For discussion
on 13 June 2001

PWSC(2001-02)48

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 703 - BUILDINGS
Education - Primary
272EP - Primary school in Area 56, Tuen Mun
288EP - Primary school in Ma Wan, Tsuen Wan

Members are invited to recommend to Finance Committee the upgrading of **272EP** and **288EP** to Category A at an estimated cost of $91.6 million and $110.6 million respectively in money-of-the-day prices for the construction of two 30-classroom primary schools in Tuen Mun and Tsuen Wan respectively.

PROBLEM

We need to provide additional primary schools for the implementation of 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, proposes to upgrade the following projects to Category A at an estimated total cost of $202.2 million in money-of-the-day (MOD) prices -

/(a) …..

			Project Estimate $ million (MOD)
(a)	**272EP -**	Primary school in Area 56, Tuen Mun	91.6
(b)	**288EP -**	Primary school in Ma Wan, Tsuen Wan	110.6
		Total	202.2

PROJECT SCOPE AND NATURE

3. The proposed projects are for the construction of two 30-classroom primary schools. Both will adopt tailor-made non-standard designs to suit the special conditions of the sites concerned. Each school will have the following facilities -

(a) 30 classrooms;

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

(c) four remedial teaching rooms;

(d) a guidance activity room;

(e) two interview rooms;

(f) a staff room and a staff common room;

(g) a student activity centre;

(h) a conference room;

(i) a library;

(j) 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);

(k) a multi-purpose area;

/(l) …..

(l) three basketball courts (inclusive of two on ground level and a further one at the rooftop of the assembly hall block);

(m) ancillary accommodation including a lift and relevant facilities for the handicapped; and

(n) a green corner[1].

In addition, both schools will have their own spectator stands adjacent to the basketball courts on the ground level. The proposed projects will be able to meet the planning target of providing two square metres of open space per student. The site plans for the schools are at Enclosures 1 and 2. D Arch S plans to start the construction works in December 2001 for completion in July 2003.

JUSTIFICATION

4. The Government's interim target is to enable 60% of our primary school students to study in whole-day schools in 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, 39 schools have already been completed, and the remaining 39 are at various stages of construction.

5. 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, eight new schools have already been put to this Committee for consideration. **272EP** and **288EP** will further help achieve this policy target.

6. The Tuen Mun District, in which **272EP** is located, currently has 34 public sector primary schools providing 838 classrooms. D of E forecasts that an additional 98 classrooms will be required for full implementation of whole-day primary schooling by the 2007/08 school year. **272EP** will help reduce the shortfall by 30 classrooms to 68 and will enable an existing bi-sessional primary school to convert into whole-day operation. The remaining shortfall will be met by other projects under planning.

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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.

7. The Tsuen Wan District, in which **288EP** is located, currently has 21 public sector primary schools providing 436 classrooms. D of E forecasts that an additional 125 classrooms will be required for full implementation of whole-day primary schooling by the 2007/08 school year. **288EP** will help reduce the shortfall by 30 classrooms to 95 and will enable an existing bi-sessional primary school to convert into whole-day operation. The remaining shortfall will be met by other projects under planning.

FINANCIAL IMPLICATIONS

8. We estimate the capital costs of **272EP** and **288EP** to be $91.6 million and $110.6 million respectively in MOD prices (see paragraph 9 below), made up as follows -

		$ million		
		272EP	**288EP**	
(a)	Site formation	1.0	-	
(b)	Slope works	2.6	5.0	
(c)	Piling	4.8	10.0	
(d)	Building	51.5	59.2	
(e)	Building services	11.5	14.8	
(f)	Drainage and external works	9.0	9.0	
(g)	Furniture and equipment	4.5	4.5	
(h)	Contingencies	8.0	9.8	
	Sub-total	92.9	112.3	(in September 2000 prices)
(i)	Provision for price adjustment	(1.3)	(1.7)	
	Total	91.6	110.6	(in MOD prices)

/The …..

The construction floor area (CFA) of the school under **272EP** is 11 450 square metres whereas that under **288EP** is 13 900 square metres. The construction unit costs of **272EP** and **288EP**, represented by the building and the building services costs, are $5,502 per square metre of CFA and $5,324 per square metre of CFA respectively in September 2000 prices. D Arch S considers these comparable to similar school projects built by the Government. A comparison of the reference cost for a 30-classroom primary school based on an uncomplicated site with no unusual environmental or geotechnical constraints with the estimated costs for the two projects is at Enclosure 3.

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

Year	$ million (Sept 2000)		Price adjustment factor	$ million (MOD)	
	272EP	**288EP**		**272EP**	**288EP**
2001 - 02	2.0	2.0	0.98000	2.0	2.0
2002 - 03	40.7	48.3	0.97976	39.9	47.3
2003 - 04	39.7	47.9	0.98759	39.2	47.3
2004 - 05	8.5	12.1	0.99549	8.5	12.0
2005 - 06	2.0	2.0	1.00346	2.0	2.0
	92.9	112.3		91.6	110.6

10. 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 tender the proposed works under fixed-price lump-sum contracts 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.

11. For each school, the cost of furniture and equipment will be borne by the Government as the schools will enable two existing bi-sessional schools to convert into whole-day operation. This is in line with existing policy.

/12. …..

12. We estimate the annually recurrent expenditure for each school to be $23.1 million.

PUBLIC CONSULTATION

13. We consulted the Tuen Mun District Council on **272EP** in January 2000 and Tsuen Wan District Council on **288EP** in November 2000. Members of the District Councils supported the projects.

ENVIRONMENTAL IMPLICATIONS

14. We engaged consultants to conduct Preliminary Environmental Reviews (PERs) for **272EP** in December 1998 and for **288EP** in February 2000. The PERs concluded that both schools would not be subject to adverse environmental impacts.

15. 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.

16. 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 avoid temporary formwork and construction waste. These include dry-wall partitioning and proprietary fittings and fixtures. Suitable excavated materials will be used for filling within the site to minimise off-site disposal. In addition, the contractor will be required to use metal site hoardings and signboards so that these materials can be recycled or reused in other projects.

17. D Arch S will also require the contractor 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 project will generate some 2 750 cubic metres (m^3) of C&D materials. Of these, we will reuse about 1 850 m^3 (67.3%) on site, 400 m^3 (14.5%) as fill in public filling areas[2], and dispose of 500 m^3 (18.2%) at landfills.

LAND ACQUISITION

18. The two projects do not require land acquisition.

BACKGROUND INFORMATION

19. We upgraded **272EP** and **288EP** to Category B in September 2000 and October 2000 respectively. We engaged consultants to carry out PERs and employed term contractors to carry out site investigations for the two projects at the following dates and costs -

Project No.	PER	Site investigation	Total cost
272EP	December 1998	May 1997	$680,000
288EP	February 2000	October 2000	$785,000

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 and site investigations respectively. D Arch S has completed detailed designs of the projects and is preparing the tender documents using in-house staff resources.

20. We estimate that **272EP** and **288EP** will create the following job opportunities -

/**Project** …..

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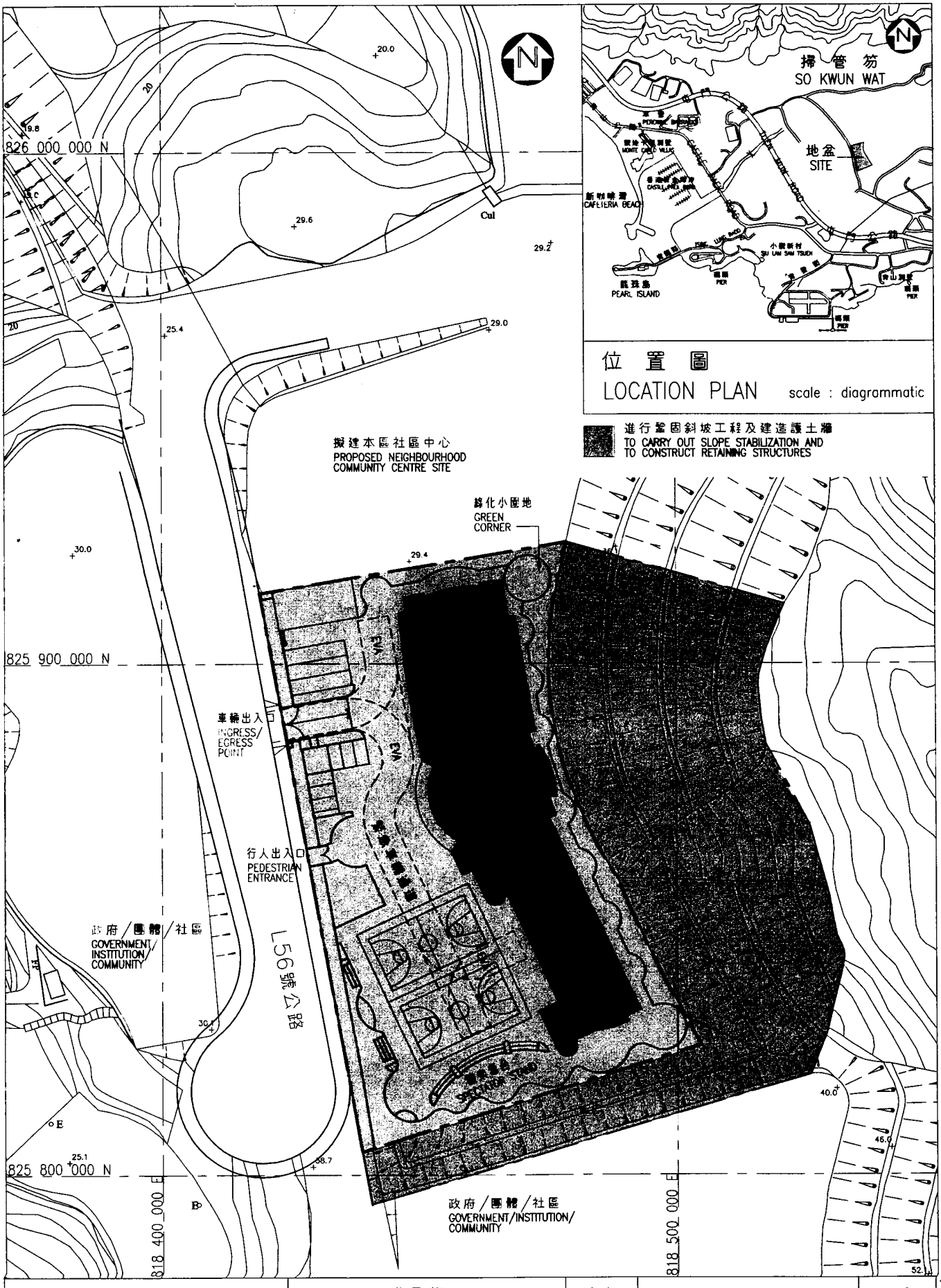
[2] A public filling area is a designated part of a development project that accepts public fill for reclamation purposes. Disposal of public fill in a public filling area requires a licence issued by the Director of Civil Engineering.

Project No.	Professional Staff	Technical Staff	Labourer	Total no. of staff	Total Man-months
272EP	3	7	125	135	2 300
288EP	3	7	155	165	2 840

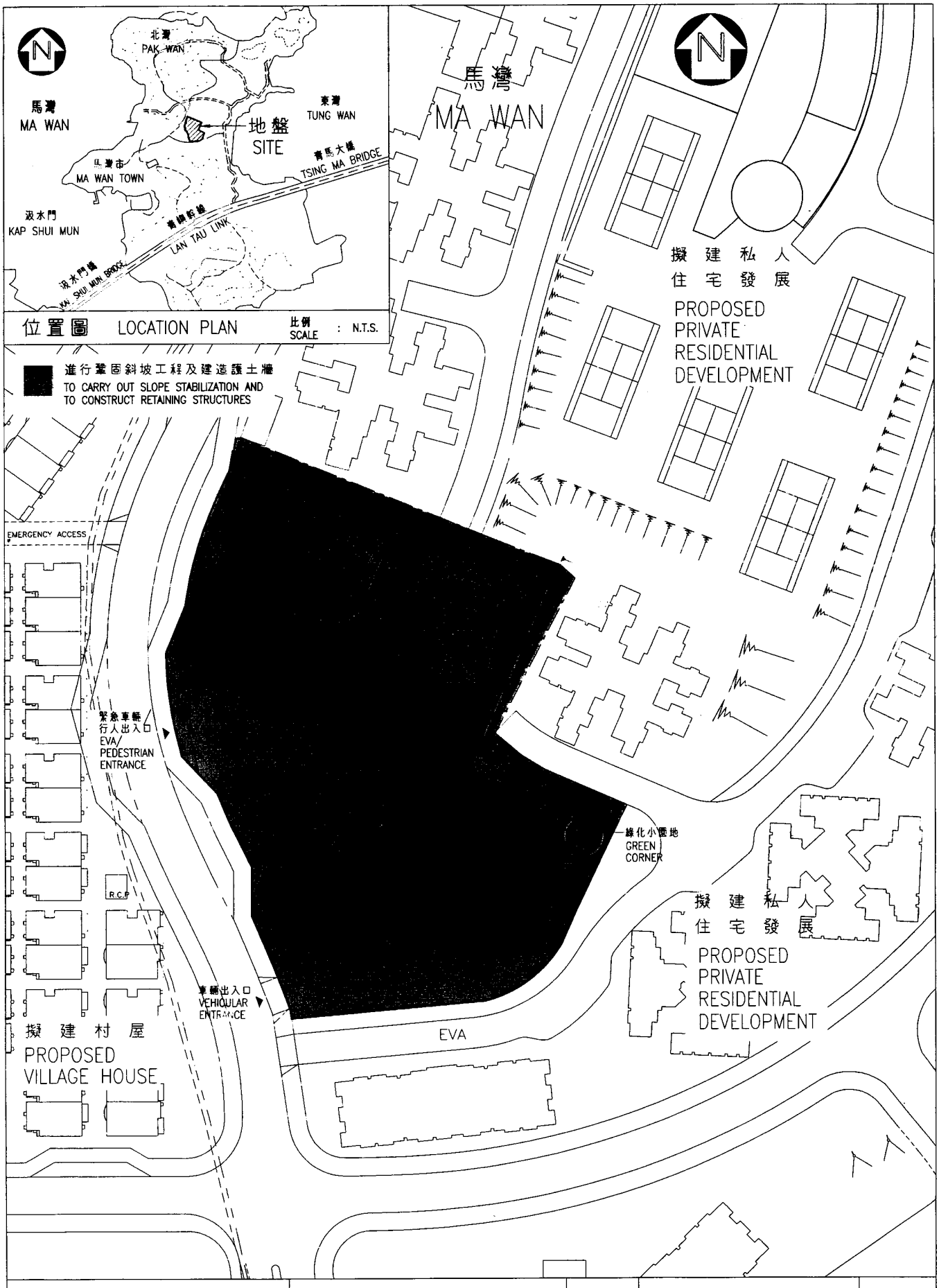
Education and Manpower Bureau
June 2001



title 272EP 屯門第56區 1所小學 PRIMARY SCHOOL IN AREA 56, TUEN MUN	drawn by 曹子超 C.C. CHO 梁宇清 ANNA Y.C. LEUNG	date 29.05.01	drawing no. AB/5693/XG103	scale 1:1000
	approved 莫英傑 PETER Y.K. MOK	date 29.05.01	ARCHITECTURAL SERVICES DEPARTMENT	
	office ARCHITECTURAL BRANCH			

CAD Ref. 5693xg103b.dwg — 1:1000

位置圖 LOCATION PLAN 比例 SCALE : N.T.S.



title 288EP 荃灣馬灣1所小學 PRIMARY SCHOOL IN MA WAN, TSUEN WAN	drawn by P.Y. LAI, EMIL CHOI	date 02/2001	drawing no. AB/5692/XE101	scale 1:1000
	approved ANDREW SUNG	date 02/2001		
	office ARCHITECTURAL BRANCH		ARCHITECTURAL SERVICES DEPARTMENT	

CAD Ref. XD101--1:1000

A comparison of the reference cost of a 30-classroom primary school project with the estimated costs of 272EP and 288EP

$ million (in Sept 2000 prices)

	Reference cost*	**272EP**	**288EP**	
(a) Site formation	-	1.0	-	(See note A)
(b) Slope works	-	2.6	5.0	(See note B)
(c) Piling	9.0	4.8	10.0	(See note C)
(d) Building	49.5	51.5	59.2	(See note D)
(e) Building services	11.5	11.5	14.8	(See note E)
(f) Drainage and external works	9.0	9.0	9.0	
(g) Furniture and equipment	-	4.5	4.5	(See note F)
(h) Contingencies	7.9	8.0	9.8	
Total	86.9	92.9	112.3	
(i) Construction floor area	10 727m^2	11 450m^2	13 900m^2	
(j) Construction unit cost {[(d)+(e)] ÷(i)}	$5,687/$m^2$	$5,502/$m^2$	$5,324/$m^2$	

*** Assumptions for reference cost**

1. The estimation is based on the assumption that the school site is uncomplicated and without abnormal 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 the handing-over of 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. For **272EP**, site formation cost is required for leveling off the site to create a platform for the school.

B. For both **272EP** and **288EP**, cost is required for carrying out slope stabilization as well as building retaining structures.

C. Instead of steel H-piles, both **272EP** and **288EP** will use rock socketed steel H-piles in prebored holes. Percussive steel H-piles are unsuitable in both cases due to the need to drive the piles through an extensive layer of boulders. Also, the piles will be driven to a shallower depth because the bedrock level is close to the surface.

The piling cost for **272EP** is lower than that of the reference cost because it is based on the use of 112 numbers of rock socketed steel H-piles in prebored holes at an average depth of 10 metres instead of 112 numbers of steel H-piles at an average depth of 30 metres. In other words, the length of the piles used is only one-third of that assumed for the reference cost.

The piling cost for **288EP** is higher because it is based on the use of 145 numbers of rock socketed steel H-piles in prebored holes at an average depth of 18 metres instead of 112 numbers of steel H-piles at an average depth of 30 metres. The larger number of piles required contributes to the higher piling cost.

D. For **272EP**, the building cost is higher because the construction floor area (11 450 m^2) is larger. Due to the narrow configuration of the site, D Arch S has adopted a tailor-made non-standard design for the school to accommodate all necessary facilities. D Arch S considers this school design the most economical one for this particular site.

For **288EP**, the building cost is higher because the construction floor area (13 900 m^2) is larger. Due to the topography and the configuration of the site, D Arch S has adopted a tailor-made non-standard design for the school to fit in with the stepped site levels. Although the proposed design entails a larger construction floor area (vis-a-vis the standard school design), it is more compatible with the surrounding environment. We have considered the option of building a standard design school. However, this option would entail substantial formation works for leveling off the site. Due to the substantial site formation cost involved, D Arch S estimates that the cost for constructing a standard design school there would be more or less the same as that for building the proposed non-standard design school. In view of the above, D Arch S considers that the proposed non-standard design is more appropriate and economical for this particular site.

E. The building services cost for **288EP** is higher due to the larger construction floor area of the school.

F. The cost of furniture and equipment for each project, estimated to be $4.5 million, will be borne by the Government as the school will be allocated to existing bi-sessional school for conversion into whole-day operation.