

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

### **HEAD 703 - BUILDINGS**

#### **Education - Secondary**

**241ES - Two secondary schools in To Kwa Wan Reclamation**

**242ES - Two secondary schools at Lee On Road, Kwun Tong**

Members are invited to recommend to Finance Committee the upgrading of **241ES** and **242ES** to Category A at estimated costs of \$223.0 million and \$218.2 million respectively in money-of-the-day prices for the construction of two secondary schools in To Kwa Wan Reclamation and another two at Lee On Road, Kwun Tong.

### **PROBLEM**

We do not have enough secondary schools to meet the increase in demand for new school places by the school year 2003/04.

### **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 \$441.2 million in money-of-the-day (MOD) prices -

	<b>Project Estimate \$ million (MOD)</b>
(a) <b>241ES</b> - Two secondary schools in To Kwa Wan Reclamation	223.0
(b) <b>242ES</b> - Two secondary schools at Lee On Road, Kwun Tong	218.2
Total	<u>441.2</u>

### PROJECT SCOPE AND NATURE

3. The two proposed schools under **241ES**, as well as those under **242ES**, will be provided with the following facilities -

	<b>241ES and 242ES (each school)</b>
(a) classrooms;	30
(b) special rooms, including a computer-assisted learning room and a language room;	16
(c) small group teaching rooms;	3
(d) guidance activity room;	1
(e) interview rooms;	2
(f) staff room;	1
(g) staff common room;	1
(h) student activity centre;	1
(i) conference room;	1
(j) library;	1
(k) assembly hall (which, together with the /(k) .....	1

**241ES and 242ES**  
(each school)

roof of the assembly hall block, can also be used for a wide range of physical activities such as badminton, gymnastics and table-tennis);

- |     |   |           |
|-----|---|-----------|
| (l) | multi-purpose area;   | 1         |
| (m) | basketball courts (including one on ground level and one at the rooftop of the assembly block); | 2         |
| (n) | green corner <sup>1</sup> ;   | 1         |
| (o) | ancillary accommodation including a lift and relevant facilities for the handicapped; and       | Available |

**Shared facilities**

- (p) a mini-soccer pitch cum sports field (to be shared by the two secondary schools under each project).

The four proposed schools will all meet the planning target of providing two square metres of open space per student. Site plans for the schools are at Enclosures 1 and 2. D Arch S plans to start construction works for **241ES** and **242ES** in December 2001 for completion in July 2003.

**JUSTIFICATION**

4. 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. **241ES** and **242ES**, together with **232ES**, **233ES**, **239ES** and **240ES**, to be considered by Members at

/this .....

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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.

this meeting (see papers referenced PWSC(2001-02)58 and PWSC(2001-02)59) will provide a total of 240 classrooms. We plan to meet the projected shortfall in future through further school construction projects.

## FINANCIAL IMPLICATIONS

5 We estimate the capital cost of **241ES**, and **242ES** to be \$223.0 million and \$218.2 million respectively in MOD prices (see paragraph 6 below), made up as follows -

	\$ million 241ES			\$ million 242ES			
	School 1	School 2	Total	School 1	School 2	Total	
(a) Site formation	-	-	-	5.0	1.3	6.3	(in September 2001 prices)
(b) Piling	16.2	16.2	32.4	11.0	11.0	22.0	
(c) Building	54.9	54.9	109.8	55.4	55.4	110.8	
(d) Building services	18.5	18.5	37.0	18.5	18.5	37.0	
(e) Drainage and external works	11.5	11.5	23.0	10.9	10.9	21.8	
(f) Contingencies	10.1	10.1	20.2	10.0	9.7	19.7	
Sub-total	111.2	111.2	222.4	110.8	106.8	217.6	
(g) Provisions for price adjustment	0.3	0.3	0.6	0.3	0.3	0.6	(in MOD prices)
Total	111.5	111.5	223.0	111.1	107.1	218.2	

The construction floor area (CFA) for each school under **241ES** and **242ES** is 12 238 square metres. The construction unit cost of each school under **241ES** and **242ES**, represented by building and building services costs, is \$5,998 per square metre of CFA and \$6,039 per square metre of CFA respectively in September 2001 prices. 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 30-classroom secondary school based on an uncomplicated site with no unusual environmental or geotechnical constraints with the estimated costs for **241ES** and **242ES** is at Enclosure 3.

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

Year	\$ million (September 2001)						Price adjustment factor	\$ million (MOD)					
	241ES			242ES				241ES			242ES		
	Sch 1	Sch 2	Total	Sch 1	Sch 2	Total		Sch 1	Sch 2	Total	Sch 1	Sch 2	Total
2001 - 02	3.0	3.0	6.0	3.0	3.0	6.0	1.00000	3.0	3.0	6.0	3.0	3.0	6.0
2002 - 03	47.3	47.3	94.6	47.1	44.5	91.6	0.99700	47.2	47.2	94.4	47.0	44.4	91.4
2003 - 04	48.3	48.3	96.6	48.1	46.9	95.0	1.00398	48.5	48.5	97.0	48.3	47.1	95.4
2004 - 05	9.6	9.6	19.2	9.6	9.4	19.0	1.01101	9.7	9.7	19.4	9.7	9.5	19.2
2005 - 06	3.0	3.0	6.0	3.0	3.0	6.0	1.01808	3.1	3.1	6.2	3.1	3.1	6.2
	111.2	111.2	222.4	110.8	106.8	217.6		111.5	111.5	223.0	111.1	107.1	218.2

7. 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 for **241ES** and **242ES** through two fixed-price lump-sum contracts respectively 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<sup>2</sup> for **241ES** and **242ES**, estimated to be \$9.4 million for each school, will be borne by the school sponsors in accordance with the established practice.

9. We estimate the annual recurrent expenditure for each school under **241ES** and **242ES** to be \$40.9 million.

## PUBLIC CONSULTATION

10. We consulted the Kowloon City District Council on **241ES** and the Kwun Tong District Council on **242ES** in April 2001. Members of the District Councils supported the projects.

/ENVIRONMENTAL .....

## ENVIRONMENTAL IMPLICATIONS

<sup>2</sup> Based on a standard furniture and equipment list prepared by Education Department for "Year 2000 design" school.

11. We conducted Preliminary Environmental Reviews (PERs) for 241ES and 242ES in March 2001. 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 2001 prices)</b>
<b>241ES</b>	(a) Construction of a 2-metre high solid boundary wall around the site boundary	2.0
<b>241ES</b> (School 1)	(b) Provision of insulated windows and air-conditioning to 30 classrooms and one small group teaching room from 1/F to 6/F at the western façade of the classroom block; 11 special rooms and one small group teaching room from 1/F to 6/F at the northern, eastern and southern façades of the special room block; as well as one small group teaching room and one multi-purpose room at southern and eastern façades of the assembly hall block	4.2
<b>241ES</b> (School 2)	(c) Provision of insulated windows and air-conditioning to 30 classrooms and one small group teaching room from 1/F to 6/F at the north-eastern façade of the classroom block; 11 special rooms from 1/F to 6/F at the eastern and southern façades of the special room block; as well as one small group teaching room and one multi-purpose room at north-western and south-western façades of the assembly hall block	4.2
<b>242ES</b>	(d) Construction of a 3-metre high solid boundary wall along the south-eastern side of the site	0.8
<b>242ES</b> (School 1)	(e) Provision of insulated windows and air-conditioning to 30 classrooms and one small group teaching room from 1/F to 6/F	4.2

/242ES .....

Project no.	Mitigation measures	Estimated cost \$ million (in Sept 2001 prices)
242ES (School 2)	<p>at the north-western façade of the classroom block; 11 special rooms from 1/F to 6/F at the south-eastern and north-eastern façades of the special room block; as well as one small group teaching room and one multi-purpose room at the south-western and south-eastern façades of the assembly hall block</p> <p>(f) Provision of insulated windows and air-conditioning to 30 classrooms and one small group teaching room from 1/F to 6/F at the north-eastern façade of the classroom block; 11 special rooms from 1/F to 6/F at the north-western and south-western façades of the special room block; as well as one small group teaching room and one multi-purpose room at south-eastern and south-western façades of the assembly hall block</p>	4.2

We have included the costs of these mitigation measures in the project estimates for the schools concerned as part of the building services works or drainage and external works.

12. The site for **242ES** is located close to the Jordan Valley Landfill. D Arch S has engaged a consultant to prepare a Risk Assessment for landfill emission and will provide suitable protection measures in the building design to avoid potential hazard associated with the landfill emission as recommended by the consultant and agreed by the Director of Environmental Protection. The estimated cost for implementing such measures is \$1 million. We have included the cost of these protection measures as part of the building works in the project estimate for **242ES**.

/13. ....

13. 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.

14. 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.

15. 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 each school will generate about 3 250 cubic metres (m<sup>3</sup>) of C&D materials. Of these, we will reuse about 2 100 m<sup>3</sup> (64.6%) on site, 650 m<sup>3</sup> (20%) as fill in public filling areas<sup>3</sup>, and dispose of 500 m<sup>3</sup> (15.4%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be \$62,500 for each school (based on a notional unit cost<sup>4</sup> of \$125/m<sup>3</sup>).

/LAND .....

## LAND ACQUISITION

16. Both **241ES** and **242ES** do not require land acquisition.

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<sup>3</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>4</sup> 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<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.



**BACKGROUND INFORMATION**

17. We upgraded **241ES** and **242ES** to Category B in August 2001. We engaged consultants to carry out PERs and topographical surveys and employed term contractors to carry out site investigations for the two projects at the following dates and costs -

<b>Project no.</b>	<b>PER</b>	<b>Topographical survey</b>	<b>Site investigation</b>	<b>Total cost</b>
<b>241ES</b>	March 2001	April 2001	April 2001	\$1.58 million
<b>242ES</b>	March 2001	February 2001	April 2001	\$2.28 million

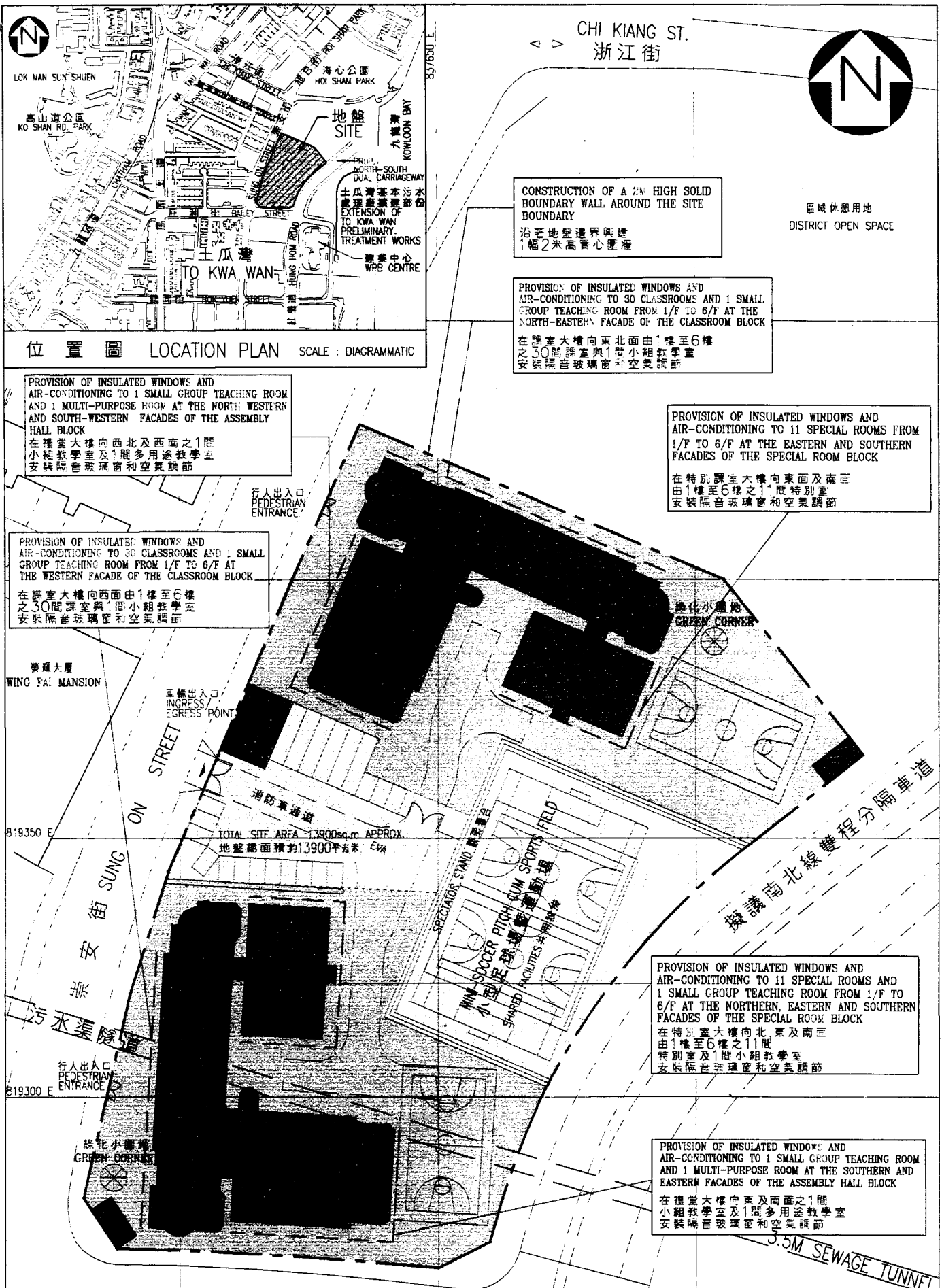
We charged these amounts to block allocation **Subhead 3100GX** "Project feasibility studies, minor investigations and consultants' fees for items in Category D of the Public Works Programme". The consultants and the term contractors have completed the PERs, topographical surveys and site investigations respectively. D Arch S has completed detailed designs and tender documents of the projects using in-house staff resources.

18. We estimate that the proposed works will create the following job opportunities during the construction period -

<b>Project no.</b>	<b>Professional staff</b>	<b>Technical staff</b>	<b>Labourer</b>	<b>Total no. of staff</b>	<b>Total man-months</b>
<b>241ES</b>	5	15	320	340	5 750
<b>242ES</b>	5	15	310	330	5 650

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Education and Manpower Bureau  
October 2001



位置圖 LOCATION PLAN SCALE: DIAGRAMMATIC

PROVISION OF INSULATED WINDOWS AND AIR-CONDITIONING TO 1 SMALL GROUP TEACHING ROOM AND 1 MULTI-PURPOSE ROOM AT THE NORTH WESTERN AND SOUTH WESTERN FACADES OF THE ASSEMBLY HALL BLOCK  
 在禮堂大樓向西北及西南之1間小組教學室及1間多用途教學室  
 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 WESTERN FACADE OF THE CLASSROOM BLOCK  
 在課室大樓向西面由1樓至6樓之30間課室與1間小組教學室  
 安裝隔音玻璃窗和空氣調節

CONSTRUCTION OF A 2M HIGH SOLID BOUNDARY WALL AROUND THE SITE BOUNDARY  
 沿著地盤邊界興建1幅2米高實心圍牆

PROVISION OF INSULATED WINDOWS AND AIR-CONDITIONING TO 30 CLASSROOMS AND 1 SMALL GROUP TEACHING ROOM FROM 1/F TO 6/F AT THE NORTH-EASTERN FACADE OF THE CLASSROOM BLOCK  
 在課室大樓向東北面由1樓至6樓之30間課室與1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 11 SPECIAL ROOMS FROM 1/F TO 6/F AT THE EASTERN AND SOUTHERN FACADES OF THE SPECIAL ROOM BLOCK  
 在特別課室大樓向東面及南面由1樓至6樓之11間特別室  
 安裝隔音玻璃窗和空氣調節

PROVISION OF INSULATED WINDOWS AND AIR-CONDITIONING TO 11 SPECIAL ROOMS AND 1 SMALL GROUP TEACHING ROOM FROM 1/F TO 6/F AT THE NORTHERN, EASTERN AND SOUTHERN FACADES OF THE SPECIAL ROOM BLOCK  
 在特別室大樓向北、東及南面由1樓至6樓之11間特別室及1間小組教學室  
 安裝隔音玻璃窗和空氣調節

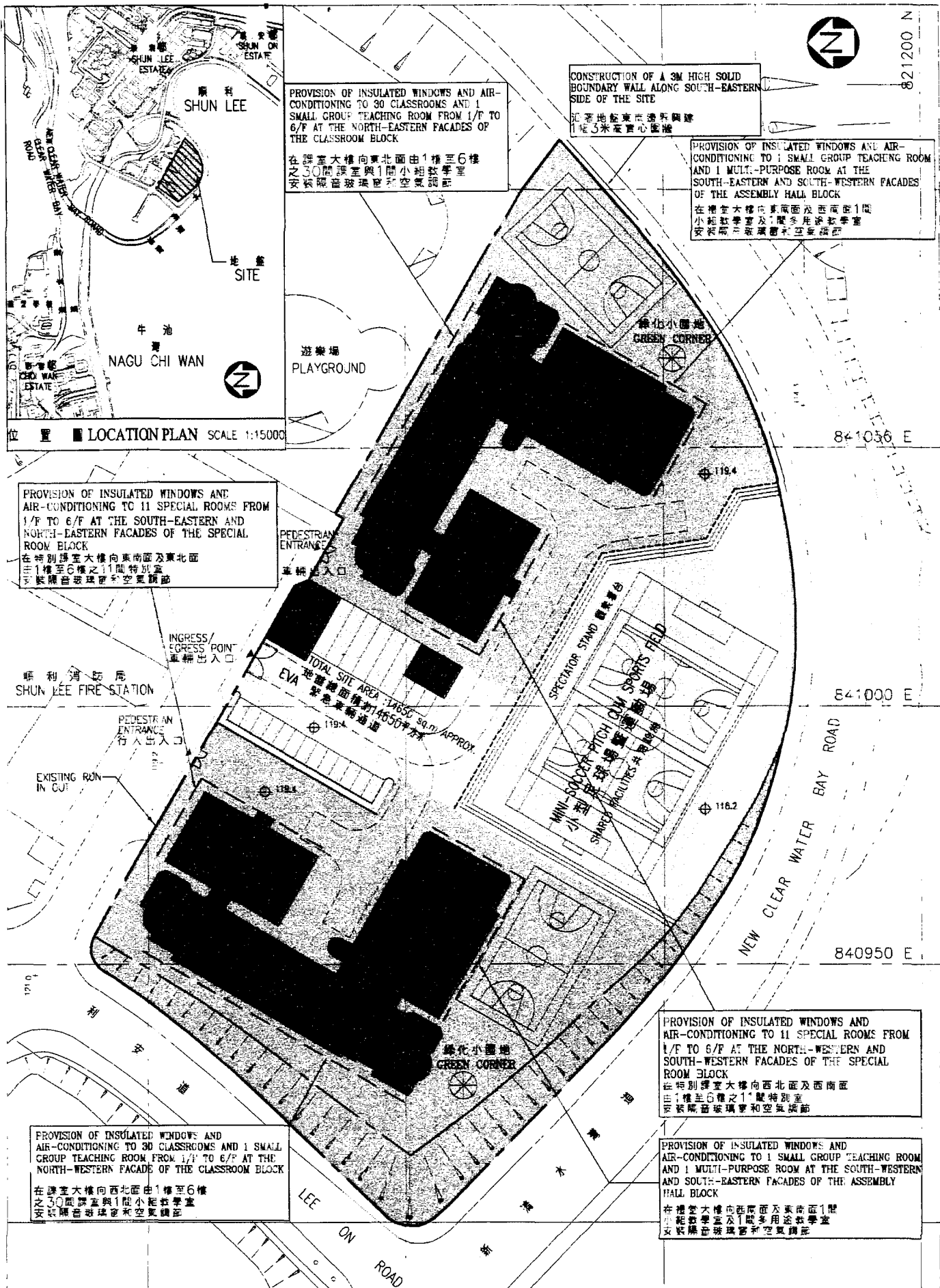
PROVISION OF INSULATED WINDOWS AND AIR-CONDITIONING TO 1 SMALL GROUP TEACHING ROOM AND 1 MULTI-PURPOSE ROOM AT THE SOUTHERN AND EASTERN FACADES OF THE ASSEMBLY HALL BLOCK  
 在禮堂大樓向東及南面之1間小組教學室及1間多用途教學室  
 安裝隔音玻璃窗和空氣調節

title 241 ES  
 土瓜灣填海區2所中學  
 TWO SECONDARY SCHOOLS IN TO KWA WAN RECLAMATION

drawn by W.H.NG  
 approved SUZANNA  
 office ARCHITECTURAL BRANCH  
 date 13/3/01  
 date 16/10/00

drawing no. AB/5802/XE101  
 scale 1:1000  
 ARCHITECTURAL SERVICES DEPARTMENT

CAD Ref. C:\5802XE101.dwg -1:1000



PROVISION OF INSULATED WINDOWS AND AIR-CONDITIONING TO 30 CLASSROOMS AND 1 SMALL GROUP TEACHING ROOM FROM 1/F TO 6/F AT THE NORTH-EASTERN FACADES OF THE CLASSROOM BLOCK  
 在課室大樓向東北面由1樓至6樓之30間課室與1間小組教學室安裝隔音玻璃窗和空氣調節

CONSTRUCTION OF A 3M HIGH SOLID BOUNDARY WALL ALONG SOUTH-EASTERN SIDE OF THE SITE  
 沿著地盤東南邊界興建1條3米高實心圍牆

PROVISION OF INSULATED WINDOWS AND AIR-CONDITIONING TO 1 SMALL GROUP TEACHING ROOM AND 1 MULTI-PURPOSE ROOM AT THE SOUTH-EASTERN AND SOUTH-WESTERN FACADES OF THE ASSEMBLY HALL BLOCK  
 在禮堂大樓向東南面及西南面1間小組教學室及1間多用途教學室安裝隔音玻璃窗和空氣調節

PROVISION OF INSULATED WINDOWS AND AIR-CONDITIONING TO 11 SPECIAL ROOMS FROM 1/F TO 6/F AT THE SOUTH-EASTERN AND NORTH-EASTERN FACADES OF THE SPECIAL ROOM BLOCK  
 在特別課室大樓向東南面及東北面由1樓至6樓之11間特別室安裝隔音玻璃窗和空氣調節

PROVISION OF INSULATED WINDOWS AND AIR-CONDITIONING TO 11 SPECIAL ROOMS FROM 1/F TO 6/F AT THE NORTH-WESTERN AND SOUTH-WESTERN FACADES OF THE SPECIAL ROOM BLOCK  
 在特別課室大樓向西北面及西南面由1樓至6樓之11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 NORTH-WESTERN FACADES OF THE CLASSROOM BLOCK  
 在課室大樓向西北面由1樓至6樓之30間課室與1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 SMALL GROUP TEACHING ROOM AND 1 MULTI-PURPOSE ROOM AT THE SOUTH-WESTERN AND SOUTH-EASTERN FACADES OF THE ASSEMBLY HALL BLOCK  
 在禮堂大樓向西南面及東南面1間小組教學室及1間多用途教學室安裝隔音玻璃窗和空氣調節

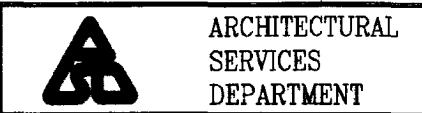
位置 LOCATION PLAN SCALE 1:15000

TOTAL SITE AREA 14855 sq.m APPROX.  
 地盤總面積約14855平方米

title 242 ES  
 觀塘利安道2所中學  
 TWO SECONDARY SCHOOLS AT LEE ON ROAD, KWUN TONG

drawn by W.H.NG date 13/3/2001  
 approved SUZANNA CHAN date 22/9/2000  
 office ARCHITECTURAL BRANCH

drawing no. AB/6384/XA101 scale 1:1000



CAD Ref. D:\6384\m101h.dwg -- 1:1000

**A comparison of the reference cost of  
a secondary school project  
with the estimated cost of 241ES and 242ES**

**\$ million (in Sept 2001 prices)**

	Reference cost*	241ES		242ES		
		School 1	School 2	School 1	School 2	
(a) Site formation	-	-	-	5.0	1.3	(See note A)
(b) Piling	11.0	16.2	16.2	11.0	11.0	(See note B)
(c) Building	54.9	54.9	54.9	55.4	55.4	(See note C)
(d) Building services	14.3	18.5	18.5	18.5	18.5	(See note D)
(e) Drainage and external works	10.5	11.5	11.5	10.9	10.9	(See note E)
(f) Contingencies	9.0	10.1	10.1	10.0	9.7	
Total	<u>99.7</u>	<u>111.2</u>	<u>111.2</u>	<u>110.8</u>	<u>106.8</u>	
(g) Construction floor area	12 238m <sup>2</sup>	12 238m <sup>2</sup>	12 238m <sup>2</sup>	12 238m <sup>2</sup>	12 238m <sup>2</sup>	
(h) Construction unit cost {[(c) + (d)] ÷ (g)}	\$5,655/m <sup>2</sup>	\$5,998/m <sup>2</sup>	\$5,998/m <sup>2</sup>	\$6,039/m <sup>2</sup>	\$6,039/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 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 both schools under **242ES**, site formation cost is necessary for leveling off the site, to carry out slope stabilization and to construct retaining structures.
- B. For both schools under **241ES**, the piling cost is higher because it is based on the use of 155 numbers of steel H-piles at an average depth of 55 metres for each school instead of 138 numbers of steel H-piles at an average depth of 30 metres assumed for the reference cost. Additional and longer piles are required as the site is on reclaimed land and the rock head level is deeper.
- C. For both schools under **242ES**, the building cost is higher because of the inclusion of \$0.5 million for each school for protection measures in the building design to avoid any potential hazard associated with landfill emission.
- D. For both **241ES** and **242ES**, the building services cost is higher because of the provision of air-conditioning as a noise mitigation measure.
- E. For both schools under **241ES**, the drainage and external works costs are higher because of the construction of a 2-metre high solid boundary wall as a noise mitigation measure.

For both schools under **242ES**, the drainage and external works costs are higher because of the construction of a 3-metre high solid boundary wall as a noise mitigation measure.