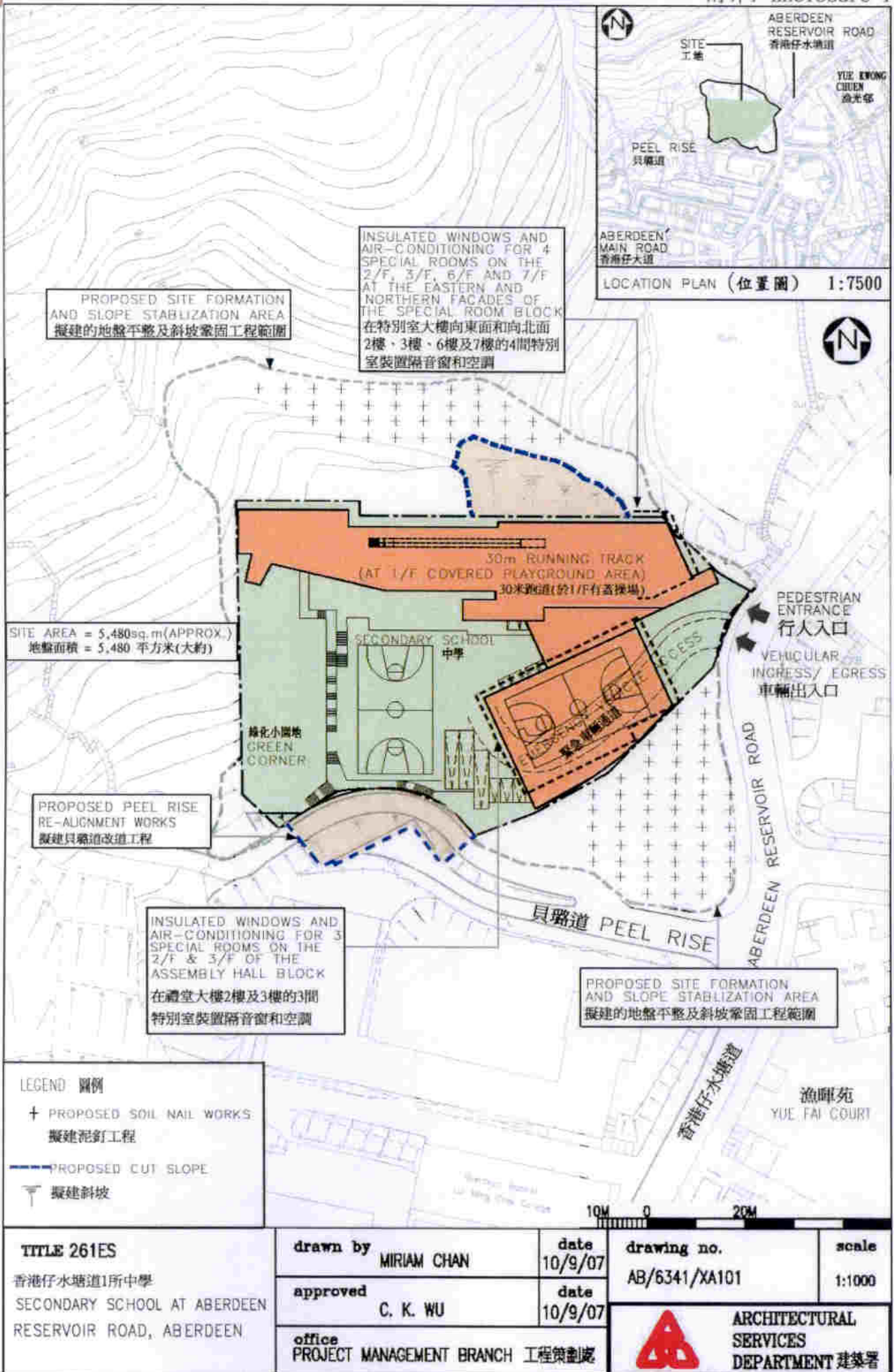
<sup>9</sup> “Important trees” refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria -

- (a) trees of 100 years old or above;
- (b) trees of cultural, historical or memorable significance e.g. Fung Shui tree, tree as landmark of monastery or heritage monument, and trees in memory of an important person or event;
- (c) trees of precious or rare species;
- (d) trees of outstanding form (taking account of overall tree sizes, shape and any special features) e.g. trees with curtain like aerial roots, trees growing in unusual habitat; or
- (e) trees with trunk diameter equal or exceeding 1.0 metre (measured at 1.3 metre above ground level), or with height/canopy spread equal or exceeding 25 metres.

25. We estimate that the proposed works will create about 186 jobs (162 for labourers and another 24 for professional/technical staff) providing a total employment of 3 348 man-months.

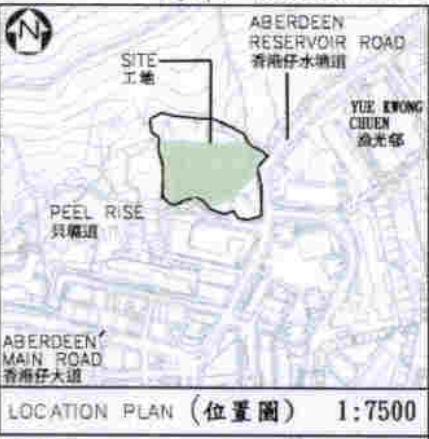
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Education Bureau  
October 2007

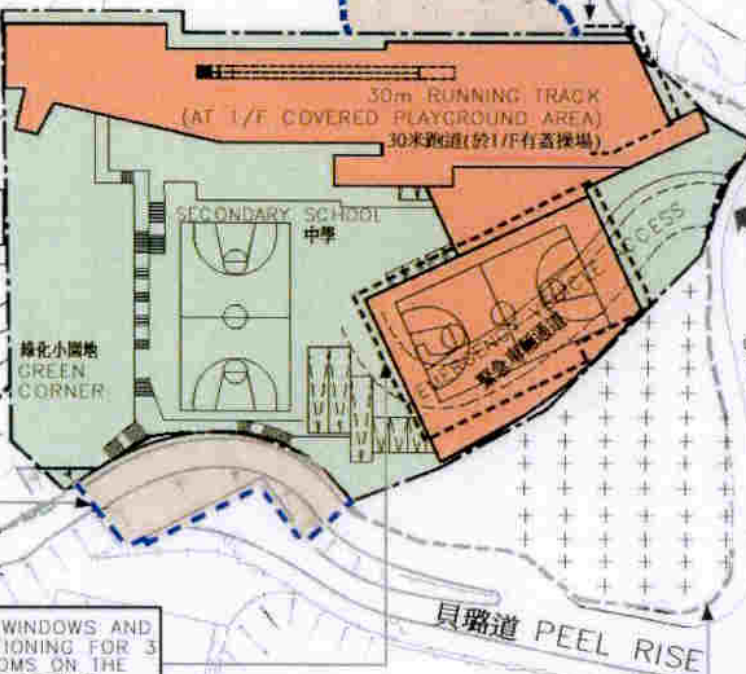


PROPOSED SITE FORMATION AND SLOPE STABILIZATION AREA  
擬建的地盤平整及斜坡鞏固工程範圍

INSULATED WINDOWS AND AIR-CONDITIONING FOR 4 SPECIAL ROOMS ON THE 2/F, 3/F, 6/F AND 7/F AT THE EASTERN AND NORTHERN FACADES OF THE SPECIAL ROOM BLOCK  
在特別室大樓向東面和向北面2樓、3樓、6樓及7樓的4間特別室裝置隔音窗和空調



SITE AREA = 5,480sq.m (APPROX.)  
地盤面積 = 5,480 平方米 (大約)



PROPOSED PEEL RISE RE-ALIGNMENT WORKS  
擬建貝霧道改道工程

INSULATED WINDOWS AND AIR-CONDITIONING FOR 3 SPECIAL ROOMS ON THE 2/F & 3/F OF THE ASSEMBLY HALL BLOCK  
在禮堂大樓2樓及3樓的3間特別室裝置隔音窗和空調

PROPOSED SITE FORMATION AND SLOPE STABILIZATION AREA  
擬建的地盤平整及斜坡鞏固工程範圍

LEGEND 圖例

+	PROPOSED SOIL NAIL WORKS 擬建泥釘工程
—	PROPOSED CUT SLOPE 擬建斜坡

**TITLE 261ES**  
香港仔水塘道1所中學  
SECONDARY SCHOOL AT ABERDEEN  
RESERVOIR ROAD, ABERDEEN

drawn by MIRIAM CHAN	date 10/9/07
approved C. K. WU	date 10/9/07
office PROJECT MANAGEMENT BRANCH 工程策劃處	

drawing no. AB/6341/XA101	scale 1:1000
 <b>ARCHITECTURAL SERVICES DEPARTMENT 建築署</b>	



VIEW OF THE SCHOOL PREMISES FROM SOUTH-EASTERN DIRECTION (ARTIST'S IMPRESSION)  
從東南面望向校舍的構思圖



VIEW OF THE SCHOOL PREMISES FROM SOUTH-WESTERN DIRECTION (ARTIST'S IMPRESSION)  
從西南面望向校舍的構思圖

<b>TITLE 261ES</b> 香港仔水塘道1所中學 SECONDARY SCHOOL AT ABERDEEN RESERVOIR ROAD, ABERDEEN	<b>drawn by</b> MIRIAM CHAN	<b>date</b> 10/9/07	<b>drawing no.</b> AB/6341/XA102	<b>scale</b> N.T.S
	<b>approved</b> C. K. WU	<b>date</b> 10/9/07	 <b>ARCHITECTURAL SERVICES DEPARTMENT 建築署</b>	
	<b>office</b> PROJECT MANAGEMENT BRANCH 工程策劃處			

**261ES – Secondary school at Aberdeen Reservoir Road, Aberdeen**

**Breakdown of the estimate for consultants' fees for the school construction works**

Consultants' staff costs			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee (\$ million)
(a)	Contract administration (Note 2)	Professional	–	–	–	2.6
		Technical	–	–	–	0.6
(b)	Site supervision (Note 3)	Professional	12.1	38	1.6	1.1
		Technical	102.8	14	1.6	3.1
					Total	7.4

\* 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 April 2007, MPS point 38 = \$56,945 per month and MPS point 14 = \$18,840 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 **261ES**. The assignment will only be executed subject to Finance Committee's approval to upgrade **261ES** 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 30-classroom secondary school project  
with the estimated cost of 261ES**

**\$ million (in Sept 2007 prices)**

	<b>Reference cost*</b>	<b>261ES</b>	
(a) Site formation	–	29.1	(See note A)
(b) Piling	12.3	19.4	(See note B)
(c) Building	63.5	65.0	(See note C)
(d) Building services	18.7	20.2	(See note D)
(e) Drainage	2.8	2.5	(See note E)
(f) External works	11.5	11.0	(See note F)
(g) Furniture and equipment	–	6.0	(See note G)
(h) Consultants' fees	–	7.4	(See note H)
(i) Contingencies	10.9	15.4	
	Total	119.7	
	119.7	176.0	
(j) Construction floor area	12 238 m <sup>2</sup>	12 603 m <sup>2</sup>	
(k) Construction unit cost {[(c) + (d)] ÷ (j)}	\$6,717/m <sup>2</sup>	\$6,760/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.

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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 m, 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 secondary school site area of 6 950 m<sup>2</sup> 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 for meeting new demand of school places.
7. The reference cost for comparison purpose is subject to review regularly. We will review, and revise if necessary, the reference cost which should be adopted for future projects.

**Notes**

- A. The cost of site formation works is site specific. It is required because the site has to be formed and a portion of Peel Rise has to be re-aligned before commencement of construction works.
- B. The piling cost is higher because vertical and inclined mini-piles have to be used on the sloping site to avoid any adverse effect on the surrounding slopes.
- C. The building cost is higher because of the slightly larger construction floor area.
- D. The cost of the building services works is higher because of the larger construction floor area and the provision of air-conditioning as a noise mitigation measure.

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- E. The cost of drainage works is lower because of the smaller site area.
- F. The cost of external works is lower because of the smaller site area.
- G. The cost of furniture and equipment, estimated to be \$6.0 million, will be borne by the Government in line with existing policy for reprovisioning of existing schools.
- H. Consultants' fees are required for contract administration and site supervision of the building works.