


MINISTRY OF EDUCATION AND TRAINING  
THE SOCIALIST REPUBLIC OF VIET NAM

NO. 1

**BASIC DESIGN STUDY REPORT  
ON  
THE PROJECT FOR IMPROVEMENT OF  
THE FACILITIES OF PRIMARY SCHOOLS  
(PHASE III)  
IN  
THE SOCIALIST REPUBLIC OF VIET NAM**

JUNE, 1996

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## PREFACE

In response to a request from the Government of the Socialist Republic of Viet Nam, the Government of Japan decided to conduct a basic design study on the Project for Improvement of the Facilities of Primary Schools (Phase III) and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Viet Nam a study team from January 9 to February 12, 1996.

The team held discussions with the officials concerned of the Government of Viet Nam, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Viet Nam in order to discuss a draft basic design, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Socialist Republic of Viet Nam for their close cooperation extended to the teams.

June, 1996



Kimio Fujita

President

Japan International Cooperation Agency

June, 1996

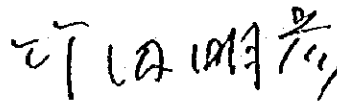
### Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Improvement of the Facilities of Primary Schools (Phase III) in the Socialist Republic of Viet Nam.

This study was conducted by Matsuda Consultants International Co., Ltd. and Katahira & Engineers International, under a contract to JICA, during the period from January 5, 1996 to July 4, 1996. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Viet Nam and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,



Akihiko Takeuchi

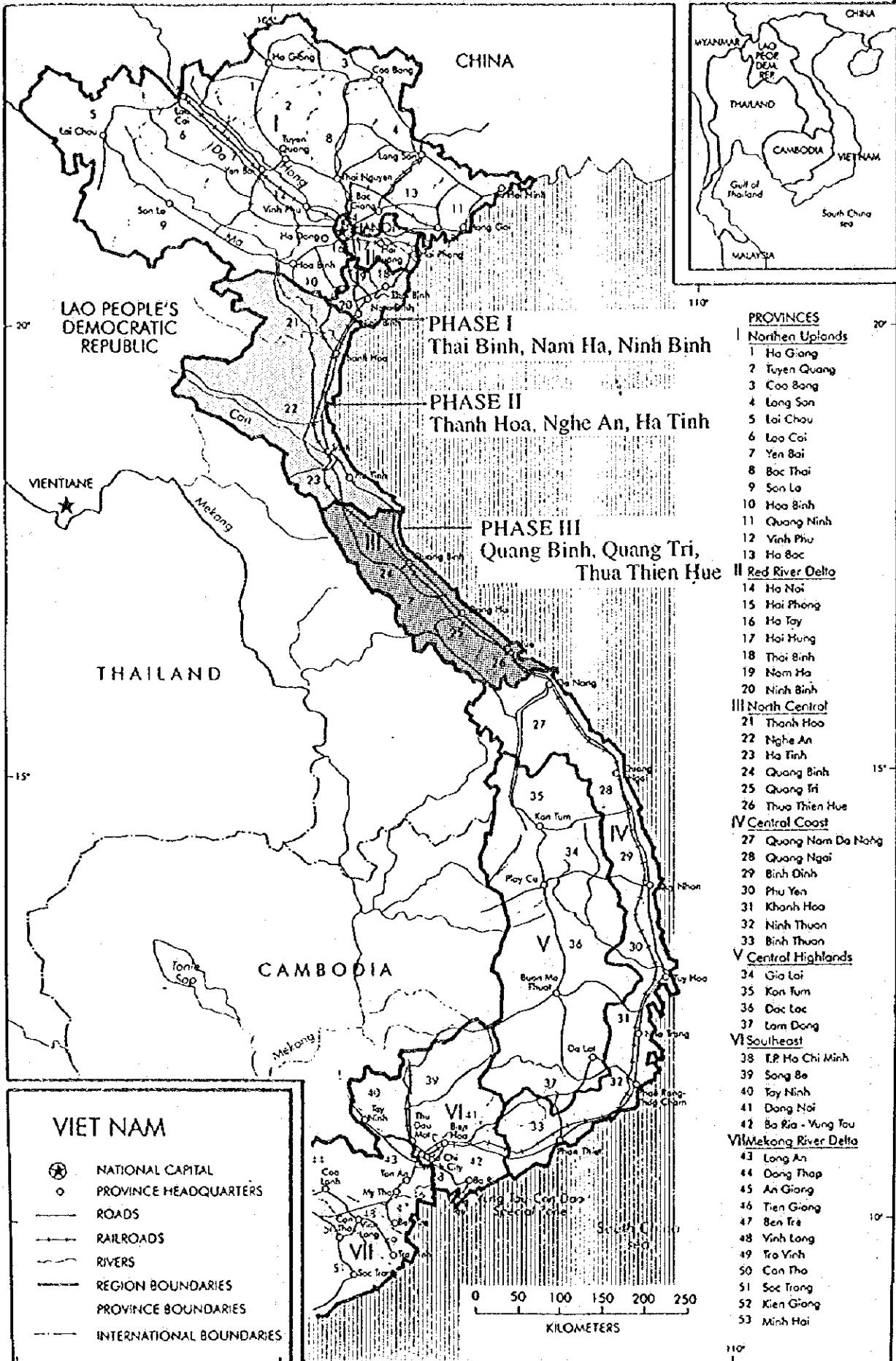
Project manager,

Basic design study team on

the Project for Improvement of the Facilities  
of Primary Schools (Phase III)

Matsuda Consultants International Co., Ltd.

# LOCATION MAP



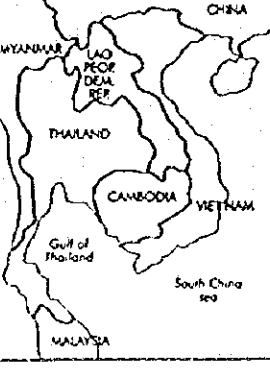
LAO PEOPLE'S  
DEMOCRATIC  
REPUBLIC

VIENTIANE

THAILAND

CAMBODIA

CHINA



**PHASE I**  
Thai Binh, Nam Ha, Ninh Binh

**PHASE II**  
Thanh Hoa, Nghe An, Ha Tinh

**PHASE III**  
Quang Binh, Quang Tri,  
Thua Thien Hue

**PROVINCES**

Northern Uplands

- 1 Ha Giang
- 2 Tuyen Quang
- 3 Cao Bang
- 4 Lang Son
- 5 Lai Chau
- 6 Lao Cai
- 7 Yen Bai
- 8 Bac Thai
- 9 Son La
- 10 Hoa Binh
- 11 Quang Ninh
- 12 Vinh Phu
- 13 Ha Bac

Red River Delta

- 14 Ho Nai
- 15 Hai Phong
- 16 Ha Tay
- 17 Hai Hung
- 18 Thai Binh
- 19 Nam Ha
- 20 Ninh Binh

North Central

- 21 Thanh Hoa
- 22 Nghe An
- 23 Ha Tinh
- 24 Quang Binh
- 25 Quang Tri
- 26 Thua Thien Hue

Central Coast

- 27 Quang Nam Da Nang
- 28 Quang Ngai
- 29 Binh Dinh
- 30 Phu Yen
- 31 Khanh Hoa
- 32 Ninh Thuan
- 33 Binh Thuan

Central Highlands

- 34 Gia Lai
- 35 Kon Tum
- 36 Dac Lac
- 37 Lam Dong

Southeast

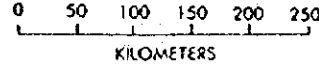
- 38 TP Ho Chi Minh
- 39 Song Be
- 40 Tay Ninh
- 41 Dong Nai
- 42 Ba Ria - Yung Tou

Mekong River Delta

- 43 Long An
- 44 Dong Thap
- 45 An Giang
- 46 Tien Giang
- 47 Ben Tre
- 48 Vinh Long
- 49 Tra Vinh
- 50 Can Tho
- 51 Soc Trang
- 52 Kien Giang
- 53 Minh Hai

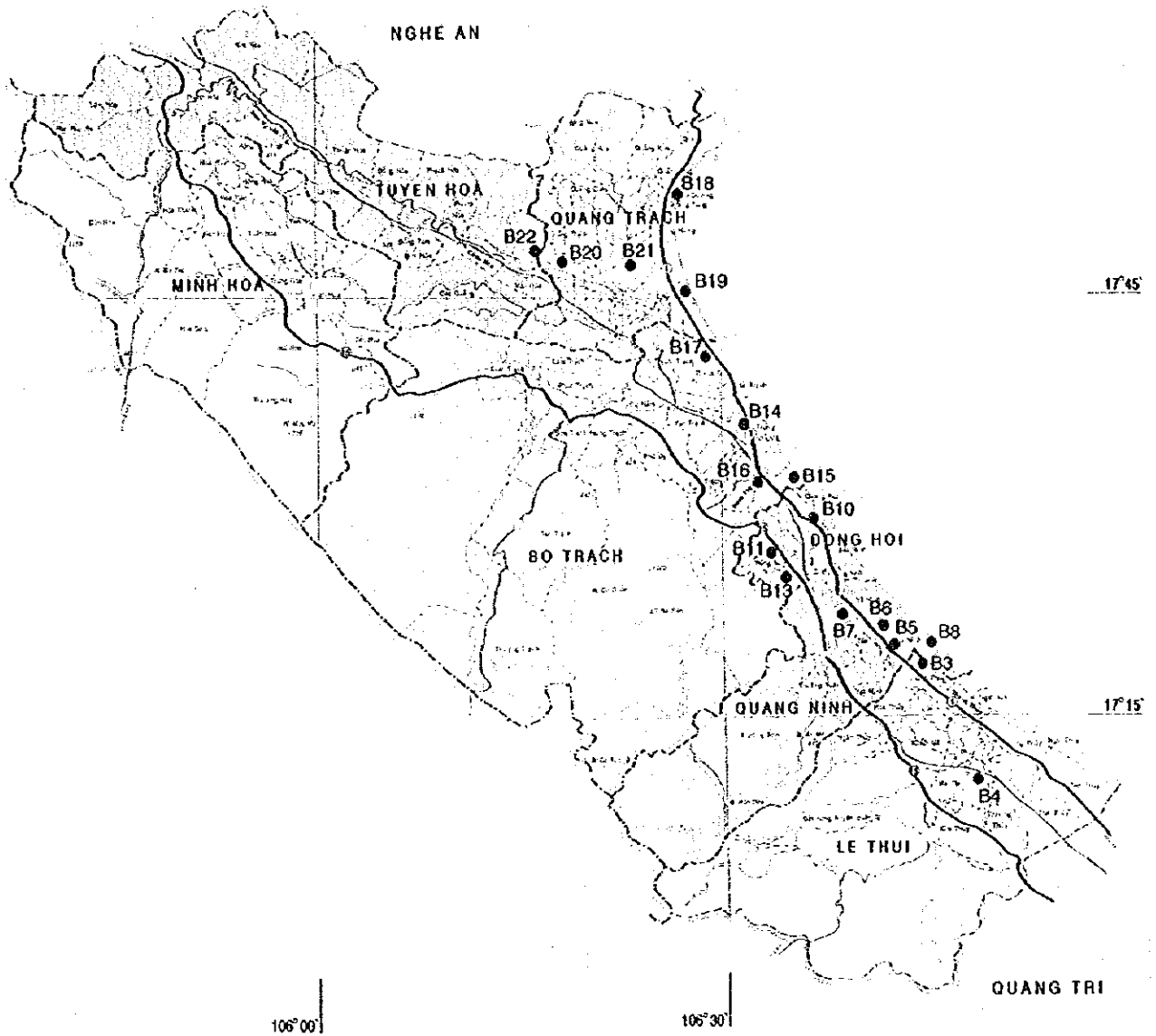
**VIET NAM**

- ⊙ NATIONAL CAPITAL
- PROVINCE HEADQUARTERS
- ROADS
- RAILROADS
- RIVERS
- REGION BOUNDARIES
- PROVINCE BOUNDARIES
- INTERNATIONAL BOUNDARIES



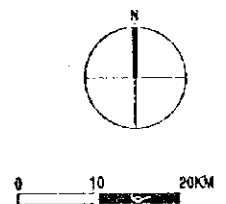


PROJECT SITE LOCATION MAP - 1/3 QUANG BINH PROVINCE

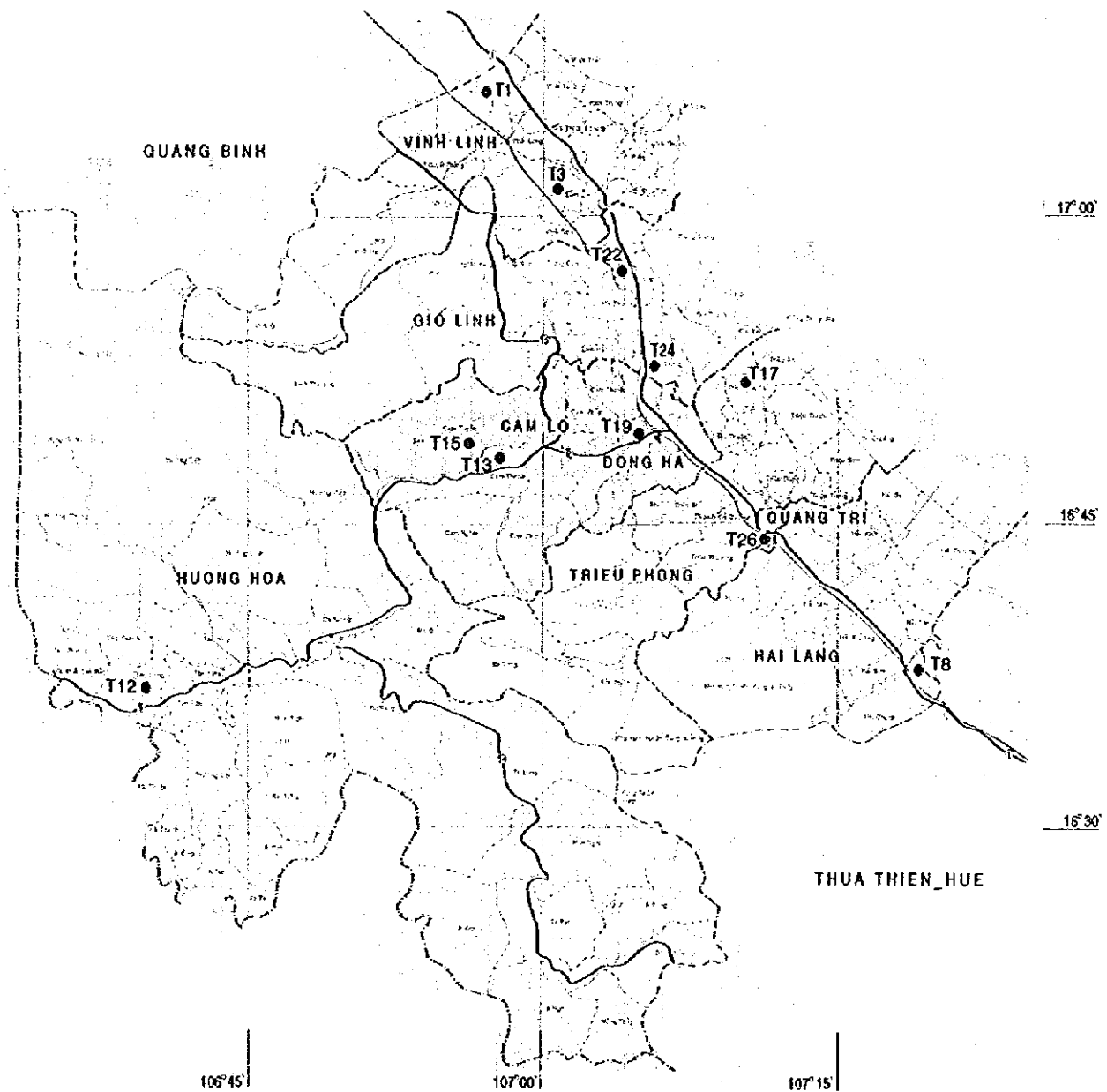


LIST OF SCHOOLS

LE THUY DISTRICT	DONG HOI CITY	QUANG TRACH DISTRICT
B3 DINH THUONG PS	B10 LOC NINH NO.1 PS	B18 CANH DUONG PS
B4 MY THUY PS	B11 DONG SON NO.1 PS	B19 QUANG THOP PS
QUANG NINH DISTRICT	B13 NGHIA NINH PS	B20 QUANG LIEN PS
B5 TAN NINH PS	BO TRACH DISTRICT	B21 QUANG PHUONG B PS
B6 GIA NINH PS	B14 HOAN LAO PS	TUYEN HOA DISTRICT
B7 HAM NINH PS	B15 NHAN TRACH PS	B22 TIEN HOA PS
B8 HAI NINH PS	B16 NAM TRACH PS	
	B17 THANH TRACH PS	

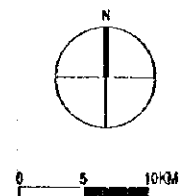


PROJECT SITE LOCATION MAP - 2/3 QUANG TRI PROVINCE

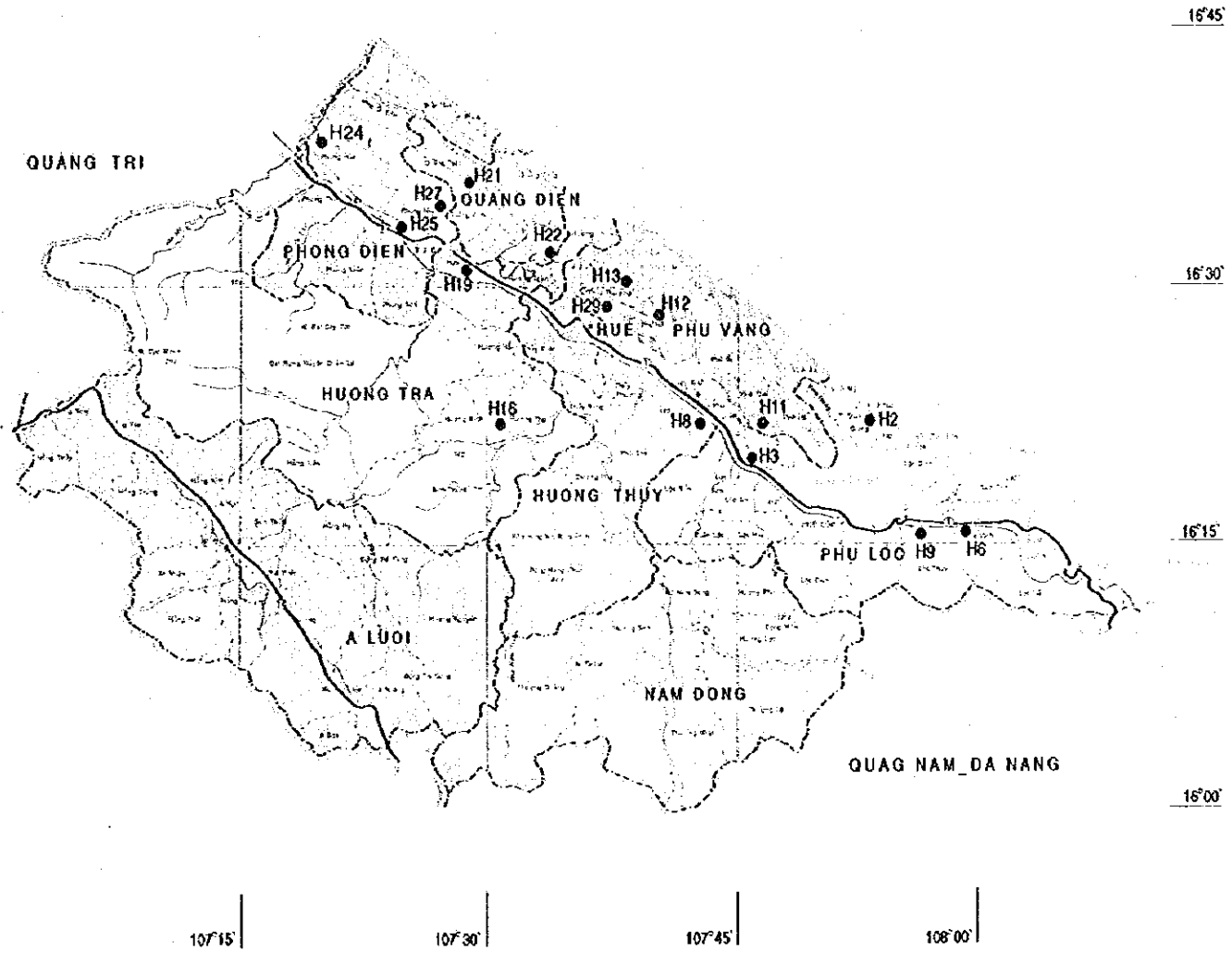


LIST OF SCHOOLS

VINH LINH DISTRICT	CAM LO DISTRICT	GIO LINH DISTRICT
T1 VINH CHAP PS	T13 CAM THANH PS	T22 GIO PHONG PS
T3 VINH LAM NO.2 PS	T15 CAM TUYEN PS	T24 GIO QUANG PS
HAI LANG DISTRICT	TRIEU PHONG DISTRICT	QUANG TRI CITY
T8 HAI CHANH PS	T17 TRIEU PHUOC PS	T26 P2 TX QUANG TRI PS
HUONG HOA DISTRICT	DONG HA CITY	
T12 TAN LONG PS	T19 DONG THANH PS	

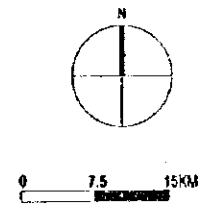


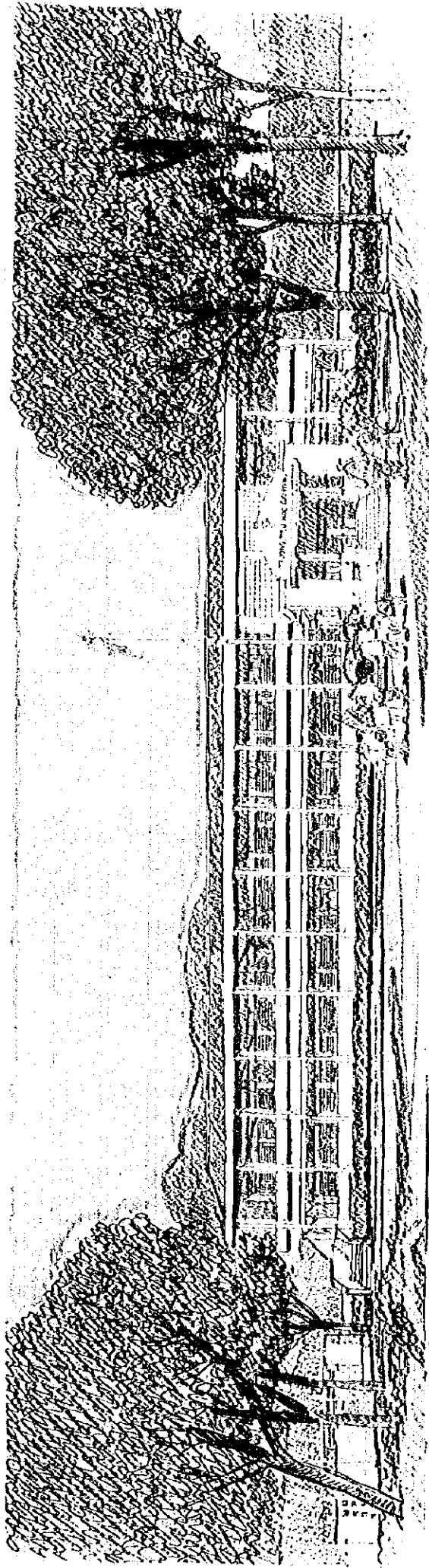
PROJECT SITE LOCATION MAP - 3/3 THUA THIEN HUE PROVINCE



LIST OF SCHOOLS

PHU LOC DISTRICT	PHU VANG DISTRICT	QUANG DIEN DISTRICT
H2 VINH MY PS	H11 VINH THAI PS	H21 QUANG LOI PS
H3 AN NONG PS	H12 PHU MY NO.1 PS	H22 QUANG THANH PS
H6 NUOC NGOT PS	H13 PHU AN NO.2 PS	PHONG DIEN DISTRICT
H9 LOC TRI PS	HUONG TRA DISTRICT	H24 UN DIEN PS
HUONG THUY DISTRICT	H16 BINH DIEN PS	H25 DIEN AN PS
H8 THUY PHU NO.2 PS	H19 HUONG VAN NO.1 PS	H27 TAY HIEN PS
H29 THUY VAN NO.1 PS		





THE PROJECT FOR THE IMPROVEMENT OF THE FACILITIES OF PRIMARY SCHOOLS ( PHASE 3 )  
PROPOSED PERSPECTIVE SCHOOL TYPE 10A2

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7. Reference

## **CHAPTER 1 BACKGROUND OF THE PROJECT**

## CHAPTER 1 BACKGROUND OF THE PROJECT

The Socialist Republic of Viet Nam (hereinafter referred to as Viet Nam) has a land area of 330,000 km<sup>2</sup> and a population of some 70 million. The northern part is characterised by a subtropical climate while the southern part is characterised by a tropical monsoon climate. After some 30 years of armed conflict consisting of the war of independence, the country was finally unified in 1976 as a socialist country under the leadership of the Communist Party of Viet Nam. With the adoption of the Doi Moi (reform) line in 1986, the government has been proceeding with modernisation, involving the enactment of new laws and fiscal, financial and administrative reforms, etc., to facilitate the country's shift to a market economy. The important issue at present relating to the drive towards a market economy is a qualitative improvement of education to create a new, modern labour force to support the transitional process. Since the commencement of the 5th 5-Year Plan in 1991, the fostering and consolidation of human resources for socioeconomic development has been the highest priority. The Ministry of Education and Training has introduced the slogan of "Education for All" as the key concept for Vietnam's educational policy with the concrete aim of providing primary education for all children by the year 2000.

Ordinary education in Viet Nam is principally based on the 5-4-3 system and primary education lasting for 5 years became compulsory in 1991. Although the primary school enrolment rate of 87% is fairly high (fiscal 1994/95), the many drop-outs means that the primary education completion rate is just over 70%. Primary schools are currently forced to operate two or even three shifts due to the shortage of physical facilities. In addition, many of the existing school buildings are noticeably deteriorated, forcing many schools to use or borrow temporary facilities. The Ministry of Education and Training forecasts that the number of primary school pupils and secondary school pupils will increase from 9.1 million in 1991 through 1995 to 11 million in 2000 for the former and from 2.8 million to 3.5 million for the latter during the same period. These increases will necessitate the construction of 47,580 new classrooms (for primary and secondary schools), the renewal of old buildings with a total floor area of 5,041,422 m<sup>2</sup> (equivalent to 70,600 classrooms) and the repair of classrooms with a total floor area of 4,067,230 m<sup>2</sup> (equivalent to 58,000 classrooms). (Cited from the General Long-Term Project on Consolidation and Improvement of Infrastructure for Education and Training, Ministry of Education and Training, December, 1992.)

Despite the acute need for investment in school buildings, the personnel cost accounts for 85% of Vietnam's education budget, leaving little left for the improvement of facilities and textbooks, etc. Under these circumstances, the Government of Viet Nam prepared the Primary Education Facilities Improvement Project to enlist the assistance of international aid

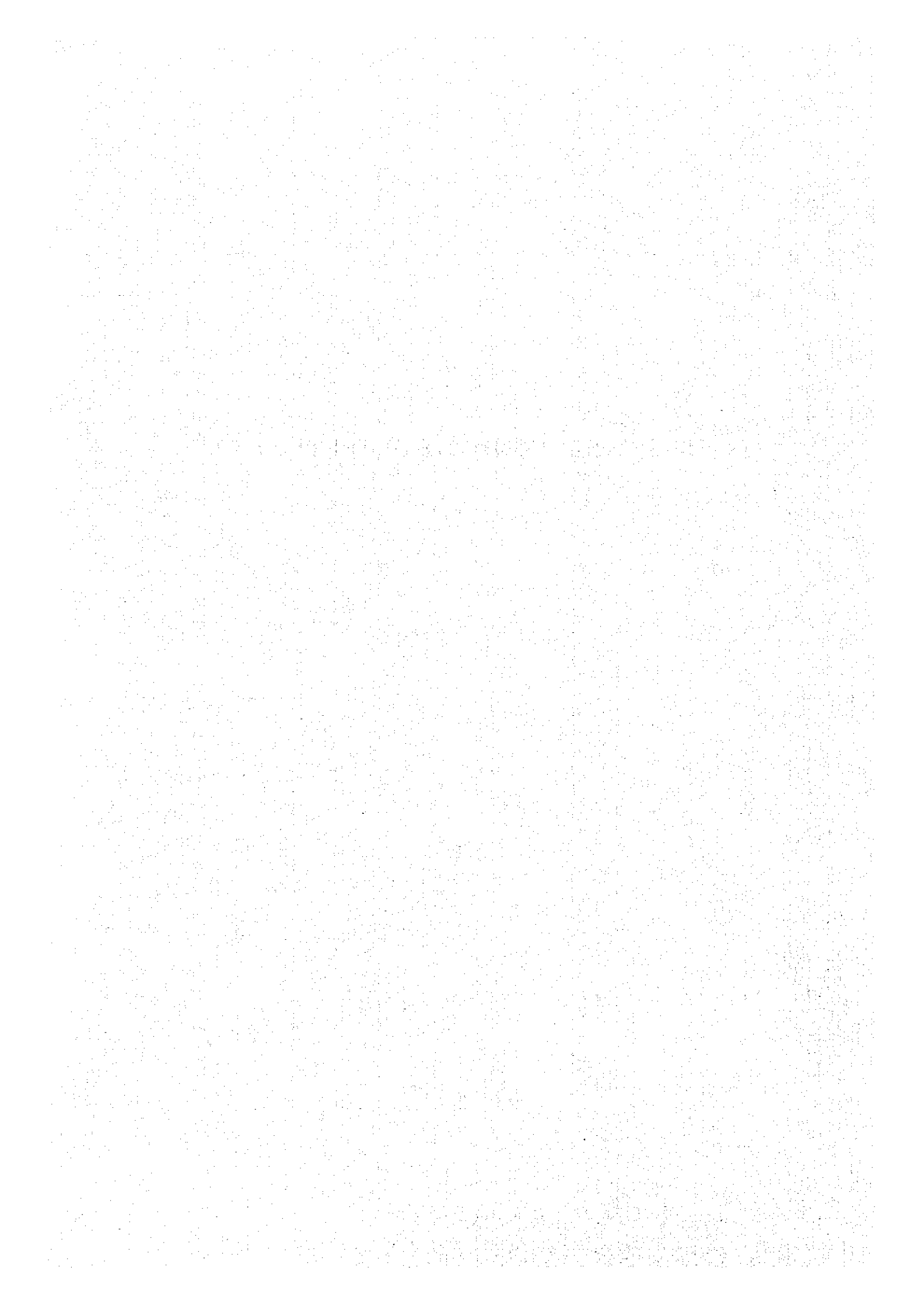
organizations and donor countries. In response, the World Bank has been implementing Primary Education projects in 5 cities, 11 provinces in the Mekong Delta and 8 mountainous provinces. In December, 1993, the Government of Viet Nam made a request to the Government of Japan for the provision of grant aid for the improvement of 610 primary schools in a total of 30 provinces which had either been badly hit by a typhoon or which were located in mountainous areas. In response to this request, the Government of Japan conducted the Phase I Project (30 schools with 348 classrooms; ¥1,446 million) in fiscal 1994 in Thai Binh, Nam Ha and Ninh Binh Provinces, followed by the Phase II Project (40 schools with 430 classrooms; ¥1,660 million) in Thanh Hoa, Nghe An and Ha Tinh Provinces in fiscal 1995. Following two phases, the Government of Viet Nam made a further request to the Government of Japan for the Phase III Grant Aid Project featuring the construction of primary school buildings in Quang Binh, Quang Tri and Thua Thien-Hue Provinces.

The contents of the request for the Phase III Project, confirmed through consultations between the Basic Design Study Team and officials of the Ministry of Education and Training, are as follows.

- (1) Facilities : construction of 18 primary schools in Quang Binh Province, 11 in Quang Tri Province and 16 in Thua Thien-Hue Province
- (2) Equipment : provision of desks, chairs, blackboards and cabinets (bookshelves), etc. for the above primary schools



## **CHAPTER 2 CONTENTS OF THE PROJECT**



## **CHAPTER 2 CONTENTS OF THE PROJECT**

### **2.1 Objectives of the Project**

In its Socioeconomic Development Strategy Upto the Year 2000 adopted by the 7th Party Congress in 1993, the Government of Viet Nam declared the fostering and consolidation of human resources to be one of the 4 main pillars of development. In the Socioeconomic Development and Investment Demands for the 5-Year Period from 1996 to 2000, which was introduced in place of the 6th 5-Year Plan, the development targets of the industrialisation and modernisation of Viet Nam have been set in order to reduce the development gap between Viet Nam and other countries in Asia. The development of education and training with the aim of fostering a new labour force and manpower is believed to be the critical basis for successful socioeconomic development. Based on this strategy, the Ministry of Education and Training has introduced the slogan of "Education for All" with the aim of achieving general primary education for all children by the year 2000 and higher educational efficiency through improvement of the educational contents and method, spread of education to ethnic minorities and people living in mountainous areas and general improvement of the educational facilities.

The improvement targets for the educational facilities are improvement of the class-classroom ratio to 1.5 and the total eradication of three-shift teaching. Other targets include the replacement of all temporary classrooms or those which have passed their expected life-span with semi-permanent or permanent new facilities and the construction of new classrooms to allow 10% of primary schools to be run on a full-time basis (with school lunch). However, the extremely tight fiscal situation of Viet Nam is making it difficult to proceed with the improvement of school facilities. The situation has been made worse by damage to the buildings due to typhoons and/or flooding while the increased number of pupils has also aggravated the classroom shortage.

The principal objective of the Project is the rebuilding and expansion of primary school facilities in 3 provinces along the central coast of Viet Nam, i.e. Quang Binh, Quang Tri and Thua Thien-Hue, all of which are characterised by extensively damaged school facilities due to typhoons and/or floods, deterioration of the same facilities over the years and a desperate shortage of classrooms in general. At the same time, the Project aims at improving the quality of the primary education of the subject schools through the provision of basic educational equipment.

### **2.2 Basic Concept of the Project**

#### **(1) Examination of Contents of the Request**

The request made by the Government of Viet Nam consists of the rebuilding of 45 primary schools in Quang Binh, Quang Tri and Thua Thien-Hue Provinces as listed

below and the provision of educational equipment, including desks, chairs and cabinets, and teaching materials for the said schools.

Quang Binh Province

	District	Name
1.	Le Thuy District	Dinh Thuong
2.		My Thuy
3.	Quang Ninh District	Tan Ninh
4.		Gia Ninh
5.		Ham Ninh
6.		Hai Ninh
7.	Dong Hoi City	Loc Ninh 1
8.		Dong Son
9.		Nghia Ninh
10.	Bo Trach District	Hoan Lao
11.		Nhan Trach
12.		Nam Trach
13.		Thanh Trach
14.	Quang Trach District	Canh Duong
15.		Quang Tho
16.		Quang Lien
17.		Quang Phuong
18.	Tuyen Hoa District	Tien Hoa

Quang Tri Province

19.	Vinh Linh District	Vinh Chap
20.		Vinh Lam 2
21.	Hai Lang District	Hai Chanh
22.	Huong Hoa District	Tan Long
23.	Cam Lo District	Cam Thanh
24.		Cam Tuyen
25.	Triau Phong District	Trieu Phuoc
26.	Dong Ha City	Dong Thanh
27.	Gio Linh District	Gio Phong
28.		Gio Quang
29.	Quang Tri City	Phuong 2 TX Quang Tri

Thua Thien-Hue Province

30.	Phu Loc District	Vinh My
31.		An Nong
32.		Loc Tri
33.		Nuoc Ngot
34.	Huong Thuy District	Thuy Phu 2
35.		Thuy Van
36.	Phu Vang District	Vinh Thai
37.		Phu My 1
38.		Phu An 2
39.	Huong Tra District	Binh Dien
40.		Huong Van 1
41.	Quang Dien District	Quang Loi
42.		Quang Thanh
43.	Phong Dien District	Uu Dien
44.		Dien An
45.		Tay Hien

**(2) Examination of Candidate Recipient Schools**

The selection of the candidate recipient schools is based on the following criteria as in the case of the Phase I and Phase II Projects.

- ① The school requires urgent rebuilding because of its high risk of collapse due to typhoon/flood damage or deterioration.
- ② The school is forced to adopt double or triple shifts because of an extreme shortage of classrooms.
- ③ The site conditions of the school do not impose any restriction on construction work.
- ④ The school is located in an urban, coastal or mountainous area, plays a central role among primary schools in its respective area, satisfies the above 3 criteria and has excellent prospects of acting as a model school in the area to lead the educational activities of other schools.

**1) Rebuilding Urgency**

Apart from some extensions, the buildings of all 45 schools surveyed were constructed around 1975 and much deterioration is evident in regard to the main structural components, such as the floors, foundations, walls and pillars. Frequent typhoons have apparently inflicted additional damage to all parts of the buildings and the roof of most schools in particular simply hangs onto the lower structure through makeshift measures. Three schools (12 classrooms in total) were completely flattened by a typhoon in 1995, indicating that most of the school buildings in question are in too dangerous a state for continued use or are in danger of collapse when assaulted by another typhoon. Of the total of 456 classrooms, excluding those which are actually borrowed from or shared with secondary schools, only 80 are considered fit for continued use and the remainder should be rebuilt as soon as possible. The candidate recipient schools are classified into 3 ranks in terms of the rebuilding priority based on the degree of deterioration. The classification criterion for each rank is given below.

- State of makeshift building..... A
- Building constructed in around 1975..... A
- Building constructed since 1985..... B
- Number of classrooms to be rebuilt + number of existing classrooms  $\geq 0.5$  ..... A
- Number of classrooms to be rebuilt + number of existing classrooms  $\leq 0.5$  ..... B

Based on the above criteria, all 45 candidate recipient schools are classified as Rank A.

## 2) Necessity to Increase Number of Classrooms

The 45 candidate recipient schools have a total of 563 classrooms of which 107 are shared with secondary schools. The total number of classes at these schools is 987 which is 1.75 times higher than the number of classrooms (563). This class-classroom ratio increases to 2.3 when the shared classrooms are excluded. The real ratio is even higher as the 563 classrooms include semi-collapsed classrooms which can no longer be used. When classrooms are shared by both primary and secondary schools, the classrooms are used by the secondary schools in the morning and are used by the primary schools in the afternoon. In general, the buildings of the 45 schools in question are used for double or triple shifts. Thirty-four of the schools have a total of 90 branch schools to cope with the ever increasing number of pupils. Most of the branch schools use the facilities owned by People's Committees or cooperatives. In principle, a branch school is established for those pupils of lower grades whose walking distance to the main school exceeds 2.5 km. However, the reality is that 60 of the 90 branch schools are located near the respective main schools to compensate for the classroom shortage of the main schools. As described earlier, the conditions of these branch schools are even worse than those of the main schools. In the case of many schools, the dispersion of many functions among branch schools has resulted in inefficient management.

The classroom shortage is a bottleneck to improvement of the school enrolment rate and also poses a physical barrier for implementation of the official curriculum. Under these circumstances, an increase of the number of classrooms is an urgent necessity to eradicate triple shift teaching and to alleviate double shift teaching. The original request envisages the transfer and integration of classrooms currently belonging to branch schools as part of the arrangements to improve the facilities of main schools. As examination of the possibility of the rational integration of branch schools is deemed imperative to prepare a plan to increase the number of classrooms to an adequate level, a classroom increase is judged an appropriate measure to achieve efficient school education.

The degree of classroom shortage at each school is assessed based on the following criteria.

- Borrowed classrooms from or shared classrooms with a secondary school..... A
- Triple shift teaching is in operation ..... A
- Many branch schools due to a classroom shortage at the main school..... A
- Class-classroom ratio: between 1.5 and 2.0 ..... B
- Class-classroom ratio: 1.4 or less..... C

Based on the above criteria, all 45 candidate recipient schools are classified as Rank A.

### 3) Road Conditions Around Schools and Work Access

The road access conditions of the 45 schools surveyed significantly vary from one school to another. In terms of the distance to trunk state road A1, the nearest school is almost next to the road while the farthest school is located 65 km from the road. As far as bridges crossing rivers and/or ferry operation, etc. along the access road to each site are concerned, there is no foreseeable hindrance to the traffic of the construction machinery to be used for the Project and the transportation of construction equipment and materials to each site should be smoothly conducted. In general, the local economic situation worsens in accordance with the distance from the A1, resulting in slow progress of the improvement of school facilities and/or difficulty for local authorities to bear the cost of school repair. Some local roads are known to be submerged during a flood. As the longest closure is approximately one week, however, this does not constitute a prohibitive factor for Project-related construction work. Consequently, evaluation of the possible constraints vis-a-vis construction work is based on the site access and road conditions as these are factors to be noted in preparing the construction work plan.

- ① Site to which the vehicle travelling time is shorter than others has a higher rank
  - Site with a travelling time of upto one hour..... A
  - Site with a travelling time of between one hour and 2 hours ..... B
  - Site with a travelling time of more than 2 hours ..... C
- ② Road conditions at midway point
  - No submersion during a flood..... A
  - Submerged in part during a flood..... B

#### 4) Site Conditions

In regard to the site conditions, filling and/or banking will be required at 20 schools because of the presence of paddy fields or because of the low elevation of the site. Given the fact that these 20 schools are located in paddy field areas without suitable alternative sites, the work mentioned above is judged to be the best available option. At each of these sites, the Vietnamese side is required to conduct filling and banking. However, similar work was successfully completed in the Phase I and Phase II Projects with the cooperation of the respective People's Committees and local inhabitants prior to the commencement of the actual construction work at the sites. Accordingly, it appears safe to assume that the construction work under the Project will not encounter any constraints even if all 45 schools surveyed are declared to be the subject schools of the Project. Nevertheless, the site conditions are evaluated in terms of the following two ranks based on the amount of work to be conducted by the Vietnamese side for reference purposes.

- Site with no or little requirement for banking ..... A
- Site requiring banking for the entire land ..... B

#### 5) Diffusion Effects of Model Schools

The Project is designed to assist the Primary Education Facilities Improvement Programme promoted by the Ministry of Education and Training and is expected to act as a model project for similar attempts to improve primary school facilities in other parts of Viet Nam.

The 45 candidate recipient schools were originally selected by the Vietnamese side from among 72 schools at the initial stage. In the 3 provinces dealt with by the Project, there is an average of 18 - 24 primary schools in each district. Each district included in the Project has 1 - 4 candidate recipient schools. In deciding the likely degree of diffusion effect of a school acting as a model school, the diffusion effect is judged to be high if upto 2 schools are selected in a district and also if a school in question has already been selected as a designated model school by the provincial or district authority. In the case of those districts where more than one school is selected, the school size is used as the evaluation criterion for the importance of the school in question among schools in the same district. (The larger the size of a school, the more leading the function played by the school in question.) Three ranks are used to represent the likely diffusion effect of a selected school as a model school.



- Upto 2 schools in one district ..... A
- Designated model school by the provincial or district authority ..... A
- School size: 20 or more classes..... A
- School size: 10 - 19 classes..... B
- School size: less than 10 classes..... C

Having completed the initial evaluation of the 45 candidate recipient schools, all have been found to pose no constraints to the construction work and are classified A Rank in terms of both the rebuilding urgency and classroom shortage. However, in terms of the diffusion effect as a model school, 6 schools are classified as B Rank because of their medium size. However, all of these 6 primary schools play a central role among primary schools in their respective districts and still have high priority in terms of the urgency of rebuilding and extension. Consequently, the inclusion of all 45 candidate recipients schools in the scope of the Project is deemed appropriate. The 45 schools surveyed are listed in Table 2-1.

DISTRICT	NO. SCHOOL	REBUILDING URGENCY	DEGREE OF CLASSROOM SHORTAGE	DIFFUSION EFFECTS OF MODEL SCHOOLS	RESTRICTION ON CONSTRUCTION WORK			TOTAL EVALUATION
					DISTANCE TO SITE	ROAD CONDITIONS	SITE CONDITIONS	
<b>PROVINCE:QUANG BINH</b>								
Le Thuy	B3 Dinh Thuong	A+	A	A	A	A	A	A
	B1 My Thuy	A	A	A	B	B	A	A
Quang Ninh	B5 Tan Ninh	A	A	B	A	A	A	A
	B6 Gia Ninh	A	A	A	A	B	A	A
	B7 Ham Ninh	A	A	A	A	A	B	A
	B8 Hai Ninh	A	A	A	A	A	A	A
City Dong Hoi	B10 Loc Ninh No. 1	A	A	A	A	A	A	A
	B11 Dong Son No. 1	A	A	A	A	A	A	A
	B13 Nghia Ninh	A	A	A	A	A	A	A
Bo Trach	B14 Hoan Lao	A	A	A	A	A	A	A
	B15 Nhan Trach	A	A	B	A	A	A	A
	B16 Nam Trach	A	A	B	A	A	A	A
	B17 Thanh Trach	A	A	A	A	A	A	A
Quang Trach	B18 Canh Duong	A	A	A	B	A	A	A
	B19 Quang Tho	A	A	A	B	A	A	A
	B20 Quang Lien	A+	A	B	B	A	A	A
	B21 Quang Phuong B	A	A	B	B	A	A	A
Tuyen Hoa	B22 Tien Hoa	A	A	A	C	B	A	A
<b>PROVINCE:QUANG TRI</b>								
Vinh Linh	T1 Vinh Chap	A	A	A	B	A	A	A
	T3 Vinh Lam No. 2	A	A	A	A	A	A	A
Hai Lang	T8 Hai Chanh	A	A	A	A	A	B	A
Huong Hoa	T12 Tan Long	A	A	A	C	A	A	A
Cam Lo	T13 Cam Thanh	A	A	A	A	A	A	A
	T15 Cam Tuyen	A	A	A	A	B	A	A
Trieu Phong	T17 Trieu Phuoc	A	A	A	C	A	B	A
Dong Ha	T19 Dong Thanh	A-	A	A	A	A	A	A
Gio Linh	T22 Gio Phong	A	A	A	A	A	A	A
	T24 Gio Quang	A	A	A	A	B	A	A
City Quang Tri	T26 P2 TX Quang Tri	A	A	A	A	A	A	A
<b>PROVINCE:THUA THIEN HUE</b>								
Phu Loc	H2 Vinh Mi 5	A	A	A	C	B	A	A
	H3 An Nong	A	A	A	A	A	A	A
	H6 Nuoc Ngot	A-	A	A	B	A	A	A
	H9 Loc Tri	A	A	A	B	A	B	A
Huong Thuy	H8 Thuy Phu 2	A	A	A	A	A	A	A
	H29 Thuy Van	A	A	B	A	A	A	A
Phu Vang	H11 Vinh Thai	A	A	A	A	B	A	A
	H12 Phu My 1	A-	A	B	A	A	A	A
	H13 Phu An 2	A	A	A	A	A	A	A
Huong Tra	H16 Binh Dien	A	A	A	A	A	A	A
	H19 Huong Van 1	A	A	A	A	A	A	A
Quang Dien	H21 Quang Loi	A	A	A	B	B	B	A
Quang Dien	H22 Quang Thanh	A	A	A	A	A	A	A
Phong Dien	H24 Lu Dien	A	A	A	B	A	B	A
	H25 Dien An	A	A	A	A	A	A	A
	H27 Tay Dien	A	A	B	A	A	A	A

### (3) Examination of Requested Facilities and Equipment

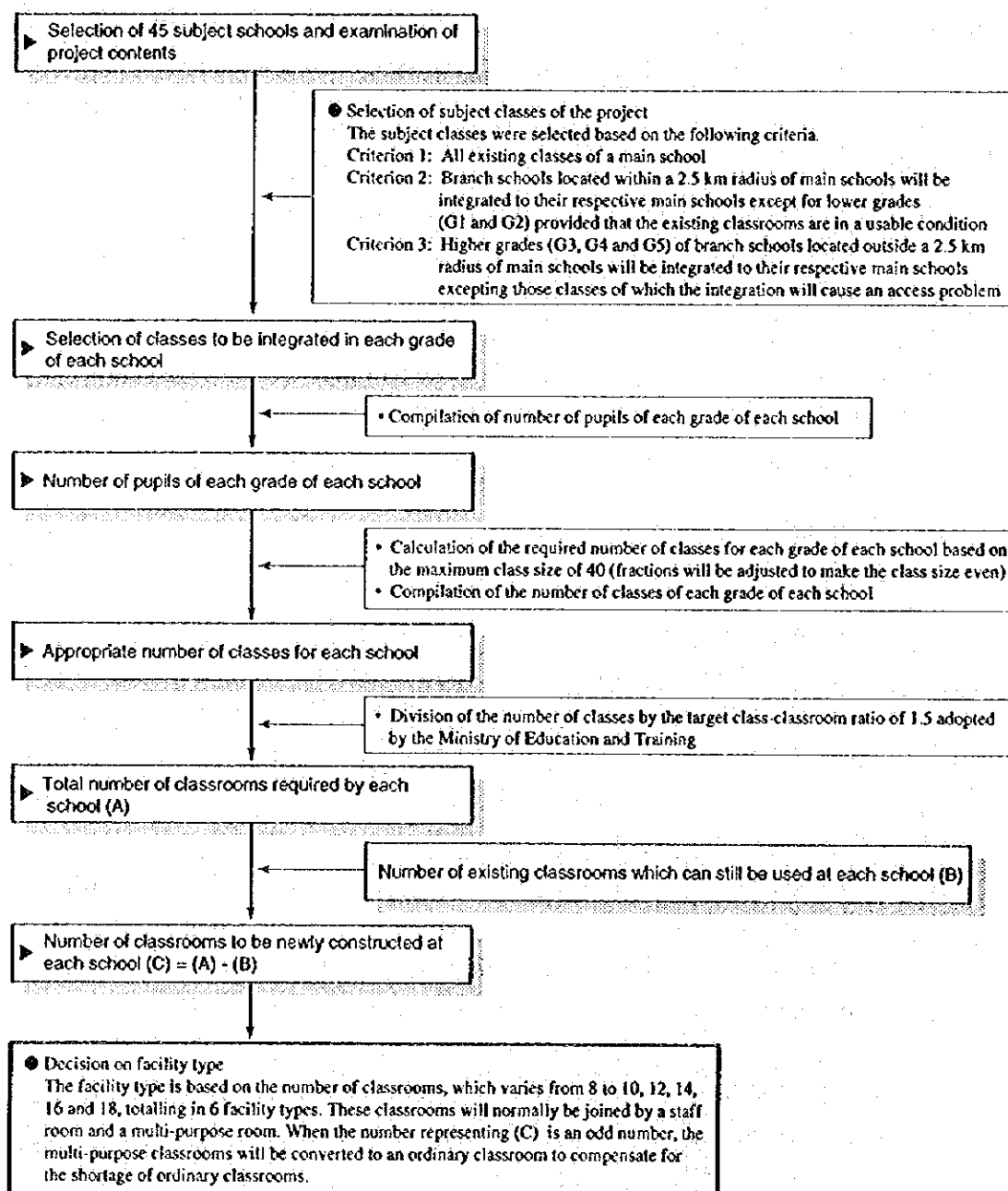
As the number of pupils of the primary schools selected for the Project greatly varies from 306 to 1,658 (inclusive of those of branch schools), the appropriate size of each school must be determined, taking the conditions of the integration of branch schools, site conditions and layout of existing buildings, etc. into consideration. The Viet Nam side has requested a minimum of 10 classrooms/school. However, given the larger number of schools to be rebuilt among the 3 phases so far, emphasis is placed on appropriate improvement of the facilities of as many schools as possible through calculation of the minimum number of classrooms for each school based on the operational requirements. The main items to be examined in determining the school size, etc. are described below.

#### 1) General Classrooms

- ① The appropriate number of classrooms for each school is calculated by dividing the number of pupils (including the pupils of branch schools, if any) of each grade by the standard class size of 40 pupils.
- ② In principle, a branch school to be integrated must be located within a 2.5 km radius of the main school and must require urgent rebuilding. If the existing facilities are still usable, the classes of lower grades (G1 and G2) will not be integrated.
- ③ In the case of branch schools which are located outside a 2.5 km radius of the respective main schools, only the classes of higher grades (G3, G4 and G5) will be integrated. However, those of which the existing facilities are still usable or which are located farther than 4 km from the main school and of which the integration will result in access difficulties for the pupils to the new school, i.e. main school, will not be integrated.
- ④ The planned number of classrooms for each school should be sufficient to eradicate triple shift teaching and should be as close as possible to a class-classroom ratio of 1.5 which is the target ratio adopted by the Ministry of Education and Training for the improvement of school facilities.
- ⑤ The existing facilities should be preserved as much as possible in order to add new classrooms to alleviate the classroom shortage.

- ⑥ One key planning principle for the number of classrooms is that no triple shift teaching should be required vis-a-vis the estimated increase of the number of pupils in the year 2000. The number of pupils per school in question in the year 2000 is estimated based on the number of pre-school children (0 - 5 years old in fiscal 1995/96) in each school catchment area.

Following flow chart shows the computation for required number of classrooms.



## 2) Multi-Purpose Classrooms

In the Phase I and Phase II Projects, multi-purpose classrooms were separately constructed from general classrooms for science and music education subjects, etc. in response to a request made by the Government of Viet Nam. Taking into consideration the increasing trend of the number of pupils, absolute shortage of classrooms, mode of education and availability of educational equipment, etc., it is apparent that there is no room for multi-purpose (special purpose) classrooms to be set aside from general classrooms. Even if multi-purpose classrooms are introduced, they will end up as general classrooms to alleviate the room shortage. The target class-classroom ratio of 1.5, the facility improvement target ratio adopted by the Ministry of Education and Training, suggests that the future pupil increase can be dealt with by a double shift and that, if the number of pupils decreases in the more distant future, full-time, single shift schooling may become a reality. The priority of the Project is given to the construction of as many classrooms as possible so that the resulting class-classroom ratio, including multi-purpose classrooms, is as near the target ratio of 1.5 as possible.

## 3) Staff Room, etc.

While 39 of the 45 schools have a headmaster's office, few schools have a staff room or only have a staff room which is too small to accommodate all the teachers. All the rooms are badly deteriorated and require rebuilding along with the classrooms. The teachers generally conduct their work outside teaching hours at their classroom desks but the double or triple shift schooling means that the availability of desks for such purposes is limited. It is, therefore, essential that all 45 schools have an independent staff room which is capable of accommodating all teachers in order to ensure appropriate school management and to improve the quality of education. Under the Project, a large common staff room is planned to provide desk space for not only ordinary teachers but also for the headmaster and deputy headmaster.

## 4) Toilets

The provision of an appropriate number of toilets is essential from the viewpoint of an acceptable educational environment and the standard of sanitation. Due to the lack of public water supply and sewerage services, the use of groundwater and a simplified septic tank for ground infiltration is planned as in the case of the previous Phases. The toilet building must be at an appropriate distance from both the classroom building and the well and a pleasant environment must be maintained by means of natural ventilation.

## 5) Equipment

The equipment requested consists of very basic school fixtures and teaching materials. The school fixtures include desks and chairs for teachers in the staff room and desks and chairs for both teachers and pupils, blackboards and cabinets, etc. in the classrooms and should be regarded as the minimum requirement. The teaching materials also comprise basic, essential materials on such subjects as the Vietnamese language, arithmetic, general science, social studies and music and should be compatible with those provided under the primary education project of the World Bank. The continuous provision of these teaching materials, following the similar provision in the previous Phases, should prove very effective in improving the quality of primary education in Viet Nam and is, therefore, judged to be an appropriate part of the Project.

## (4) Examination Results

Having fully examined the requested facilities and equipment for the candidate recipient schools, the Project is judged to be highly feasible with a high level of positive effects and is deemed both highly necessary and urgent, worthy of implementation as a grant aid project of the Government of Japan to follow the Phase I and Phase II Projects. Based on the examination results described above, the appropriate contents of the Project are outlined below.

### 1) Recipient Schools and Number of Classrooms

Quang Binh Province.....	18 schools with 216 classrooms
Quang Tri Province.....	11 schools with 114 classrooms
Thua Thien-Hue Province .....	16 schools with 184 classrooms
<b>Total</b>	<b>45 schools with 514 classrooms</b>

### 2) Facilities Subject to the Project

- Rebuilding and extension of classrooms and staff room
- Rebuilding and new construction of toilets and water supply facilities

Table 2-2 gives the examination results and planned work for each school.

PROVINCE: QUANG BINH-1		proposed facilities										estimate/AD. 200X									
NO.	district	school name	existing nos. of pupils	site conditions	existing state of schools		proposed state of schools	proposed nos. of pupils	proposed nos. of classes	nos. of classroom in MOET standard	type of facilities	[A] class room	[B] multipurpose room	administration room	sanitary block	[C] usable rooms	[A]+[B]+[C]	classes/rooms	average	rate of increase of pupils	classes/rooms
					main	sub															
	Le Thuy	B3 Dinh Thuong	670	ex.	main sub	(X2)	main	670	18	12	12 A2	12	1	L	W1	0	13	1.38	1.38	1.32	1.83
		B4 My Thuy	840	new	main sub	(X2)	main sub	772	21	14	14 A2	14	1	L	W2	0	15	1.40	1.35	1.03	1.39
	Quang Ninh	B5 Tan Ninh	306	ex.	main sub	(X2)	main sub	272	10	7	8 A1	8	1	S	W1	0	9	1.11	1.20	1.21	1.45
		B6 Gia Ninh	1024	ex.	main sub	(X2)	main sub	827	22	15	14 A2	15	0	L	W2	0	15	1.47	1.50	1.35	2.03
		B7 Ham Ninh	871	ex.	main sub	(X4)	main sub	871	23	15	14 A2	15	0	L	W2	0	15	1.53	1.53	1.24	1.90
		B8 Hai Ninh	681	new	main sub	(X4)	main sub	488	14	9	10 A1	10	1	S	W1	0	11	1.27	1.47	1.24	1.82
	City Dong Ho	B10 Loc Ninh No.1	778	ex.	main sub	(X1)	main sub	590	17	11	10 A1	11	0	S	W1	0	11	1.55	1.53	1.14	1.75
		B11 Dong Son No.1	708	ex.	main sub	(X1)	main sub	708	20	13	10 A2	11	0	L	W1	2	13	1.54	1.54	1.03	1.58
		B13 Nghia Ninh	793	ex.	main sub	(X2)	main sub	674	18	12	10 A2	10	1	L	W1	2	13	1.38	1.38	1.23	1.69
	Bo Trach	B14 Hoan Lao	850	new	main		main	850	22	15	14 A2	15	0	L	W2	0	15	1.47	1.47	1.04	1.53
		B15 Nhan Trach	433	new	main		main	433	12	8	8 A1	8	1	S	W1	0	9	1.33	1.33	1.14	1.52
		B16 Nam Trach	498	ex.	main sub	(X1)	main sub	498	15	10	8 A1	8	1	S	W1	2	11	1.36	1.36	0.92	1.25
		B17 Thanh Trach	886	ex.	main		main	886	24	16	16 A2	16	1	L	W2	0	17	1.41	1.41	1.00	1.41
	Quang Trach	B18 Canh Duong	1018	ex.	main		main	1018	27	18	18 A2	18	1	L	W3	0	19	1.42	1.42	0.81	1.19
		B19 Quang Tho	1259	ex.	main sub	(X2)	main sub	1259	33	22	14 A2	14	1	L	W3	8	23	1.43	1.43	1.34	1.92

PROVINCE: QUANG BINH-2		proposed facilities										estimate/AD. 2000									
		type of facilities	[A] class room	(B) multipurpose room	administration room	sanitary block	[C] usable rooms	[A]+[B]+[C]	classes/rooms	average	rate of increase of pupils	classes/rooms									
	school name	existing nos. of pupils	site conditions	existing state of schools	proposed state of schools	proposed nos. of pupils	proposed nos. of classes	nos. of classroom in MOET standard													
	district	761	ex.	main	main	761	21	14	14 A2	14	1	L	W2	0	15	1.40	1.40	1.15	1.61		
	NO.	599	ex.	main	main	599	17	11	10 A1	10	1	S	W1	0	11	1.55	1.55	1.27	1.96		
		626	ex.	main	main	626	18	12	12 A2	12	1	L	W1	0	13	1.38	1.38	1.16	1.61		
		13601		main (X18) sub (X23)	main (X18) sub (X19)	12802	352	235	216	221	13	18	18	14	248	1.42	1.43	1.15	1.64		
	TOTAL					799	27							17	17	1.59					



PROVINCE:QUANG TRI

district	NO.	school name	existing nos. of pupils	site conditions	existing state of schools		proposed state of schools	proposed nos. of pupils	proposed nos. of classes	nos. of classroom in MOET standard	proposed facilities							estimate/AD:2000					
					main sub (X3)	sub (X1)					(A) class room	(B) multipurpose room	administration room	sanitary block	(C) usable rooms	[A]+[B]+[C]	classes/rooms	average	rate of increase of pupils	classes/rooms			
Vinh Linh	T1	Vinh Chap	635	ex.	main sub (X3)	main sub (X2)	500	15	10	10	10	A1	10	1	S	W1	0	11	1.36	1.33	1.13	1.51	
			346	new	main sub (X1)		346	10	7	8	A1	8	1	S	W1	0	9	1.11	1.11	1.28	1.42		
Hai Lang	T8	Hai Chanh	951	new	main sub (X3)	main sub (X2)	656	18	12	12	A2	12	1	L	W1	0	13	1.38	1.42	1.01	1.44		
			392	ex.	main sub (X1)		379	12	8	8	A1	8	1	S	W1	0	9	1.33	1.40	1.17	1.64		
Cam Lo	T13	Cam Thanh	955	ex.	main sub (X1)	main sub (X1)	935	25	17	17	A2	17	0	L	W2	0	17	1.47	1.47	1.08	1.59		
			605	new	main sub (X3)	main sub (X1)	425	11	7	8	A1	8	1	S	W1	0	9	1.22	1.46	1.09	1.59		
Trieu Phong	T17	Trieu Phuoc	915	ex.	main sub (X3)	main sub (X1)	787	22	15	14	A2	14	1	L	W2	0	15	1.47	1.47	1.17	1.72		
			377	new	main sub (X1)	main sub (X1)	377	10	7	8	A1	8	1	S	W1	0	9	1.11	1.11	1.28	1.42		
Gio Linh	T22	Gio Phong	627	new	main sub (X2)	main sub (X1)	517	15	10	10	A1	10	1	S	W1	0	11	1.36	1.40	1.45	2.03		
			325	new	main sub (X1)	main sub (X1)	325	10	7	8	A1	8	1	S	W1	0	9	1.11	1.11	1.40	1.56		
City/Quang Tri	T26	P2 TX Quang T	1356	ex.	main sub (X3)	main sub (X1)	658	18	12	12	A2	12	1	L	W1	0	13	1.38	1.55	0.96	1.48		
			7484		main sub (X1)	main sub (X2)	5925	166	112	114		115	10	11	11	0	125	1.33	1.39	1.18	1.58		
TOTAL							1559	52	0				32	32	1.63								

PROVINCE: HUA THIEN HUE-1

district	NO.	school name	existing nos. of pupils	site conditions	existing state of schools	proposed state of schools	proposed nos. of pupils	proposed nos. of classes	nos. of classroom in MOET standard	proposed facilities							estimate/AO.2000		
										[A] class room	[B] multipurpose room	administration room	sanitary block	[C] usable rooms	[A]+[B]+[C]	classes/rooms	average	rate of increase of pupils	classes/rooms
Phu Loc	H2 Vinh Mi 5		970	new	main sub (X4)	main sub (X2)	822	22	15	14 A2	15	0	L W2	0	15	1.47	1.37	0.79	1.08
			1658	new	main sub (X4)	main sub (X3)	1402	36	24	18 A2	18	1	L W3	6	25	1.44	1.45	0.89	1.29
	H6 Nuoc Ngot		1643	new	main sub (X7)	main sub (X2)	1298	34	23	18 A2	19	0	L W3	4	23	1.48	1.57	1.13	1.78
			1045	new	main sub (X5)	main sub (X1)	991	26	17	16 A2	17	0	L W2	0	17	1.53	1.56	0.88	1.37
Huong Thuy	H8 Thuy Phu 2		766	new	main sub (X3)	main sub (X1)	670	18	12	8 A2	9	0	L W1	3	12	1.50	1.43	0.99	1.41
			587	ex.	main sub (X2)	main sub (X1)	528	15	10	10 A1	10	1	S W1	0	11	1.36	1.31	1.10	1.44
Phu Vang	H11 Vinh Thai		713	new	main sub (X5)	main sub (X2)	528	16	11	10 A1	11	0	S W1	0	11	1.45	1.43	1.04	1.49
			524	ex.	main sub (X2)	main sub (X2)	131	4	10	8 A1	8	1	S W1	3	12	1.25	1.25	1.35	1.69
Huong Tra	H13 Phu An 2		960	new	main sub (X1)	main sub (X1)	686	19	13	10 A2	10	1	L W2	3	14	1.36	1.44	0.98	1.42
			535	ex.	main sub (X1)	main sub (X1)	274	7	10	10 A1	10	1	S W1	0	11	1.36	1.36	1.45	1.98
Quang Dien	H21 Quang Loi		540	new	main sub (X1)	main sub (X1)	540	16	11	10 A1	11	0	S W1	0	11	1.45	1.45	1.00	1.45
			716	new	main sub (X1)	main sub (X1)	716	20	13	12 A2	13	0	L W1	0	13	1.54	1.54	1.27	1.95
Phong Dien	H24 Uu Dien		641	ex.	main sub (X4)	main sub (X4)	641	17	11	8 A1	8	1	S W1	4	13	1.31	1.31	1.17	1.53
			1208	ex.	main sub (X6)	main sub (X6)	733	20	13	10 A2	11	0	L W1	2	13	1.54	1.41	1.17	1.65
			733	new	main sub (X2)	main sub (X2)	733	20	13	12 A2	13	0	L W1	0	13	1.54	1.54	0.78	1.20

PROVINCE: THUA THIEN HUE-2		proposed facilities										estimate/AD.2000								
NO.	district	school name	existing nos. of pupils	site conditions	existing state of schools	proposed state of schools	proposed nos. of pupils	proposed nos. of classes	nos. of classroom in MOET standard	type of facilities	[A] class room	[B] multipurpose room	administration room	sanitary block	[C] usable rooms	[A]+[B]+[C]	classes/rooms	average	rate of increase of pupils	classes/rooms
	H27 Tay Hien		478	now	main sub (X2)	main	478	14	9	10 A1	10	1	S	W1	0	11	1.27	1.27	1.12	1.43
			13717		main sub (X16) (X46)	main sub (X16) (X19)	11825	323	215	184	193	7	16	16	25	225	1.44	1.43	1.07	1.51
	TOTAL						1838	58							41	41				

SUMMARY		計画施設 2000年予算値										2000年予算値								
NO.	district	school name	existing nos. of pupils	site conditions	existing state of schools	proposed state of schools	proposed nos. of pupils	proposed nos. of classes	nos. of classroom in MOET standard	type of facilities	[A] class room	[B] multipurpose room	administration room	sanitary block	[C] usable rooms	[A]+[B]+[C]	classes/rooms	average	rate of increase of pupils	classes/rooms
	QUANG BINH		13601	-	main sub (X18) (X23)	main sub (X18) (X19)	12802	352	235	216	221	13	18	18	14	248	1.42	1.43	1.15	1.61
	QUANG TRI		7484	-	main sub (X11) (X22)	main sub (X11) (X11)	5925	166	112	114	115	10	11	11	0	125	1.33	1.39	1.18	1.58
	THUA THIEN HUE		13717	-	main sub (X16) (X46)	main sub (X16) (X19)	11825	323	215	184	193	7	16	16	25	225	1.44	1.43	1.07	1.51
	TOTAL		34802	-	main sub (X45) (X91)	main sub (X45) (X39)	30552	841	562	514	529	30	45	45	39	598				

## **2.3 Basic Design**

### **2.3.1 Design Principles**

The Project aims at improving existing primary schools in 3 coastal provinces in central Viet Nam, namely Quang Binh, Quang Tri and Thua Thien-Hue, by means of rebuilding the existing facilities and also providing new facilities as well as basic school fixtures and teaching materials. The basic design for the Project is conducted in accordance with the following principles, taking the contents of the original request of the Government of Viet Nam and the results of consultations which took place during the field survey into consideration.

#### **(1) Design Principles Regarding Natural Conditions**

One prominent characteristic of the natural conditions of the Project Area is constantly high temperatures throughout the year in the northern part of the country where the Phase I Project was implemented. In addition, the school buildings in the Project Area are subject to severe damage by typhoons and flooding every year. Careful consideration will, therefore, be required in the implementation of appropriate measures to prevent strong solar radiation on the roof from causing an excessive rise of the room temperature. In addition, the building design should allow good natural ventilation in order to ensure a pleasant indoor environment. A trussed roof on concrete slabs will be used as the most effective and popular heat insulation method and additional care will be taken to preventing the collapse of the buildings due to strong force of typhoons. The height of the ground floor should be set higher than the highest flood water level recorded in the past at each site to prevent the new buildings from being submerged due to future floods. In principle, banking will be conducted at all the new sites to raise the site elevation. In the case of the new buildings being constructed on existing premises, the planned new building site will be raised by banking.

Mechanical building services will be kept to a minimum and natural ventilation and natural lighting will be utilised as much as possible. The building axis should run from east to west to avoid the penetration of morning and evening sun into the classrooms. Eaves will be introduced above the windows and openings to efficiently shut out rain. Local aseismatic standards will be employed as weak earthquakes occasionally occur.

#### **(2) Design Principles Regarding Social Conditions**

The standard design specifications for school facilities set by the Ministry of Education and Training, taking the lifestyle and various conditions in Viet Nam into consideration,

should be respected so that the design of the new school facilities will ensure that they are regarded as model facilities for similar projects in other areas. Another consideration is that the school facilities to be constructed under the Project should be capable of acting as evacuation shelters at the time of a typhoon or flood and also as centres for communal social and educational activities (such as extramural education, literacy education, mother and child health care activities and environmental hygiene education, etc.) A lighting system should be provided to allow these activities to be conducted at the subject schools at night.

**(3) Design Principles Regarding Local Construction Industry**

The basic wage for each type of job in Viet Nam is calculated by multiplying the minimum wage by the job index. There are, in fact, 2 types of minimum wage, i.e. that for domestic enterprises and that for foreign subsidiaries (Decree No. 26/CP, March, 1993). In addition to the basic wage, workers are paid various allowances pursuant to the Labour Law and Notification of the Ministry of Construction (Circular Letter No. 03/VKT-BXD, March, 1994). Careful attention must be paid in calculating the accurate construction cost to the types of jobs involved and local method of employment. Any construction project in Viet Nam requires the advance permission of the Design Inspection Bureau of the Ministry of Construction. Application for this permission should be made by the Ministry of Education and Training which is the project implementation agency. As one month is usually required for permission to be granted, this period should be taken into consideration in the planning of the project implementation schedule.

**(4) Design Principles Regarding Local Construction Companies and Local Construction Equipment and Materials**

In the 3 provinces in question, there are public construction companies controlled by the Ministry of Construction as well as private construction companies and these will be used as sub-contractors for the Japanese Contractor for the Project. Although the construction sites under the Project are widespread, it is essential to ensure uniform technologies and work quality at all sites in accordance with integrated schedule control in view of the smooth progress of the entire work. It is necessary to examine a number of sites in each province and the capability of local construction companies to establish a construction work implementation system whereby the construction work at all sites is conducted by teams of a uniform technical standard.

In principle, all construction equipment and materials will be locally procured to facilitate the maintenance of the facilities after their handing over to the Viet Nam side. In view of the timely and proper procurement of the construction equipment and materials in

accordance with the progress of the construction work as a whole, it will be necessary to establish a system for the central procurement and control of such equipment and materials. The experience gained with the previous Phases indicates the importance of particularly careful arrangements for the procurement of timber and the manufacture of wooden fixtures at the initial stage of the construction work. Procurement in Hanoi, Ho Chi Minh and/or Da Nang will be planned for finishing materials and electrical equipment and materials as it is difficult to obtain the necessary quantities in the 3 provinces.

(5) Design Principles Regarding Management and Maintenance Capabilities of Project Implementation Agency

The school management and maintenance responsibilities fall on the school governing committee which is comprised of the headmaster, deputy headmaster and representatives of parents under the supervision of the local People's Committee. The design of the new facilities should ensure that no special maintenance skills are required. The use of local construction equipment and materials for the building structure, as well as building services, together with a strong and simple structure will facilitate easy and low cost maintenance following handing over of the new facilities to the Viet Nam side. In the previous Phases, site preparation, erection of fences, playground preparation and landscaping, etc. were conducted with the assistance of local inhabitants. Similar assistance is hoped for the Phase III Project.

(6) Design Principles Regarding Facility and Equipment Grades

As mentioned previously, the Project intends the construction of primary school facilities, i.e. classroom building and toilet building, and the provision of basic educational equipment, etc. The Project is expected to act as a model for Vietnam's future self-reliant efforts to improve primary school facilities in other parts of the country. The design of the educational facilities and equipment for the Project should, therefore, follow the standard specifications set by the Facility Design Research Institute of the Ministry of Education and Training in order to provide primary educational facilities of suitable grades. Similarly, the specifications of the school fixtures should be based on the relevant standards set by the Ministry of Education and Training. The educational equipment to be procured should also be compatible with that of the ongoing primary school project of the World Bank and should, in principle, be procured locally.

## **(7) Design Principles Regarding Construction Schedule**

The 45 schools in question are basically distributed in a some 280 km long north-south stretch of land along trunk national route A1. Given the capability of local construction companies, it is possible to complete the construction of the 45 schools in a relatively short period of time provided that an appropriate number of construction teams is formed in each province with a view to efficiently conducting the work by combining several sites into a single area to be dealt with by one team. Careful preparation of the construction schedule is also necessary in view of completing the entire construction work in a single fiscal year as required by the grant aid scheme of the Government of Japan. The construction schedule planning should pay particular attention to the presence of the rainy season as well as the typhoon/flooding season from September to October in central Viet Nam.

### **2.3.2 Basic Design Components**

#### **(1) Layout/Building Distribution Plan**

The site conditions naturally vary from one site to another. The best layout plan will be prepared for each school, taking the site shape, surrounding environment, existing facility layout and efficient use of the available land, etc. into consideration. The design principles for site use and facility layout are described below.

- 1) The layout plan should ensure the harmonious integration of the new facilities in the overall school layout plan, taking the distribution of the existing facilities into consideration.
- 2) The layout plan should ensure a maximum playground size as part of the overall school layout plan.
- 3) The layout plan should ensure the continuous use of the existing facilities without disturbance during the construction period even if such facilities are destined for future demolition.
- 4) The distance between neighbouring buildings should be sufficiently wide to allow effective natural ventilation. The position of the toilet building should be carefully determined in view of possible odour problems vis-a-vis the classrooms and groundwater contamination vis-a-vis the nearby well.

- 5) The building axis should run in the east-west direction to prevent the penetration of morning and evening sunlight into the building.
- 6) As many existing trees as possible should be preserved.
- 7) The new buildings should preferably be constructed on flat ground in view of ensuring the structural safety of the foundations.
- 8) The new buildings should avoid those areas where they may be liable to damage due to typhoons or flooding. If they are constructed on banked ground, their position should be sufficiently distant from the edge of the banked area.

The layout plan for each school is attached at the end of this report.

## (2) Building Plan

### 1) Basic Principles for Building Plan

The details of the building plan for the Project are basically in line with those of the Phase I and Phase II Projects but also include the following principles agreed upon through consultations with the Vietnamese side.

- The configuration of the new facilities will be as compact as possible to achieve the lowest construction cost. For this purpose, the combination of a 2-storey classroom building and single-storey administration building employed in the previous two Phase will be replaced by one 2-storey building. In this way, the roof area and foundation area can be reduced while providing the necessary floor area.
- The side corridors, which also act as eaves, will be replaced by a single side corridor to reduce the overall floor area. Horizontal louvres will be introduced above the windows to act as eaves.
- A dual roof structure will be employed to achieve the necessary heat insulation indoors.

### 2) Floor Plan

#### ① Classroom Size

The classroom size will be 43.32 m<sup>2</sup> (5.7 m × 7.6 m) as in the case of the Phase I and Phase II Projects and will be capable of seating 36 - 40 pupils in accordance



with the standard design (set by the Workshop on Design Samples for Primary Schools) of the Ministry of Education and Training.

② Staff Room

Two types of staff rooms are planned to meet different size requirements based on the number of teachers. Both types will be based on the Workshop Design Samples for Primary Schools of the Ministry of Education and Training. For upto 17 teachers, the staff room size will be 43.32 m<sup>2</sup> (A1 type), the same size as the classrooms. If the number of teachers exceeds 17, the staff room size will be 64.98 m<sup>2</sup> (A2 type) and will be provided with a separate meeting room. In principle, the headmaster will share the staff room with the teachers although the headmaster's office area will be separated from the rest of the room through the appropriate distribution of furniture.

Because of the different number of classrooms and facility composition depending on the school, several standard types of facility compositions will be established to facilitate selection of the most appropriate type which suits the specific conditions of each school. All of the standard types involve a 2-storey building with a differing number of classrooms, i.e. 4, 6, 8, 10 or 12, in addition to either an A1 type or A2 type staff room and multi-purpose classroom. The required facility size of each school will be met by a combination of the above factors (classrooms, staff room and multi-purpose classroom).

Table 2-3 Combination of Facility Unit Types Vis-a-Vis School Size

Number of Classrooms	Number of Teachers	Combination of Unit Types	Total Floor Area (m <sup>2</sup> )	Remarks
8	upto 17	④	658.92	8A1
8	18 or more	⑤	732.64	8A2
10	upto 17	⑦	791.56	10A1
10	18 or more	⑧	849.68	10A2
12	upto 17	① + ③	908.20	4A1 + 8
12	18 or more	② + ③	966.72	4A2 + 8
14	18 or more	② + ⑥	1,083.76	4A2 + 10
16	18 or more	③ + ⑤	1,200.80	8A2 + 8
18	18 or more	⑤ + ⑥	1,317.84	8A2 + 10

Table 2-4 Composition of Standard Facility Units

Unit Type	Number of Classrooms	Multi-Purpose Classroom	Staff Room	Meeting Room	Total Floor Area (m <sup>2</sup> )
① A1 type	4	1	1 (A1)	0	440.04
② A2 type	4	1	1 (A2)	1	498.56
③ 8 type	8	0	0	0	468.16
④ 8A1 type	8	1	1 (A1)	0	658.92
⑤ 8A2 type	8	1	1 (A2)	1	732.64
⑥ 10 type	10	0	0	0	585.20
⑦ 10A1 type	10	1	1 (A1)	0	791.56
⑧ 10A2 type	10	1	1 (A2)	1	849.68
⑨ 12 type	12	0	0	0	702.24

③ Toilet Building

There will be 3 different types, i.e. sizes, of toilet building to reflect the overall school size as in the case of the previous two Phases. The building specifications will follow the standard specifications set by the Ministry of Education and Training in respect of the local lifestyle and customs. The water to be supplied will be mainly groundwater and rainwater will also be used to supplement the groundwater. The sewage treatment system will use a simplified septic tank for ground infiltration. Table 2-5 gives the details of the different types of toilet building.

Table 2-5 Toilet Building Size by Type

Type	Number of Classrooms	Toilet Facilities				Floor Area (m <sup>2</sup> )
		Boys		Girls		
		Closet	Urinal	Closet	Urinal	
W-1	8 - 12	3	10	3	10	40.00
W-2	13 - 16	4	14	4	14	57.75
W-3	17 - 20	5	18	5	18	60.25

The combination of the different facilities and their total floor area for each school are shown in Table 2-6.

## COMBINATION OF FACILITIES FOR PROPOSED SCHOOLS

DISTRICT	NO.	SCHOOL	SCHOOL TYPE	FOUNDATION TYPE	FLOOR AREA (m. sq.)	UNIT TYPE									
						MAIN BUILDING BLOCK					SANITARY				
						4A2 type	8A1 type	8A2 type	10A1 type	10A2 type	8 type	10 type	W1 type	W2 type	W3 type
<b>QUANG BINH PROVINCE</b>															
Le Thuy	B3	Dinh Thuong	12 A2	A	1,025.72	○					○		○		
	B4	My Thuy	14 A2	C	1,156.51	○						○		○	
Quang Ninh	B5	Tan Ninh	8 A1	C	733.12		○						○		○
	B6	Gia Ninh	14 A2	A	1,156.51	○						○		○	
	B7	Ham Ninh	14 A2	C	1,190.71	○						○		○	
	B8	Hai Ninh	10 A1	A	850.16				○				○	○	
Dong Hoi	B10	Loc Ninh No. 1	10 A1	A	850.16				○				○	○	
	B11	Dong Son No. 1	10 A2	A	908.68					○			○	○	
	B13	Nghia Ninh	10 A2	A	908.68					○			○	○	
Bo Trach	B14	Hoan Lao	14 A2	A	1,156.51	○						○		○	
	B15	Nhan Trach	8 A1	A	733.12		○						○		○
	B16	Nam Trach	8 A1	A	733.12		○						○		○
	B17	Thanh Trach	16 A2	A	1,307.75			○			○			○	
Quang Trach	B18	Canh Duong	18 A2	A	1,471.49			○				○		○	
	B19	Quang Tho	14 A2	A	1,224.91	○		○				○		○	○
	B20	Quang Lien	14 A2	A	1,156.51	○						○		○	
	B21	Quang Phuong B	10 A1	A	850.16				○				○	○	
Tuyen Hoa	B22	Tien Hoa	12 A2	A	1,025.72	○					○		○		
<b>SUB TOTAL</b>			<b>216</b>		<b>18,439.51</b>	<b>8</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>7</b>	<b>10</b>	<b>7</b>	<b>1</b>
<b>QUANG TRI PROVINCE</b>															
Vinh Linh	T1	Vinh Chap	10 A1	A	850.16				○				○		
	T3	Vinh Lam No. 2	8 A1	A	733.12		○						○		○
Hai Lang	T8	Hai Chanh	12 A2	C	1,025.72	○					○		○		
Huong Hoa	T12	Tan Long	8 A1	A	733.12		○						○		○
Cam Lo	T13	Cam Thanh	16 A2	A	1,341.95			○			○			○	
	T15	Cam Tuyen	8 A1	A	733.12		○						○		○
Trieu Phong	T17	Trieu Phuoc	14 A2	C	1,156.51	○						○		○	
Dong Ha	T19	Dong Thanh	8 A1	C	733.12		○						○		○
Gio Linh	T22	Gio Phong	10 A1	A	850.16				○				○	○	
	T24	Gio Quang	8 A1	A	733.12		○						○		○
Quang Tri	T26	P2 TX Quang Tri	12 A2	C	1,039.47	○					○			○	
<b>SUB TOTAL</b>			<b>114</b>		<b>9,929.57</b>	<b>3</b>	<b>5</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>8</b>	<b>3</b>	<b>0</b>
<b>THUA THIEN HUE PROVINCE</b>															
Phu Loc	H2	Vinh My 5	14 A2	A	1,156.51	○						○		○	
	H3	An Nong	18 A2	C	1,471.49			○				○			○
	H6	Nuoc Ngot	18 A2	C	1,471.49					○	○				○
	H9	Loc Tri	16 A2	C	1,341.95						○			○	
Huong Thuy	H8	Thuy Phu 2	8 A2	C	791.64			○					○		○
	H29	Thuy Van 1	10 A1	A	850.16				○				○	○	
Phu Vang	H11	Vinh Thai	10 A1	A	850.16				○				○	○	
	H12	Phu My 1	8 A2	C	791.64		○						○	○	
	H13	Phu An 2	10 A2	C	908.68					○			○	○	
Huong Tra	H16	Binh Dien	10 A1	A	850.16				○				○	○	
	H19	Huong Van 1	10 A1	C	850.16				○				○	○	
Quang Dien	H21	Quang Loi	12 A2	C	1,025.72	○					○		○	○	
	H22	Quang Thanh	8 A1	C	733.12		○						○	○	
Phong Dien	H24	Uu Dien	10 A2	C	908.68					○			○	○	
	H25	Dien An	12 A2	C	1,025.72	○					○		○	○	
	H27	Tay Hien	10 A1	C	850.16				○				○	○	
<b>SUB TOTAL</b>			<b>184</b>		<b>15,877.44</b>	<b>3</b>	<b>1</b>	<b>4</b>	<b>5</b>	<b>3</b>	<b>4</b>	<b>2</b>	<b>12</b>	<b>2</b>	<b>2</b>
<b>GROUND TOTAL</b>			<b>514</b>		<b>44,246.55</b>	<b>14</b>	<b>9</b>	<b>7</b>	<b>10</b>	<b>5</b>	<b>10</b>	<b>10</b>	<b>30</b>	<b>12</b>	<b>3</b>

### 3) Section Plan

In principle, the section plan for the Project will inherit that adopted by the previous Phases which was prepared by taking the semi-tropical monsoon climate of Viet Nam into consideration. However, a double roof structure will be employed to improve the heat insulation of the building as agreed during consultations with the Vietnamese side. The ceiling height of 3.3 m for both the ground floor and first floor will be relatively high with a view to enlarging the indoor air volume to suppress a temperature rise and large windows will be incorporated for good natural ventilation and lighting. The floor height of the ground floor will be individually determined for each site based on past flood records in order to prevent flooding of the building in the future. Eaves and horizontal louvres will be introduced above the windows and other openings to prevent both direct sunlight and rain entering the building. A large opening will be introduced in the case of the toilet building to allow odour to escape and to facilitate good natural lighting.

### (3) Structural Plan

#### 1) Structural System

The structural system for the new buildings to be constructed under the Project will be the popular local system, i.e. a rigid pillar and beam structure with cast-in-place concrete. The floor will be a concrete slab floor to compensate for the soft ground and also prevent the banked ground being washed away by flood. The partition walls will be made of burnt bricks. The roof will have a concrete slab base with reinforced brick struts and a wooden roof structure. The wooden structural materials will be treated to deter termites and will be firmly secured to the struts using anchor bolts.

#### 2) Loads and External Force

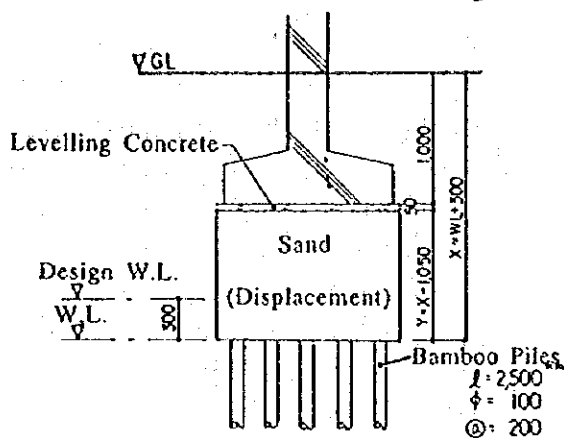
The following design loads will be adopted in accordance with Vietnam's structural design standards (TCVC, 1994), along with the codes of American Concrete Institute and Architectural Institute of Japan.

- |                         |   |                                       |
|-------------------------|---|---------------------------------------|
| ① Live Load             | : | Roof Area ..... 150 kg/m <sup>2</sup> |
|                         |   | Classroom ..... 200 kg/m <sup>2</sup> |
|                         |   | Corridors ..... 400 kg/m <sup>2</sup> |
|                         |   | Stairs ..... 500 kg/m <sup>2</sup>    |
| ② Wind Load             | : | 127 kg/m <sup>2</sup>                 |
| ③ Seismic Load          | : | 0.069 W (W = Dead Load + Live Load)   |
| ④ Soil Bearing Capacity | : | 10 tons/m <sup>2</sup>                |

### 3) Structural Frame Plan

The vertical external force acting on the dead load will be dealt with by RC pillars and beams with a span of 3.8 m × 5.7 m while the horizontal external force will be dealt with by a rigid pillar and beam structure and also by the rigidity of the floor slabs. With regard to the foundations, local bamboo piles will be used for those sites characterised by soft ground and a high regular groundwater table. At sites with a low regular groundwater table, ground improvement work will be employed in addition to the use of bamboo piles. A continuous concrete footing will be used at sites with a relatively high soil bearing capacity. These different types of foundations are illustrated in Fig. 2-1.

A TYPE (Improved Foundation  
For Bamboo Piles, in case of High G.W.L.)



C TYPE (in case of relatively high soil bearing capacity)

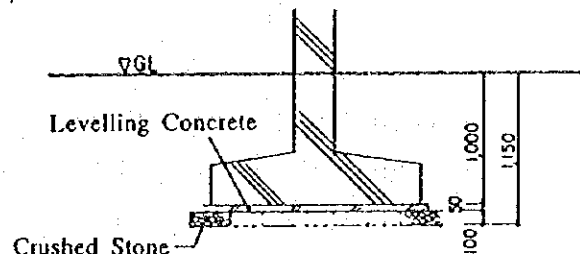


Fig. 2-1 Standard Foundation Types

### 4) Structural Materials

All structural materials will be procured locally and the main items are listed below.

- Cement : normal Portland cement
- Aggregate : crushed stone and river sand
- Reinforcing Bars : round bars, deformed bars, meshed reinforcing bars
- Bricks : structural bricks
- Piles : bamboo piles

#### (4) Building Services Plan

##### 1) Electrical Installation

The planned facilities will be designed in view of the maximum use of natural lighting so that, in principle, daytime teaching will not have any lighting requirement. However, an electrical lighting system will be provided for the evening use of the school buildings for social education and other purposes. In order to keep the maintenance cost reasonably low, the provision of lighting will be limited to the classrooms and staff room using locally procured fluorescent lamps to achieve a luminous intensity of some 200 lux. The classrooms and staff room will also be provided with ceiling fans for use during the particularly hot period from April to September.

##### 2) Water Supply System

A well will be provided at each site as a water supply source for the pumping of groundwater to the storage tank. A water consumption rate of 5 litres/pupil/day is assumed for drinking and cleaning purposes. The water will be purified by a simplified filtering tank. As the manual pump adopted for the Phase I Project has been found to be incapable of providing the required water volume, the electric pump which is popularly used in Viet Nam will be provided.

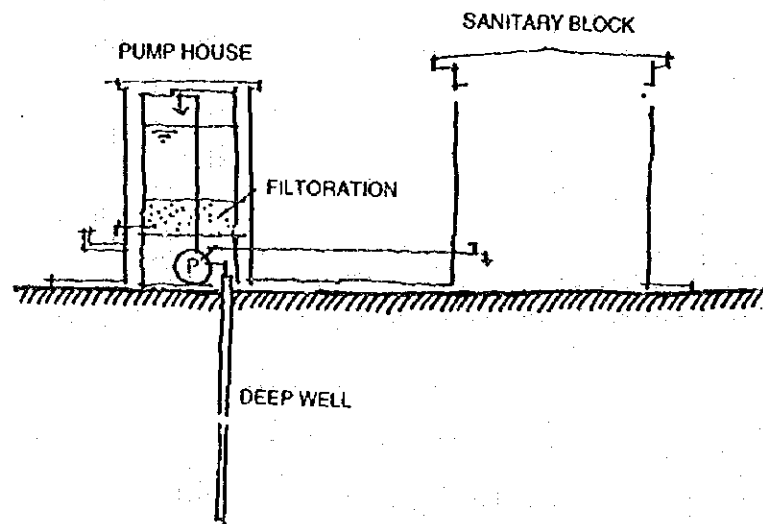


Fig. 2-2 Water Supply System

### 3) Drainage System

As no sewer facilities exist at any of the sites, rainwater will be drained to an irrigation channel, canal or stream near each site. The sewage from the toilets and miscellaneous waste water will be treated in a simplified septic tank and final disposal will be made by means of ground infiltration using a seepage pit and dipping operation. All sanitary fixtures will be procured locally. The closets will be Asian-style closets while the urinals will be the open-type based on local specifications. The toilet floor will have a concrete terrazzo tile finish.

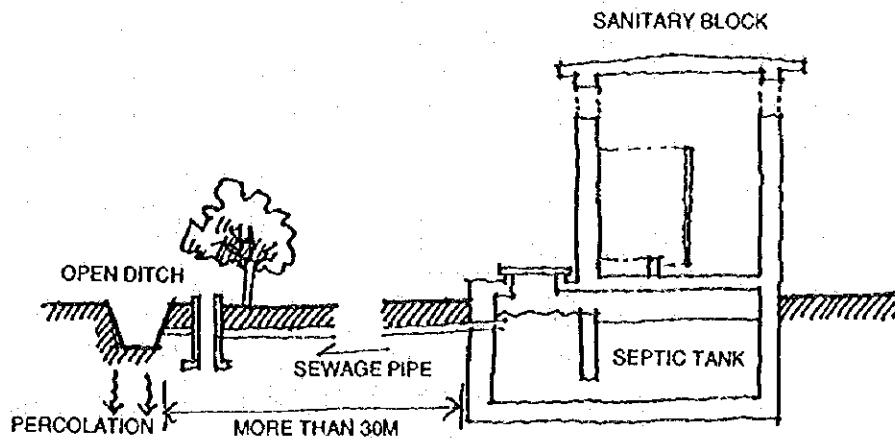


Fig. 2-3 Drainage System

### (5) Construction Materials Plan

#### 1) Basic Principle

The basic principle in terms of the procurement of construction materials under the Project is the use of local materials to allow the use of local construction methods and to ensure easy and low cost maintenance.

#### 2) Main Construction Materials

##### ① Roofing Materials

The common roof structure for schools in Viet Nam consists of a wooden roof truss with roof tiles being directly placed on the wooden rafters. Once this type of roof collapses due to a typhoon, however, the classrooms below are rendered useless. To avoid this, a concrete slab roof will be introduced under the Project with a tiled wooden roof above it for waterproofing and heat insulation purposes. The ridge boards will be firmly fixed to the brick struts built above the concrete slabs using anchor bolts while each roof tile will be tied to the rafter using steel wire to resist typhoons.

② Windows and Doors

Schools in Viet Nam usually have double-leaf, hinged wooden plate windows. These windows are closed when it rains and in cold weather, thus failing to provide any light. Under the Project, glass jalousie windows with a wooden frame will be used in view of good natural lighting and ventilation. Iron grills will also be installed outside the windows for security purposes and to protect the glass. With regard to the doors, popularly used wooden doors will be employed.

③ Floor, Walls and Ceilings

Several types of floor finishings are available in Viet Nam, including mortar, cement tiles and terrazzo. Terrazzo will be used due to their durability and easy maintenance. The walls will have a mortar base with a paint finish. The ceilings will be exposed concrete with a paint finish.

Table 2-7 Main Finishing Materials

Item	Local Specifications	Selected Specifications for the Project	Reasons for Selection
<b>External Finishings</b>			
Roof	tiles (without slabs)	tiles (with slabs)	popularity, weatherability & good heat insulation
External Walls	mortar base with paint finish	as left	easy maintenance
Windows	wooden plate	wooden frame with glass jalousie and iron grill	good lighting, damage prevention & security
Exposed Foundations	mortar	as left	durability & economy
<b>Internal Finishings</b>			
Classrooms Staff Room Headmaster's Office/ Meeting Room Corridor	Floor: mortar/cement tiles/terrazzo Walls: mortar base with paint finish Ceiling: decking	terrazzo as left exposed concrete with paint finish	durability & easy maintenance easy maintenance & workability easy maintenance & workability
Toilets	Floor: mortar Walls: mortar Ceiling: decking	as left mortar base with paint finish as left	easy maintenance & economy easy maintenance & economy workability & economy



## (6) Equipment Plan

The scope of the equipment plan for the Project includes basic school fixtures and teaching materials which are essential for the promotion of primary education, taking the contents of the original request, fixtures, etc. finally provided under the Phase I and Phase II Projects and the findings of the field survey for the Project into consideration.

### 1) School Fixtures

The actual items to be provided as school fixtures under the Project for the classrooms, staff room and meeting room will, in principle, be the same as those provided under the Phase I and Phase II Projects. The specifications of such items will match the standard specifications set by the Ministry of Education and Training and these items will be locally procured, emphasising such factors as the use of local manufacturing skills, ease of raw material availability, good quality and durability. The pupils desks and chairs will be made in 2 sizes to accommodate the different body sizes of the pupils of the lower and upper grades. Table 2-8 shows the range of fixtures to be provided for each room.

### 2) Educational Equipment and Materials

The range of educational materials to be provided and their specifications will be the same as those under the Phase I and Phase II Projects which are compatible with the range of educational equipment and materials employed by the primary school project of the World Bank. All equipment and materials will be procured in Viet Nam. Table 2-9 lists the educational equipment and materials to be provided under the Project for each school.

Table 2-8 Fixtures by Room

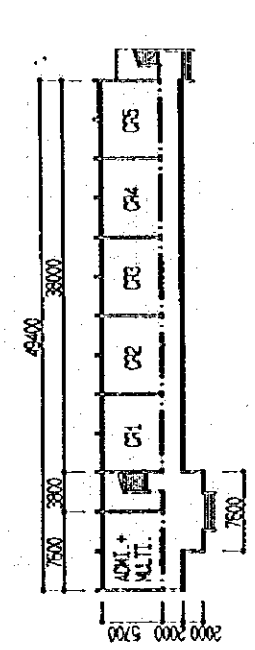
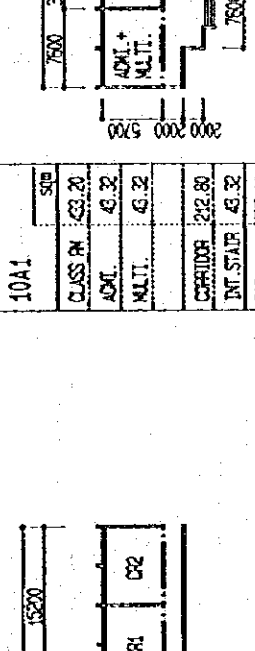
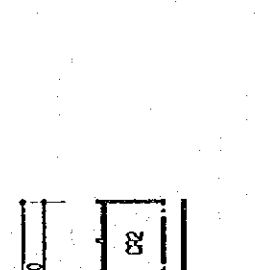
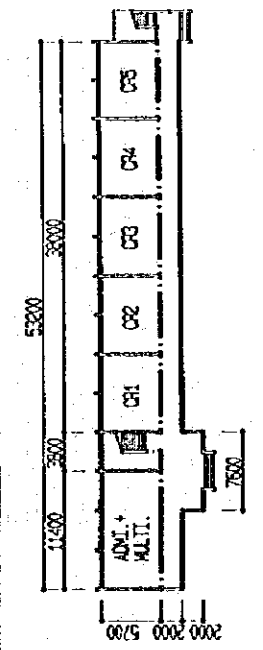
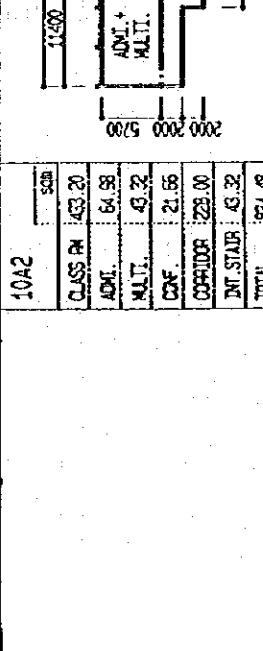

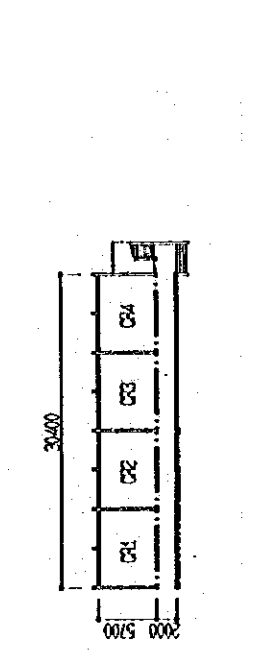
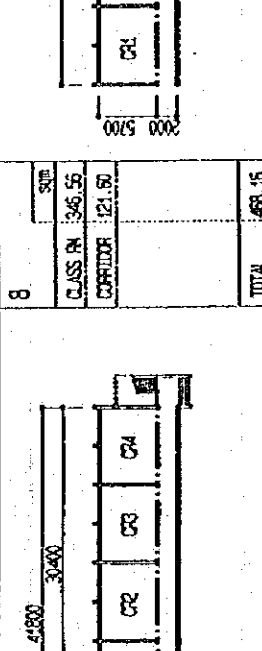
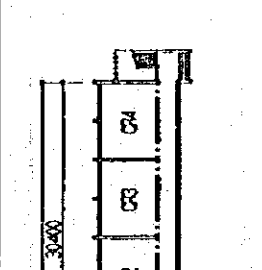
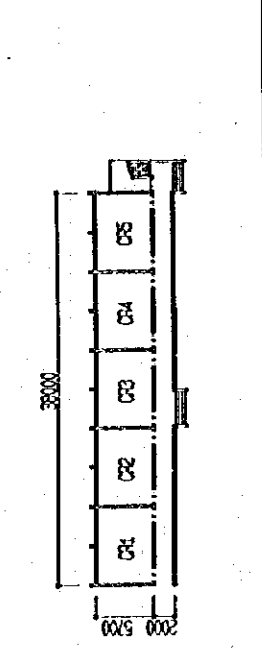
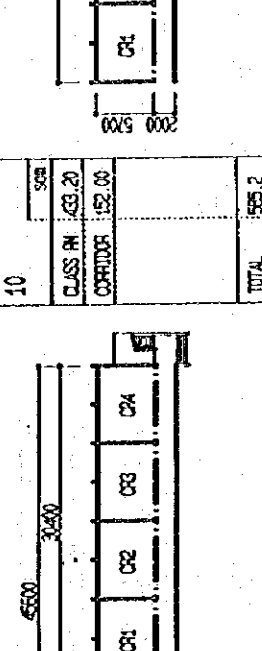
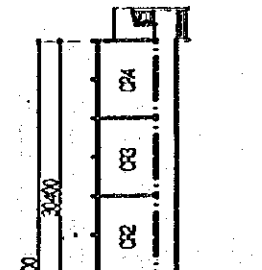
Room	Item	Number
Classroom	Teachers Desk	1
	Teachers Chair	1
	2-Seater Pupils Desks	20
	Pupils Chairs	40
	Cabinet for Classroom equipped with a Tray	1
	Classroom Cabinet	1
	Blackboard	1
Multi-Purpose Classroom	Teachers Desk	1
	Teachers Chair	1
	2-Seater Pupils Desks	20
	Pupils Chairs	40
	Cabinets	2
	Blackboard	1
Staff Room (A1)	Headmasters Desk	1
	Headmasters Chair	1
	Headmasters Cabinet	1
	Teachers Desks	17
	Teachers Chairs	17
	Cabinet	2
	Blackboard	1
Staff Room (A2)	Headmasters Desk	1
	Headmasters Chair	1
	Headmasters Cabinet	1
	Teachers Desks	28
	Teachers Chairs	28
	Cabinet	2
	Blackboard	1
Meeting Room	Table	6
	Chairs	12
	Blackboard	1

Table 2-9

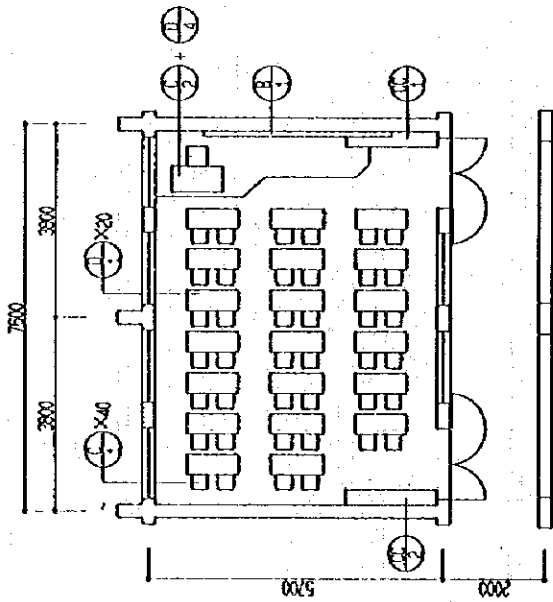
Item No.	Item	Number
<b>I</b>	<b>Textbooks in Vietnamese</b>	
I-1	Textbook on Letters and Numerals (for Grade 1)	2 sets
I-2	Textbook on Vietnamese Language	2 sets
I-3	Textbook on Vietnamese Letters	2 sets
I-4	Textbook on Writing	2 sets
I-5	Textbook on Reading	2 sets
I-6	Textbook on Vietnamese Language (for Grade 2)	2 sets
I-7	Textbook on Vietnamese Language (for Grade 3)	2 sets
I-8	Textbook on Vietnamese Language (for Grade 4)	2 sets
I-9	Textbook on Vietnamese Language (for Grade 5)	2 sets
<b>II</b>	<b>Teaching Tools for Arithmetic</b>	
II-10	Steel Board (40 cm × 30 cm)	2
II-11	Magnet (Ø 15 mm)	60
II-12	Abacus (2 rows)	2
II-13	Abacus (3 rows)	2
II-14	Balance (200 g)	one set
II-15	Clock Board	2
II-16	Measuring Tools <ul style="list-style-type: none"> <li>• Compass</li> <li>• Set Square (triangular square)</li> <li>• Protractor</li> <li>• Straight Ruler</li> </ul>	2 2 2 2
II-17	Plastic Measuring Cup (1,000 cc)	2 sets
II-18	Set of teaching materials to explain volumetric principles	2 sets
II-19	Set of teaching materials to explain cubic principles	2 sets
<b>III</b>	<b>Miscellaneous Items</b>	
III-20	Wall Clock	1
III-21	Azimuth Compass	1
III-22	Globe	1
III-23	Hydroturbine Model	1
III-24	Gyroscope	1
III-25	Wind Vane	1
III-26	Viet Nam Administrative Map	one set
III-27	Viet Nam Geographical Map	one set
III-28	Simple Tool Set (hammer, pliers and screwdrivers, etc.)	one set
III-29	Gear Model	one set
III-30	Textbook on History of Viet Nam (for Grade 4)	one set
III-31	Textbook on History of Viet Nam (for Grade 5)	one set
III-32	Mandolin	1
III-33	Bamboo Pipe	40
III-34	Magnifier	2 sets
III-35	Model Teeth	1
III-36	Reference Books for Primary School <ul style="list-style-type: none"> <li>• World Map</li> <li>• Dictionary</li> <li>• Pictorial Encyclopedia</li> </ul>	1 1 1
III-37	Organ	1

**(7) Basic Design Drawings**

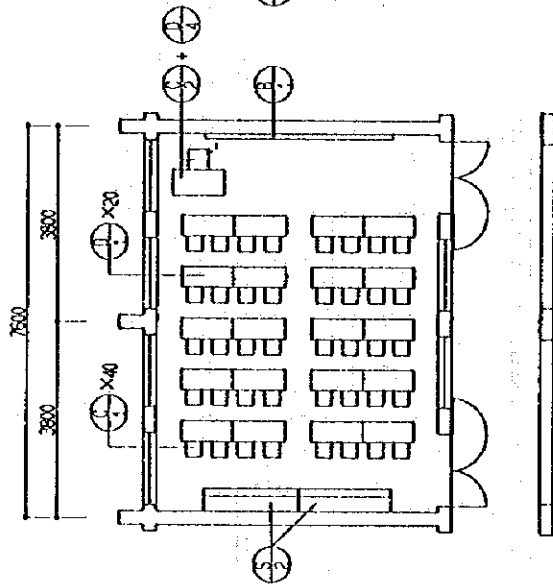
- 1) COMBINATION UNIT PLAN**
- 2) FURNITURE LAYOUT PLAN**
- 3) TYPICAL PLAN**
- 4) TYPICAL ELEVATIONS**
- 5) WALL SECTION**
- 6) SANITARY BLOCK PLAN**

<p>4A2</p> <table border="1"> <tr><td>SUB</td><td>173.28</td></tr> <tr><td>CLASS RM</td><td>64.98</td></tr> <tr><td>ADM.</td><td>43.32</td></tr> <tr><td>MULT.</td><td>21.66</td></tr> <tr><td>CONF.</td><td>136.8</td></tr> <tr><td>CORRIDOR</td><td>43.32</td></tr> <tr><td>INT. STAIR</td><td>43.32</td></tr> <tr><td>TOTAL</td><td>483.36</td></tr> </table> 	SUB	173.28	CLASS RM	64.98	ADM.	43.32	MULT.	21.66	CONF.	136.8	CORRIDOR	43.32	INT. STAIR	43.32	TOTAL	483.36	<p>10A1</p> <table border="1"> <tr><td>SUB</td><td>433.20</td></tr> <tr><td>CLASS RM</td><td>64.98</td></tr> <tr><td>ADM.</td><td>43.32</td></tr> <tr><td>MULT.</td><td>21.66</td></tr> <tr><td>CORRIDOR</td><td>212.80</td></tr> <tr><td>INT. STAIR</td><td>43.32</td></tr> <tr><td>TOTAL</td><td>775.96</td></tr> </table> 	SUB	433.20	CLASS RM	64.98	ADM.	43.32	MULT.	21.66	CORRIDOR	212.80	INT. STAIR	43.32	TOTAL	775.96	<p>W1</p> <p>40,000sq ft</p> <p>C 3'x2'-6 U: 10'x2'-0</p> 
SUB	173.28																															
CLASS RM	64.98																															
ADM.	43.32																															
MULT.	21.66																															
CONF.	136.8																															
CORRIDOR	43.32																															
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MULT.	21.66																															
CORRIDOR	212.80																															
INT. STAIR	43.32																															
TOTAL	775.96																															
<p>8A1</p> <table border="1"> <tr><td>SUB</td><td>346.56</td></tr> <tr><td>CLASS RM</td><td>64.98</td></tr> <tr><td>ADM.</td><td>43.32</td></tr> <tr><td>MULT.</td><td>21.66</td></tr> <tr><td>CORRIDOR</td><td>182.4</td></tr> <tr><td>INT. STAIR</td><td>43.32</td></tr> <tr><td>TOTAL</td><td>658.92</td></tr> </table> 	SUB	346.56	CLASS RM	64.98	ADM.	43.32	MULT.	21.66	CORRIDOR	182.4	INT. STAIR	43.32	TOTAL	658.92	<p>10A2</p> <table border="1"> <tr><td>SUB</td><td>453.20</td></tr> <tr><td>CLASS RM</td><td>64.98</td></tr> <tr><td>ADM.</td><td>43.32</td></tr> <tr><td>MULT.</td><td>21.66</td></tr> <tr><td>CONF.</td><td>228.00</td></tr> <tr><td>CORRIDOR</td><td>43.32</td></tr> <tr><td>INT. STAIR</td><td>43.32</td></tr> <tr><td>TOTAL</td><td>834.48</td></tr> </table> 	SUB	453.20	CLASS RM	64.98	ADM.	43.32	MULT.	21.66	CONF.	228.00	CORRIDOR	43.32	INT. STAIR	43.32	TOTAL	834.48	<p>W2</p> <p>53,750sq ft</p> <p>C 3'x2'-8 U: 14'x2'-8</p> 
SUB	346.56																															
CLASS RM	64.98																															
ADM.	43.32																															
MULT.	21.66																															
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SUB	346.56																															
CLASS RM	64.98																															
ADM.	43.32																															
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SUB	346.56																															
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SUB	452.00																															
CLASS RM	152.00																															
CORRIDOR	565.2																															
TOTAL	1169.2																															

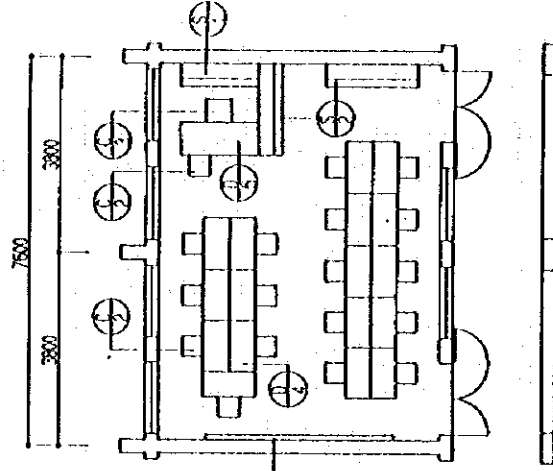
COMBINATION UNIT PLAN



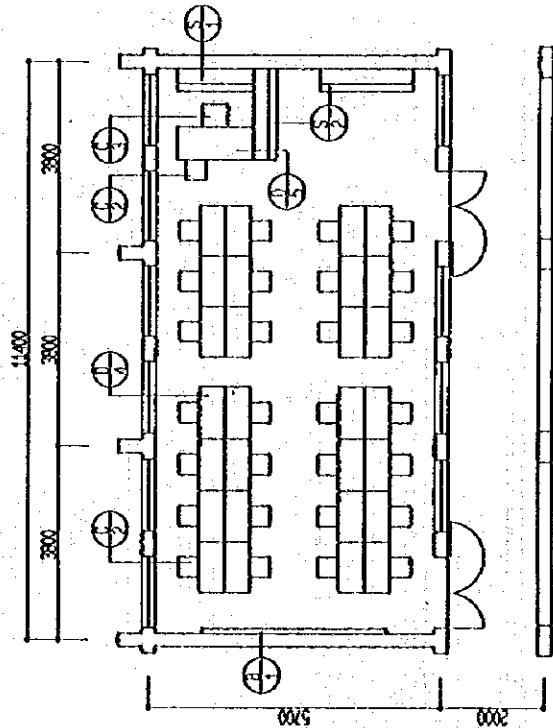
CLASS ROOM UNIT 43.32sqm (65-46SEATS)



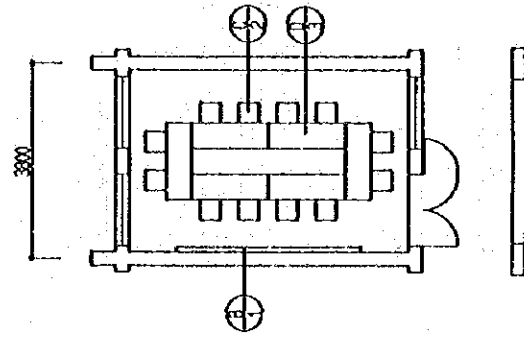
MULTIPURPOSE UNIT 43.32sqm (66-46SEATS)



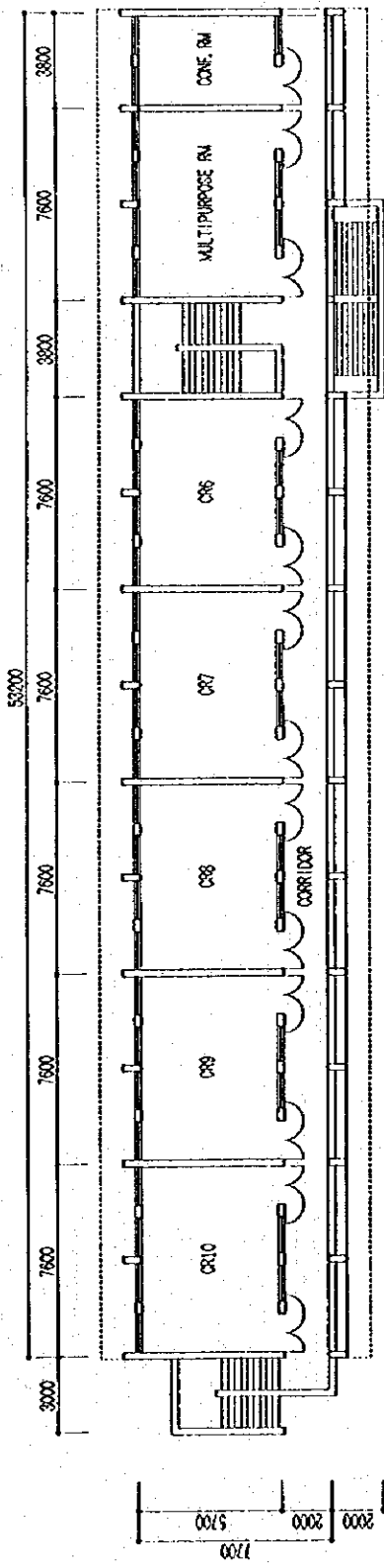
ADMINISTRATION (A1) UNIT 43.32sqm (6-17CLASS)



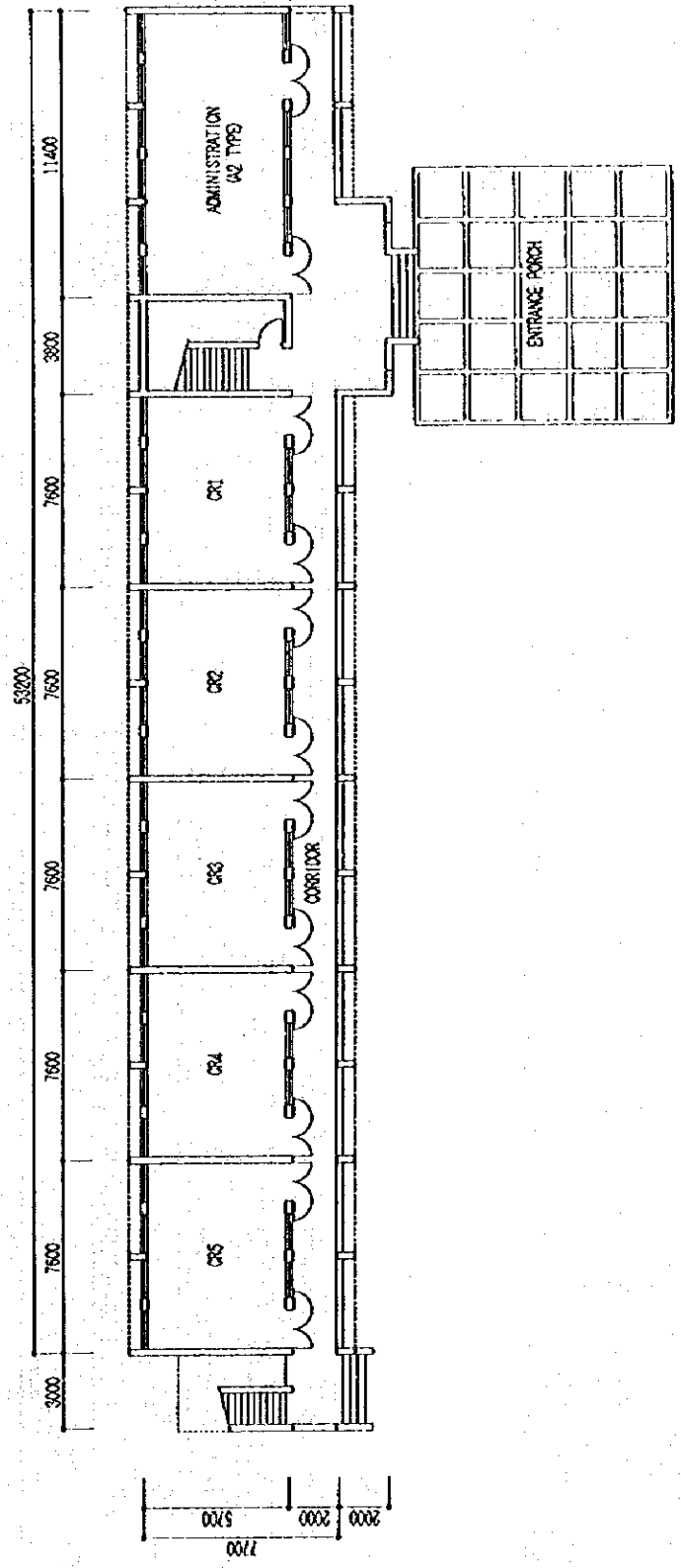
ADMINISTRATION (A2) UNIT 64.98sqm (180CLASS)



CONFERENCE ROOM UNIT 21.66sqm (180CLASS)



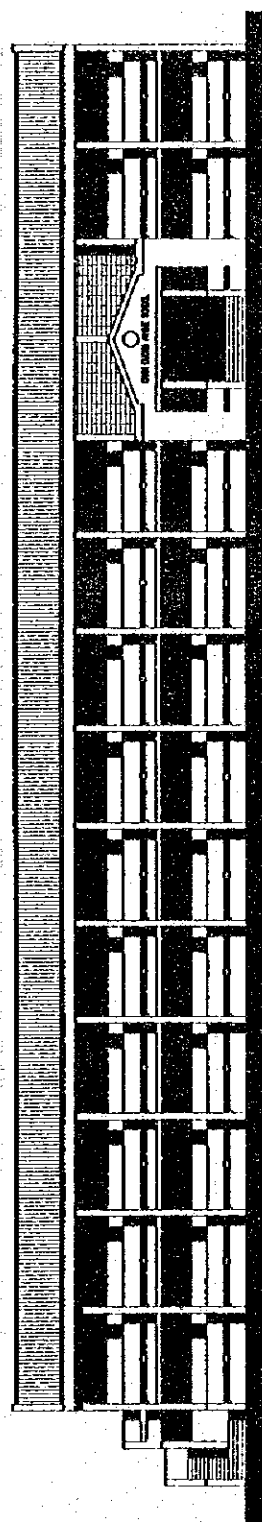
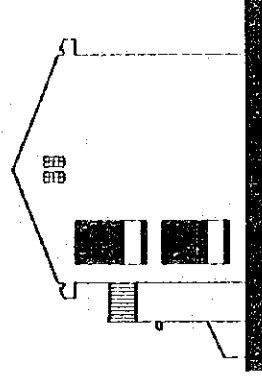
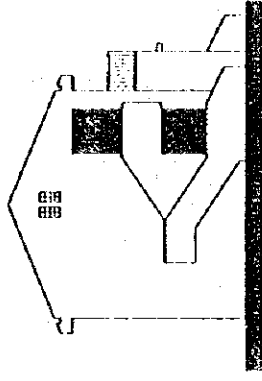
1ST FLOOR PLAN



GROUND FLOOR PLAN

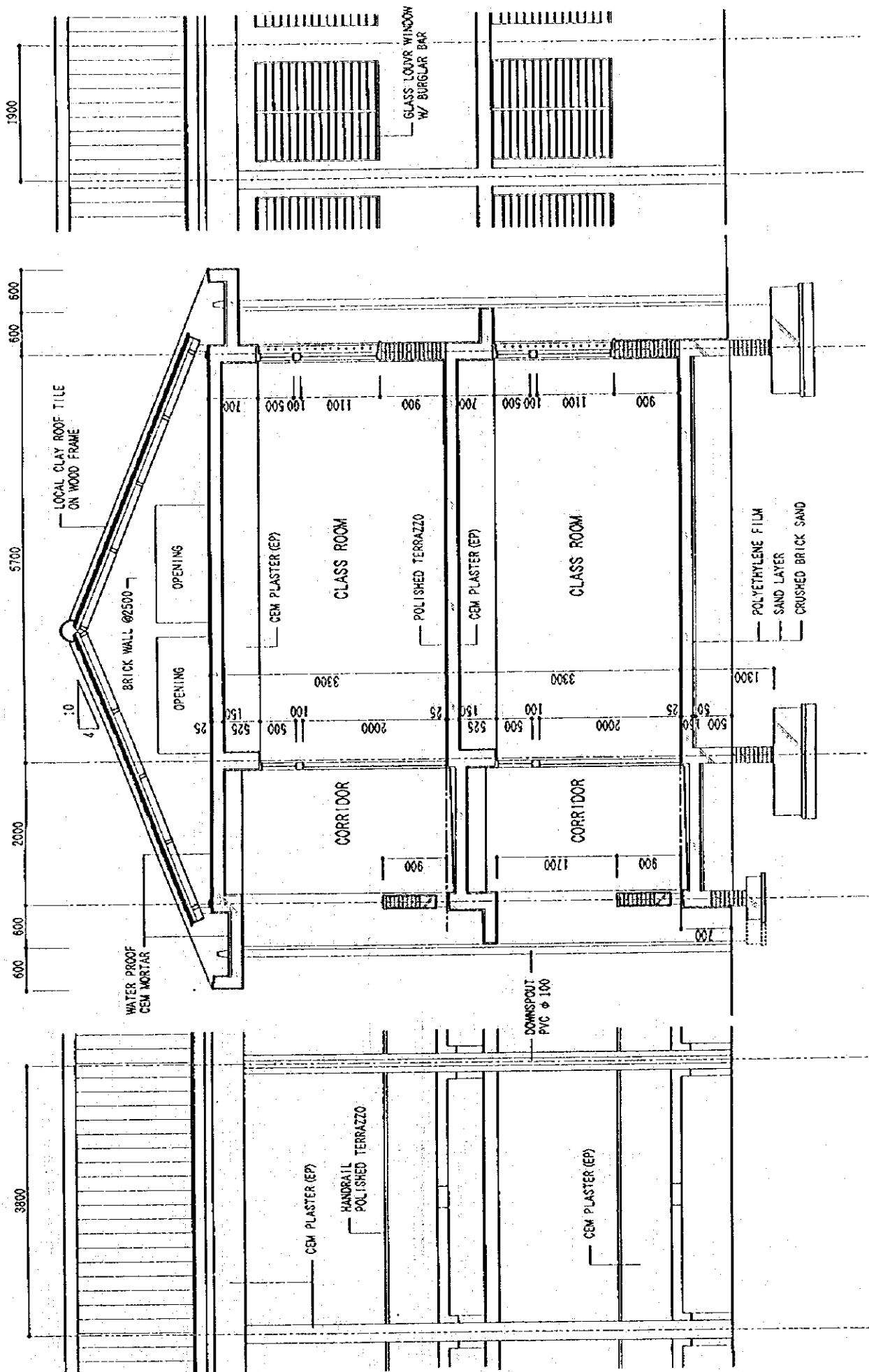
TYPICAL PLAN

1/200



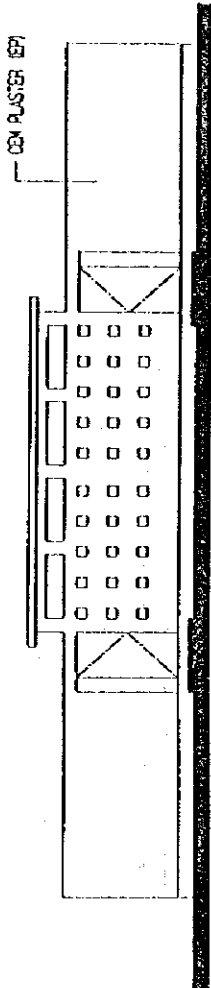
TYPICAL ELEVATIONS  
1/200



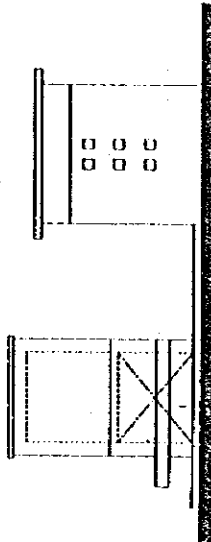


WALL SECTION

1/50



ELEVATION

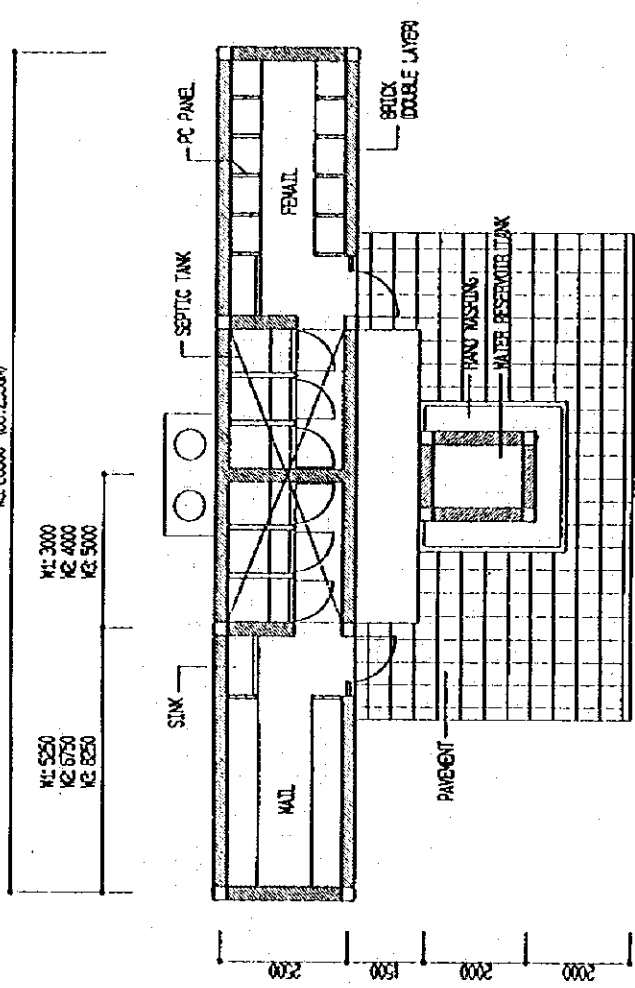


ELEVATION

W1: 16500 (40.0050M)  
 W2: 21500 (53.7550M)  
 W3: 26500 (66.2550M)

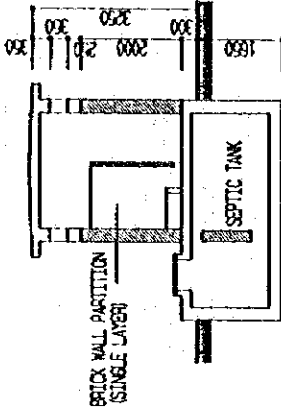
H1: 3000  
 H2: 4000  
 H3: 5000

H4: 5250  
 H5: 6750  
 H6: 8250

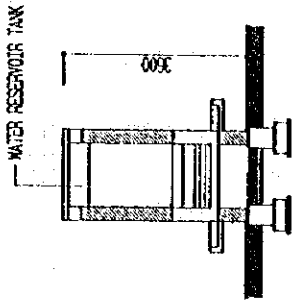


PLAN

H1: 4000  
 H2: 5000  
 H3: 6000



SECTION

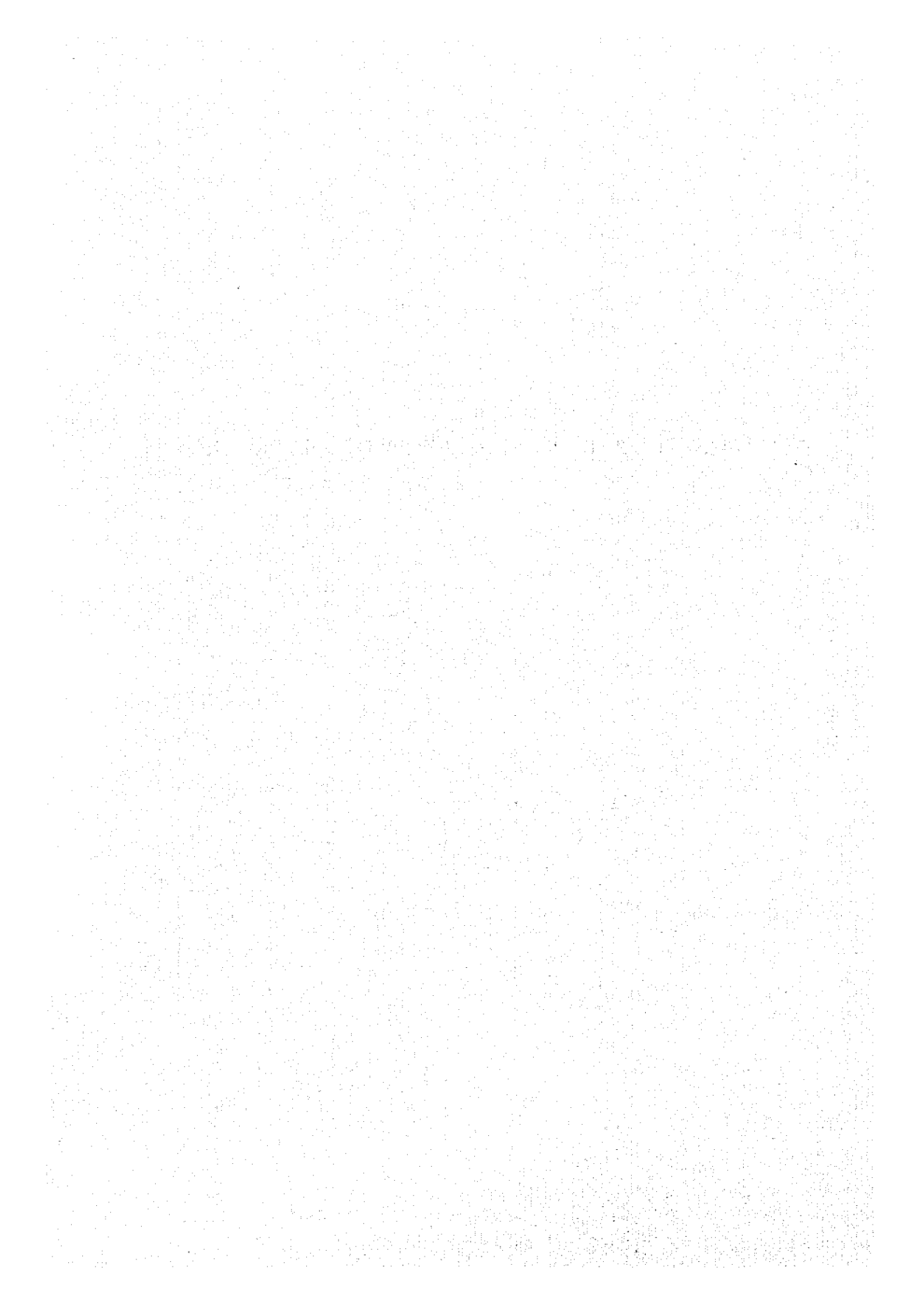


SECTION

SANITARY EQUIPMENT

- X1 K C-3 U-10 E C-3 U-10 X30x65
- X2 K C-4 U-14 E C-4 U-14 X12x65
- X3 K C-5 U-18 E C-5 U-18 X 3'x65

## **CHAPTER 3 IMPLEMENTATION OF THE PROJECT**



## **CHAPTER 3 IMPLEMENTATION OF THE PROJECT**

### **3.1 Implementation Plan**

#### **3.1.1 Implementation Principles**

##### **(1) Basic Framework for Project Implementation**

The actual implementation of the Project, i.e. the Project for Improvement of the Facilities of Primary Schools (Phase III) in the Socialist Republic of Viet Nam, will require the cabinet approval of the Government of Japan following examination of the details of the Project by the Japanese government organizations concerned provided by the present Basic Design Report. After such a decision has been made, the Exchange of Notes (E/N) will be signed by the Government of Japan and the Government of Viet Nam to proceed to the implementation stage. The Project will then be implemented in accordance with the agreements concluded between the Project Implementation Agency in Viet Nam and the Japanese Consultant and Japanese Contractor pursuant to the grant aid system of the Government of Japan. These 2 separate agreements will be required to be certified by the Government of Japan.

##### **(2) Project Implementation System**

The party to the E/N regarding the implementation of the Project on the Vietnamese side will be the Ministry of Foreign Affairs while the Project Implementation Agency will be the Ministry of Education and Training. The Project Management Committee, headed by the First Vice-Minister of the Ministry of Education and Training, will have the actual management responsibility for the Project. The party on the Vietnamese side to the design and supervision agreement with the Consultant and to the construction agreement with the Contractor will be the Ministry of Education and Training. The Project Management Committee will also be responsible for land preparation and power supply at all the subject sites even though the work will be directly conducted by the Provincial and District People's Committees governing these sites. The work involving the special technologies required by the planned facilities will be arranged by the Institute for Research and Design of Schools in its capacity of a member of the Project Management Committee.

##### **(3) Consultant**

Following the signing of the E/N by the two governments, the Ministry of Education and Training will conclude a design and supervision agreement, involving the detailed design

and supervision of the construction work, with a Japanese consultancy firm. In view of the smooth progress of the Project, the Consultant involved in the basic design of the Project will be awarded a contract to conduct the detailed design and construction work supervision. Upon certification of the agreement by the Government of Japan, the Consultant will conduct the detailed design for the planned facilities and equipment, etc. through consultations with the Project Management Committee of the Ministry of Education and Training, will expand the findings of the Basic Design Report and will also prepare the tender documents. Following approval of the detailed design and tender documents by the Ministry of Education and Training, the Consultant will conduct the tender procedure to select the Contractor on behalf of the Project Implementation Agency, i.e. Ministry of Education and Training, and will also supervise the entire construction work conducted by the Contractor.

(4) Contractor

The work of the Contractor will consist of the construction of the school facilities and procurement of educational equipment and materials. The successful Contractor will be selected through open competitive bidding held for Japanese construction companies with the appropriate qualifications. In principle, the lowest bidder will be declared successful and will conclude a construction agreement with the Ministry of Education and Training. Upon certification of the construction agreement by the Government of Japan, the Contractor will complete the construction work within the period specified by the agreement and will hand over the completed facilities, together with the duly procured educational equipment and materials, to the Ministry of Education and Training after inspection of their satisfactory condition.

(5) Areas of Work for Local Consultant and Sub-Contractors

Many private consultancy and construction companies have been established in Viet Nam since the introduction of market economy principles. However, their achievements so far do not appear good enough vis-a-vis undertaking a major project. In the case of a major construction project for primary school facilities such as the Project, the organization with the highest technical capability and experience to act as a consultant for the Project is the Institute for Research and Design of Schools of the Ministry of Education and Training. As the said Institute has the dual character of a subordinate organization of the Ministry of Education and Training and a business enterprise, it will be able to jointly work with the Japanese Consultant to prepare the detailed design drawings or can be commissioned to conduct some of the work involved. The Institute can also provide assistant supervisors to assist the Consultant with the supervision work. The appointment of people conversant with the primary school building specifications in Viet Nam is

deemed appropriate as they will be able to assist the on-site staff members of the Consultant to efficiently conduct the supervision of the application of uniform technical standards given the many construction sites under the Project.

Local construction companies include those controlled by the Ministry of Construction and Ministry of Transport and Telecommunications and private companies. Both public and private construction companies have been acquiring expertise and experience in recent years with the injection of foreign capital. These companies will act as sub-contractors for the Japanese Contractor in the implementation of the construction work under the Project. Although the construction work size at each site under the Project is small, the overall construction work size is quite large because of the involvement of 45 sites in 3 provinces. Given the capability and experience of local companies, the appropriate division of the Project Area is desirable in view of the appointment of a local sub-contractor for each area. The establishment of uniform work processes is essential in order to complete the construction work at all sites on time and the use of Japanese process control techniques, etc. should prove both necessary and decisive.

### **3.1.2 Implementation Conditions**

#### **(1) General Conditions of Local Construction Industry and Regional Characteristics**

##### **1) Local Construction Industry**

The 3 coastal provinces in the northern-central part of Viet Nam where the Project will be implemented are known as areas of less socioeconomic development together with mountainous provinces in the north. The main local industries are agriculture and marginal coastal fisheries. Apart from Hue, a major city in the central part of Viet Nam, the construction demand is low except for some public works, minor business facilities and housing development. The development of such infrastructure components as roads, bridges and river improvement works in these provinces also lags behind other provinces. Construction-related local industries include brick-making and the manufacture of roof tiles. Construction timber is also produced locally. The local construction companies are public companies which belong to the Ministry of Construction and Ministry of Transport and Telecommunications, the operation of which is supervised by the People's Committee of each province, and some private companies established since the introduction of a market economy.

## 2) Labour Conditions

There tends to be a general surplus of simple labourers in rural and mountainous areas while there is a shortage of skilled workers who are specialised in structural work, finishing work and building services work. As the subject areas of the Project are not far from Da Nang, local construction workers have a general understanding of systematic building processes based on past experience. Nevertheless, it is essential that local construction methods and materials with which local construction workers are familiar mainly be used with effective and appropriate technical improvements. In order to complete the construction work on time at the many sites anticipated by the Project while maintaining a uniform technical level, the services of a sufficient number of skilled workers should be secured through multiple local sub-contractors, backed by the assignment of many foremen to be responsible for the direct guidance and control of site workers, so that Japanese systematic work control techniques can be transferred to the Vietnamese side.

Another important point for the Contractor is the direct employment of many workers in addition to those employed by the local sub-contractors to ensure the smooth progress of the simultaneous construction work at many sites spreading over 3 provinces.

## 3) Construction Materials

The construction material procurement priority is placed on local materials to facilitate the post-project maintenance of the new facilities. To secure a stable supply of the main materials, i.e. cement and reinforcing bars, supply routes from Da Nang and other cities should be established in addition to primary procurement routes within the 3 subject provinces in which the Project will be implemented.

Common wall bricks, roof tiles and floor materials are sufficiently available in each subject province. While 3 - 5 mm thick glass is available locally, a supply route from Hanoi should be considered for mass procurement. While aluminium window frames, etc. are available, high quality products are fairly expensive, making wooden louvre windows popular. However, locally produced wooden window frames, etc. have problems of (i) unreliable precision due to uneven timber quality and insufficient drying and (ii) inadequate anti-termite treatment, etc.

Forms are generally made of wooden boards. The materials used for temporary construction, such as supporting materials and scaffolding, are usually made to timber, logs and bamboo. Steel supports are seldom used except for major construction work.



As reviewed above, almost all of the construction materials required for the construction work of the planned size under the Project can be obtained locally.

#### 4) Transportation Conditions

Many of the planned school construction sites under the Project are located within a some 10 km distance of national route A1, the conditions of which are generally good except for the use of the ferry service over Giang River in Quang Binh Province due to a lack of bridges. There is chronic traffic congestion at these crossing points, mainly due to a large number of lorries. The conditions of national route 9 in Quang Tri Province along which some of the sites are located are also good and travelling at a speed of 60 km/hr is possible. Although local roads have no special problems, the total length of the local roads providing access to the school sites is 280 km which is some 3.5 times longer than the 80 km under the Phase I Project.

#### (2) Points to Note for Construction Work

The following points must be particularly noted in the construction of the planned school facilities under the Project.

- 1) The construction plan must ensure punctual and efficient construction work in order to complete the work at a large number of sites distributed in a geographically wide area (3 provinces) without compromising the construction standards.
- 2) The construction sites are largely classified as new sites and existing primary school sites. In the case of the latter, the construction plan must ensure the safety of children, etc. during the construction period and the school management at each site must be properly consulted in this regard.
- 3) Prior to the actual work, a demonstration of each type of work should be conducted so that the workers involved properly understand the principles, processes and objectives, etc. of the work. This demonstration will act as not only vocational training but also as the transfer of technology from Japan.
- 4) During the construction period, a monthly work progress meeting should be held with the participation of members of the School Construction Committee at the central government level (Ministry of Education and Training), provincial government level (Education and Training Bureau) and district authority level (Education and Training Office) and representatives of the People's Committees.

This regular meeting should be designed to provide detailed reporting on the work progress to the Vietnamese side in order to facilitate the latter's understanding of and cooperation for the work and to ensure proper budgetary appropriation, etc. by the latter.

- 5) The selection of local sub-contractors should, in principle, be based on judgement of the capability of provincial level construction companies.
- 6) The quality and quantitative availability of local construction materials must be carefully checked and multiple supply sources should be established to stimulate competitive pricing and also to ensure a stable supply.
- 7) The Project requires the construction of 514 classrooms and other buildings as well as the mass manufacture of school fixtures, windows and doors, etc. in a short period of time. Because of the lack of a local timber plant capable of conducting integrated work, from the purchase of logs to processing and curing, a new timber plant will be constructed, as in the case of the Phase I Project, to prepare for the mass production of school fixtures, windows and doors.
- 8) In the case of a site which is known to have a history of submersion at the time of flooding, the final decision on the ground elevation and ground floor height must be very carefully made.
- 9) The following points must be carefully examined with a view to making improvements in terms of uneven floor subsidence, ground floor condensation, structural precision, quality control of windows and doors, etc. and manufacturing precision of desks and chairs, etc.
  - i) Ground : A geological survey should be conducted (by the Vietnamese side) at those sites which are judged to have soft ground due to their location in paddy fields, the vicinity of a rivermouth or river channel or in a swamp and which have a relatively high normal groundwater table with a view to conducting ground improvement work and foundation work using bamboo piles, etc. to create a sufficient soil bearing capacity. Following the ground improvement work, a simplified loading test should be conducted to confirm a soil bearing capacity of 10 tons/m<sup>2</sup>.

- ii) Foundations : The brick masonry continuous footing should be improved to continuous concrete footing with brick masonry work.
- iii) Slab-on-Earth : Slab-on-earth should be employed and the standard ground floor height should be 700 mm from the ground level (GL). Condensation on the ground floor should be prevented through the use of a damp-proof film.
- iv) Structure : The brick masonry walls should be replaced by a RC rigid frame with a brick masonry walls.
- v) Floor : The conventional concrete slab floor should be used.
- vi) Roof : The concrete roof slabs should be covered by a wooden roof truss with roof tiles. Measures to prevent damage due to typhoons should be adopted, including fastening of the roof tiles to the roof truss, etc. by steel wire.
- vii) Finishing : Instead of the local finishing using mortar mixed with lime which does not have sufficient strength, normal mortar finishing should be employed with a highly weatherable resin pain finish.
- viii) Windows and Doors : Emphasis should be placed on a high wood quality and uniform standard. Anti-termite treatment and wood drying should be thoroughly conducted. Through the establishment of a wood processing factory, the mass production of high quality timber should be achieved under the technical guidance of Japanese experts.
- ix) Temporary Structures : In principle, local methods should be used although strong guidance should be provided for local sub-contractors so that they understand the need to improve the form materials, temporary construction methods and use of surveying equipment and also to strictly control the precision in terms of horizontal and vertical centering and to implement the improved work.
- x) Work Control : Systematic process control and work control techniques should be introduced through transfer from the Japanese to the Vietnamese side.

### 3.1.3 Scope of Work

The adoption of the following division of work between the Government of Viet Nam and Government of Japan appears appropriate in relation to the planned construction work under the Project.

#### (1) Work to be Undertaken by Japanese Side

##### 1) Construction of Facilities

Construction of the following types of primary schools consisting of a classroom building (classrooms, multi-purpose classroom and staff room) and toilet building and a water supply system using a well.

School Type	Number of Schools
8-Classroom School	11 schools (88 classrooms)
10-Classroom School	14 schools (140 classrooms)
12-Classroom School	6 schools (72 classrooms)
14-Classroom School	8 schools (112 classrooms)
16-Classroom School	3 schools (48 classrooms)
18-Classroom School	3 schools (54 classrooms)
Total	45 schools (514 classrooms)

##### 2) Provision of Equipment

Provision of such school fixtures as teacher and pupil desks and chairs, cabinets and blackboards and educational equipment, including organs and textbooks, etc.

#### (2) Work to be Undertaken by Vietnamese Side

##### 1) Securing of the construction sites.

2) Site survey and boring survey at the 14 sites agreed upon at the Basic Design Study stage (these surveys must be conducted and their findings presented to the Japanese Consultant prior to the commencement of the Detailed Design stage).

3) Land preparation, banking and removal of existing buildings and structures obstructing the construction work prior to the commencement of the construction work.

4) Provision of proper road access to each site.

5) Supply of electricity to each site.

- 6) Incidental outdoor work, such as ground preparation, landscaping, fencing and exterior lighting, etc.
- 7) Bearing of bank commission arising from the banking arrangements.
- 8) Provision of the necessary permission, licenses and other authorisation required for implementation of the Project.
- 9) Ensuring of the prompt unloading, tax exemption and customs clearance at the port of disembarkation in Viet Nam and prompt internal transportation of the materials and equipment to be provided by Japanese grant aid for the Project.
- 10) Exemption of Japanese and other nationals engaged in the supply of products or facility construction from customs duties, domestic taxes and fiscal levies in Viet Nam.
- 11) Accordance of all necessary facilities for Japanese and other nationals vis-a-vis their stay in Viet Nam upon their arrival in Viet Nam to conduct Project-related work pursuant to the certified agreements.
- 12) Securing of appropriate budget and manpower to maintain the facilities to be constructed and equipment, etc. to be provided by Japanese grant aid in a proper, effective manner.
- 13) Bearing of all expenses necessary to implement the Project other than those covered by the Japanese grant aid.

### **3.1.4 Consultant Supervision**

#### **(1) Basic Principles for Detailed Design and Work Supervision**

The Consultant for the Project, responsible for the detailed design of the facilities and equipment for the Project, will be selected by the Ministry of Education and Training of the Government of Viet Nam from among Japanese consultants with the necessary experience in educational facility projects as well as grant aid projects and, therefore, which are capable of performing the required consultancy work for the Project. The selected Consultant will conduct the detailed design of the planned facilities and equipment through consultations with the Government of Viet Nam, taking the findings of the Basic Design Study into consideration, and will prepare the necessary tender documents. At the supervision stage of the construction work and equipment installation work, etc., the Consultant will appoint full-time, on-site supervisors to provide the

necessary guidance for the Contractor and sub-contractors and to liaise with members of the School Construction Committee which represent the Ministry of Education and Training, Education Bureau of the Provisional People's Committee, Education Office of the District People's Committee, Commune People's Committee and the schools in question and with other government ministries involved in the Project. The Consultant is expected to conduct the following work.

- 1) Detailed design (preparation of tender documents, such as specifications and detailed drawings, for the construction work and equipment installation work, etc.)
- 2) Arrangements for the tender process and construction agreement (preparation of construction agreement guidelines and draft construction agreement, preparation of construction work details, announcement of tender, pre-qualification work, tender supervision, assessment of bids, selection of Contractor, agreement negotiations on behalf of the client (Ministry of Education and Training) and witnessing of the agreement).
- 3) Inspection and approval of the drawings, etc. submitted by the Contractor (inspection and approval/disapproval of shop drawings, construction plan and samples of construction materials, building service materials and equipment to be submitted by the Contractor).
- 4) Work supervision (examination of the construction plan and construction schedule and provision of guidance for the Contractor).
- 5) Reporting of work progress (reporting of the work progress to the Ministry of Education and Training and other related organizations) and management of monthly meetings to be attended by representatives of the central government, provincial government, School Construction Committee and the Contractor).
- 6) Provision of assistance for the payment approval process (examination of invoices for various components of the construction work payable during the construction period and following the completion of the work).
- 7) Witnessing of inspection (inspection of work quantity completed at various stages between the commencement and completion of the construction work and inspection of work quality).

## **(2) Supervision Regime**

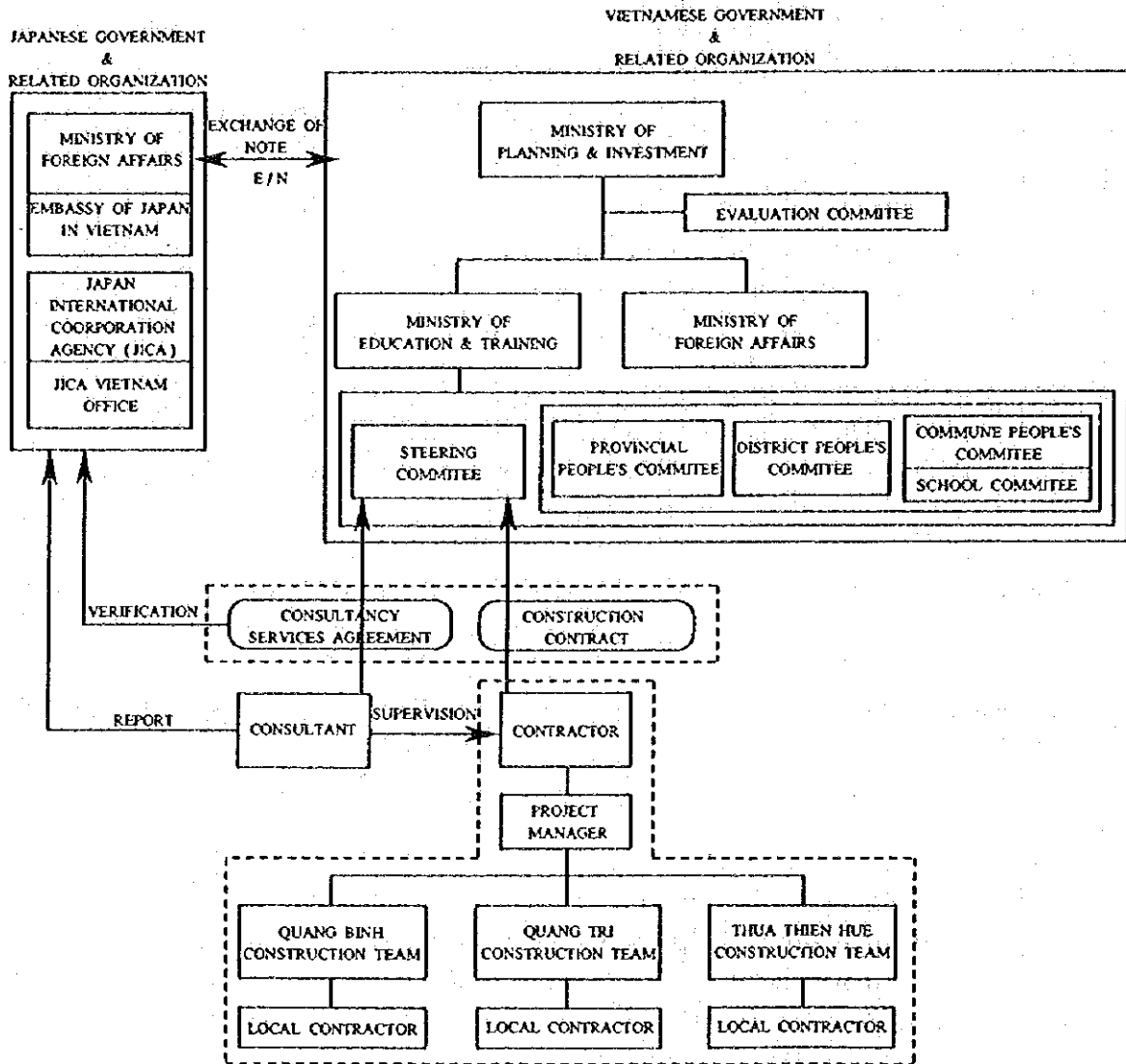
The Consultant will assign 2 Japanese engineers and 3 local engineers as full-time staff members to provide appropriate guidance on the quality, progress and safety of the construction work, etc. which will be conducted at 45 different sites in 3 provinces and to coordinate the work with the school authorities as well as with the district, provincial and central government organizations in view of the smooth completion of the construction work, etc. as envisaged by the design documents within the specified construction period. Moreover, additional experts will be dispatched from Japan at appropriate times. The scope of work of each of these 3 full-time Japanese engineers is as follows.

- **Architectural Engineer** : Examination and approval of the colour scheme, material samples and shop drawings and inspection of the final handing-over
- **Structural Engineer** : Confirmation of and guidance on the land clearance, ground improvement and foundation work
- **Building Services Engineer** : Guidance on the building services work and inspection of the final handing-over

## **(3) Work Supervision Regime**

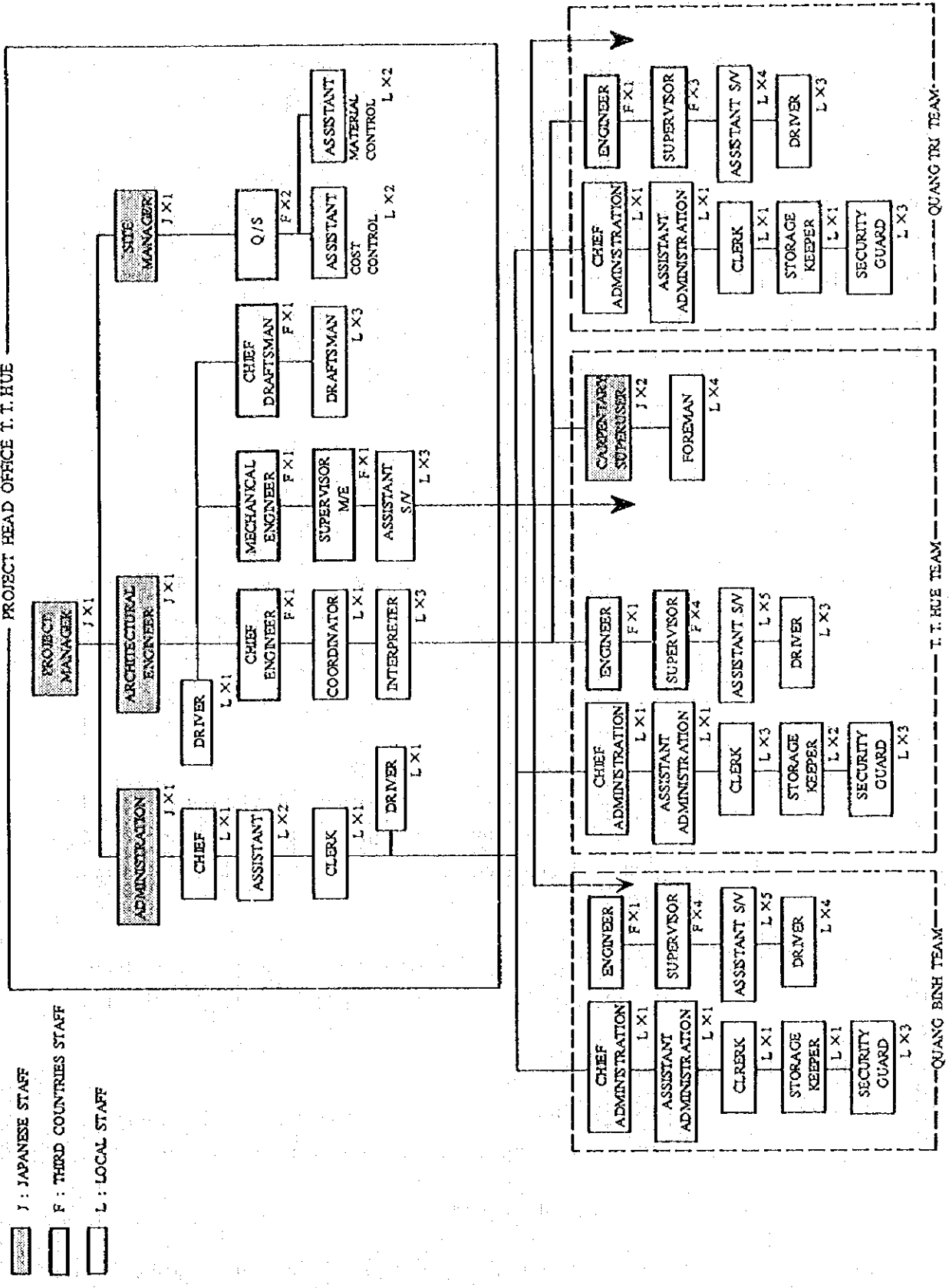
Based on the experience obtained during the Phase I and Phase II Projects, the assignment of the following full-time staff members for specified periods will be required to ensure the completion of the construction work at all 45 sites in 3 provinces within the construction period.

Fig. 3-1 Project Management Organization Chart





PROJECT HEAD OFFICE T. T. HUE



- J : JAPANESE STAFF
- F : THIRD COUNTRIES STAFF
- L : LOCAL STAFF

### 3.1.5 Procurement Plan

In principle, all the main construction equipment and materials can be procured locally. Based on experience obtained in the Phase I Project, the construction equipment and materials will be procured locally in view of their proven suitability vis-a-vis local construction method and the easy maintenance of the new school facilities in the future. The decision on local suppliers will be made based on the supply capacity and durability and other qualitative aspects of the materials to be supplied. Several suppliers will be selected in order to ensure the stable supply and quality of products. The procurement plan for the main equipment and materials is described below.

#### (1) Structural Work

- Cement : Locally produced cement
- Reinforcing Bars : 10 mm round bars made in Viet Nam and other products made in third countries which are distributed in Viet Nam
- Bricks : Many varieties are available for both structural and face bricks within the provincial or district boundary; bricks baked at a high temperature should be used in view of better durability
- Aggregate : Available within the provincial or district boundary
- Concrete : The concrete mixing at each site should be supported by clear indication of the cement, aggregate and sand mixing ratios while the cement consumption volume should be checked to ensure a proper mix; concrete placing will use either a barrow or concrete bucket
- Forms : Wooden forms; careful attention should be paid to the building of pillars and beams, etc. to ensure high structural precision

#### (2) Finishing Work, Windows and Doors

- Floor Materials : There are many varieties of on-site, polished terrazzo masonry which suit the planned construction method very well
- Wall Tiles : Locally available products
- Mortar : Cement mortar to be arranged on site; strict quality control should be introduced by clearly indicating the mixing ratios

- **Paint** : Locally available products (imported from third countries)
- **Wooden Windows and Doors** : Local products made of CHO TRI will, in principle, be used with the quality grade to be designated together with strict control of the anti-ant treatment and proper drying; based on experience obtained in the Phase I Project, a local wood processing plant will be constructed to mass produce the products under technical guidance
- **Glass** : 3 - 5 mm thick glass produced in Viet Nam
- **Louvre Windows** : Locally available products
- **Metal Fittings** : Locally available products
- **Roofing Materials** : Locally produced clay roof tiles which will be fastened to the roof structure by steel wire

**(3) Plumbing**

- **Piping** : Locally available products
- **Valves** : Locally available products
- **Sanitary Fixtures** : Locally available products
- **Well Pumps** : Locally available products

**(4) Electrical Installations**

- **Lighting Fixtures** : Locally available products
- **Cables** : Locally available products
- **Conduits** : Locally available products (PVC conduit pipes)
- **Wiring Accessories**: Locally available products
- **Distribution Boards**: Locally available products
- **Lightning Rods** : Locally available products

**(5) Educational Equipment**

- Furniture : To be manufactured locally
- Blackboards : To be manufactured locally
- Teaching Materials : Locally available products  
(designated items by the Ministry of Education and Training)

**(6) Construction Equipment and Materials for Temporary Facilities**

The smooth implementation of the Project will require a number of temporary facilities in the subject provinces. Thua Thien-Hue Province will have temporary offices (Project Headquarters responsible for the overall control of the construction work in the 3 provinces and the Hue Working Area Management Office), wood processing plant, stock yard, equipment warehouse, reinforcing bars processing plant, form processing plant and accommodation facilities while Quang Tri Province and Quang Binh Province will both have a Working Area Management Office, stock yard, equipment warehouse, reinforcing bar processing plant, form processing plant and accommodation facilities. The equipment and materials required to construct these temporary facilities will be procured in Japan and third countries.

Table 3-2 Construction Material Procurement Sources, etc.

Item	Viet Nam		Japan	Remarks
	Local Product	Imported from Third Country		
Sand	○	○		Careful checking of the suppliers is required as the price varies from one area to another.
Gravel	○			
Cement	○			Multiple sources will be required in view of a possible supply shortage.
Form Materials	○			The 3 subject provinces produce good timber and have a high level of wood processing activities.
Bricks	○			There is a brick factory in the Project Area and the quality of locally available products is adequate. Bricks made at a high baking temperature should be selected.
Timber	○			Local timber should, in principle be used as in the case of forms.
Wooden Window Frames and Doors	○			Due to the perceived problems of delivery and quality, a temporary wood processing plant will be constructed in Thua
Blackboards	○			Thien-Hue Province to improve the technical capability of existing wood processing plants and the sub-contractors
Wooden Furniture	○			
Metal Fittings		○		
Paint		○		
Glass	○			
Roof Drains		○		
Louvre Windows		○		
Wall Tiles		○		
On-Site Terrazzo Masonry	○			
Organs		○	○	
Piping	○	○		
Meters	○	○		
Valves	○	○		
Sanitary Fixtures		○		
Well Pumps		○		
Conduit Pipes	○	○		
Cables	○	○		
Power Boards	○	○		
Lightning Rods		○		
Lighting Fixtures		○		
Ceiling Fans		○		
Power Outlets		○		
Vehicles		○		
Construction Equipment and Materials for Temporary Facilities	○	○	○	
Stationary and Telecommunication Equipment	○	○		

### **3.1.6 Implementation Schedule**

If the Project is to be implemented with grant aid provided by the Government of Japan, a design and supervision agreement will be concluded between the Vietnamese Ministry of Education and Training and the Japanese Consultant following signing of the E/N by the two countries to commence the implementation of the Project. The Project will be implemented in 3 stages, i.e. (i) detailed design and preparation of tender documents, (ii) tender and conclusion of construction agreement and (iii) construction work.

#### **(1) Detailed Design and Preparation of Tender Documents**

Based on the contents of the Basic Design Report, the Consultant will conduct the detailed design of the facilities and will prepare the tender outline for the construction work and documents for legal agreements in line with the guidelines set by the Japanese grant aid system. Thorough consultations will be held with the Ministry of Education and Training for the preparation of the detailed design documents and the tender work will only commence after approval of the detailed design results by the Ministry of Education and Training.

#### **(2) Tender and Construction Agreement**

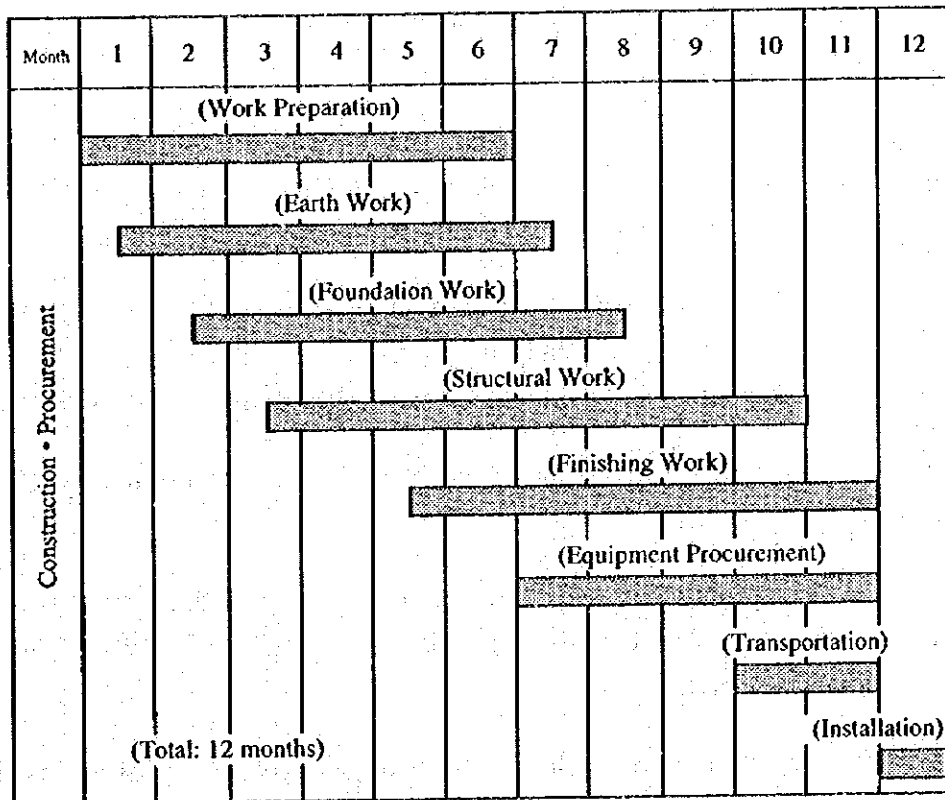
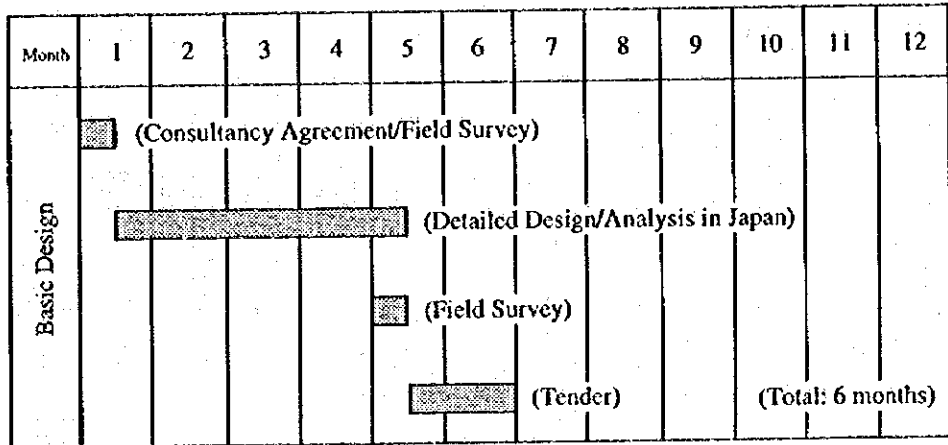
The Consultant will announce the tender for the Project in Japan on behalf of the Ministry of Education and Training, which is the Project Implementation Agency, and will conduct the pre-qualification of bidders for the construction work. The actual tender will take place in Japan, attended by officials of the Government of Viet Nam, and the pre-qualified construction companies will be invited to submit their bids. The bidder with the lowest bidding price will be declared the successful bidder provided that the contents of the bid are assessed as being adequate and will conclude the construction agreement with the Ministry of Education and Training. This agreement will become valid when certified by the Government of Japan. It is estimated that approximately 6 months will be required from the conclusion of the design and supervision agreement with the Consultant to the conclusion of the construction agreement.

#### **(3) Construction Work**

The conclusion of the construction agreement will be followed by a preparatory period of approximately one month before commencement of the foundation work. The Working Area Management Office established in each province will supervise the construction of 18 schools in Quang Binh Province, 11 schools in Quang Tri Province and 16 schools in Thua Thien-Hue Province. More than one construction group will be formed at each

office and each group will be responsible for the construction of 3 - 5 schools. It will take 12 months to complete the entire construction work at all sites. Table 3-3 shows the overall project implementation schedule.

Table 3-3 Project Implementation Schedule



### **3.1.7 Obligations of Government of Viet Nam**

The necessary measures to be taken by the Government of Viet Nam in connection with the implementation of the Project, agreed upon in the Minutes of Discussions for the Basic Design Study, are listed below.

- 1) Securing, clearance, levelling and reclamation of the sites for the Project prior to the Project's implementation.
- 2) Provision of a proper access road to each site.
- 3) Incidental outdoor work, such as gardening, fencing, exterior lighting and other incidental facilities, in and around each site, if necessary.
- 4) Bearing of the commission for the banking services of the Japanese foreign exchange bank based upon Banking Arrangement, i.e. the advise commission for "Authorisation to Pay" and payment commission.
- 5) Ensuring of the prompt unloading, tax exemption and customs clearance at the port of disembarkation in Viet Nam and prompt internal transportation of the materials and equipment provided by Japanese grant aid for the Project.
- 6) Exemption of Japanese nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Viet Nam in respect of the supply of products and services under the verified contracts.
- 7) Accordance of all facilities necessary for Japanese nationals who as services may be required in connection with the supply of products and services under the verified contracts for their entry into Viet Nam and their stay in Viet Nam to conduct their work.
- 8) Provision of all necessary permission, licences and other authorization required for implementation of the Project.
- 9) Proper budgetary appropriation and provision of teaching and administrative staff members for the proper and effective operation and maintenance of the equipment provided with Japanese grant aid.
- 10) Bearing of all expenses, other than those to be borne by Japanese grant aid within the scope of the Project.



## **3.2 Operation and Maintenance Plan**

### **(1) Operation and Maintenance System**

The operation and maintenance of the new school facilities and equipment will be conducted by the school management committee, the members of which will consist of representatives of the District People's Committee, the headmaster, deputy headmaster and representatives of the parents. To be more precise, the headmaster and other teachers will be responsible for the safe-keeping and maintenance of the equipment while pupils, parents and local inhabitants will be responsible for the regular cleaning of the facilities. The septic tank should be thoroughly cleaned approximately twice a year to maintain the proper function of the toilets. In regard to other facilities, no maintenance or repair cost should be incurred for approximately 5 years after completion provided that they are used in a proper manner, except for the replacement of electric bulbs. When considering the long-term maintenance cost, it will be eventually necessary to replace or repair the wooden window frames, doors, metal fittings, water supply fittings and water pump, etc. All of these items will be locally available and their replacement or repair requirements can be adequately dealt with by local engineers.

### **(2) Operation and Maintenance Cost**

#### **1) Personnel Cost**

The Project aims at replacing deteriorated classrooms and adding new classrooms based on the present number of classes and does not anticipate an expansion of the school size. Consequently, no new teachers will be required and the personnel cost should be managed within the current budget.

#### **2) Electricity Cost**

The electrical installations planned under the Project consist of lighting and ceiling fans for the classrooms and staff room and a water pump for water supply purposes. As the total power load capacity will vary from one school to another due to different school sizes, the power cost estimation is based on the smallest and largest schools. The smallest school (8 classrooms) will have a power load capacity of 7.5 KVA while the largest school (18 classrooms) will have a power load capacity of 15.5 KVA.

In regard to lighting, it is assumed that natural lighting will meet the lighting requirements for daytime schooling and the daily lighting use is assumed to be 2 hours in the evening. It is assumed that the ceiling fans will be used for 6 hours a day

in the summer period of 6 months. The operating hours of the water pump are assumed to be 2 hours a day for the smallest school (daily consumption of 3 m<sup>3</sup>) and 4 hours a day for the largest school (daily consumption of 6 m<sup>3</sup>) based on a water consumption rate of 5 - 8 litres/pupil/day.

• Unit Charge

① Lighting

Smallest School :  $3.2 \text{ KW} \times 2 \text{ hours/day} \times 22 \text{ days/month} \times 580 \text{ VN Dong} \times 12 = 979,768 \text{ VN Dong/year} \dots\dots\dots(a1)$

Largest School :  $6.7 \text{ KW} \times 2 \text{ hours/day} \times 22 \text{ days/month} \times 580 \text{ VN Dong} \times 12 = 2,051,808 \text{ VN Dong/year} \dots\dots\dots(a2)$

② Ceiling Fans

Smallest School :  $4.0 \text{ KW} \times 6 \text{ hours/day} \times 22 \text{ days/month} \times 580 \text{ VN Dong} \times 6 = 1,837,440 \text{ VN Dong/year} \dots\dots\dots(b1)$

Largest School :  $8.4 \text{ KW} \times 6 \text{ hours/day} \times 22 \text{ days/month} \times 580 \text{ VN Dong} \times 6 = 3,858,624 \text{ VN Dong/year} \dots\dots\dots(b2)$

③ Water Pump

Smallest School :  $0.15 \text{ KW} \times 2 \text{ hours/day} \times 22 \text{ days/month} \times 580 \text{ VN Dong} \times 12 = 45,936 \text{ VN Dong/year} \dots\dots\dots(c1)$

Largest School :  $0.15 \text{ KW} \times 4 \text{ hours/day} \times 22 \text{ days/month} \times 580 \text{ VN Dong} \times 12 = 91,372 \text{ VN Dong/year} \dots\dots\dots(c2)$

• Annual Electricity Bill

Smallest School :  $a1 + b1 + c1 = 2,900,000 \text{ VN Dong}$

Largest School :  $a2 + b2 + c2 = 6,000,000 \text{ VN Dong}$

### 3) Maintenance Cost

(Unit: 1,000 VN Dong)

Item	Frequency	Annual Cost
a. Replacement of Fluorescent Lamps	annually	508
b. Cleaning of Septic Tank	twice/year	assistance of local inhabitants
c. Painting of Doors and Window Frames	every 5 years	2,754
d. Replacement of Damaged Window Glass	every 10 years	1,770
e. Replacement of Water Pump	every 10 years	220
Total		5,252

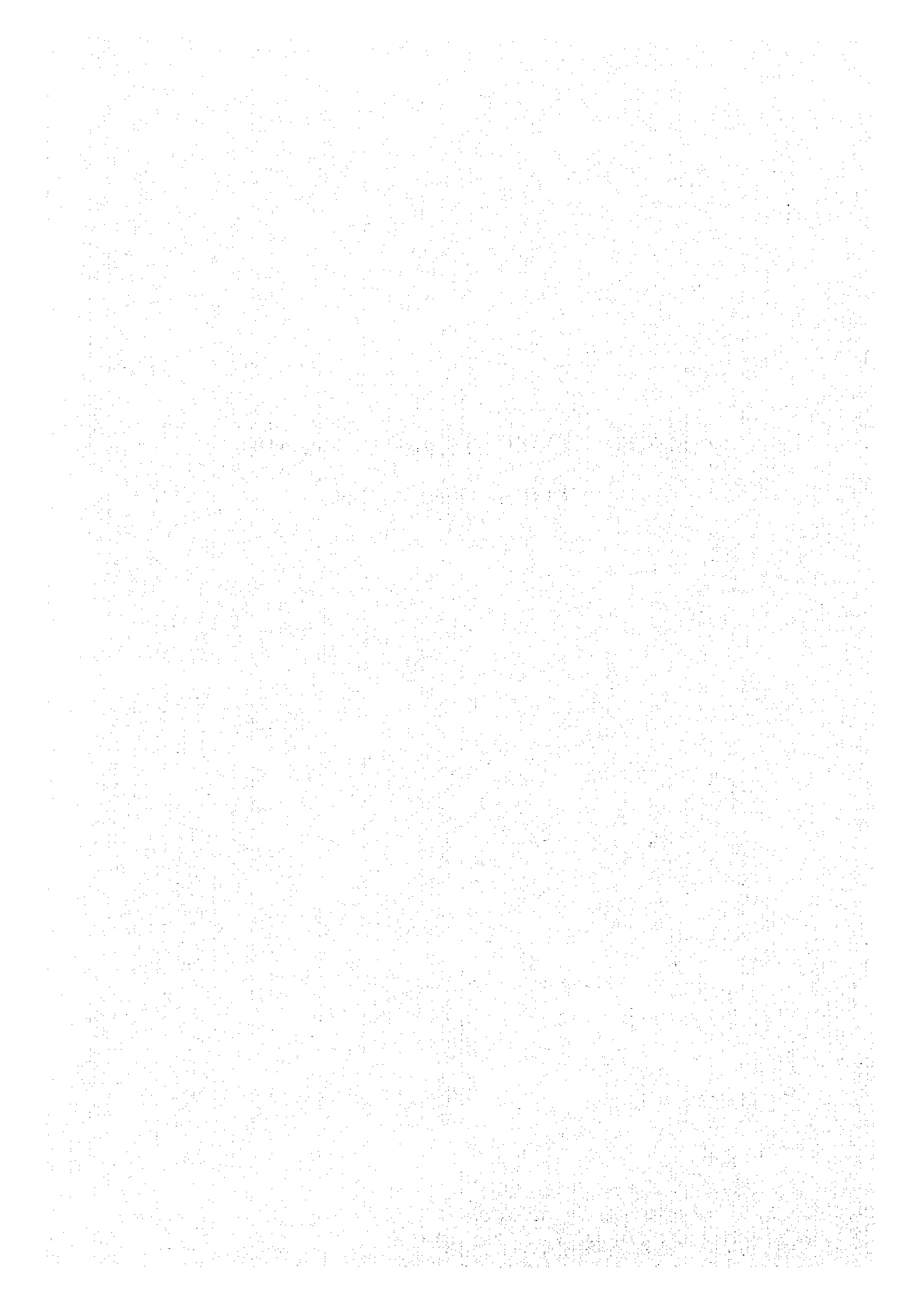
### 4) Operation and Maintenance Budget

As of fiscal 1995, the subject schools have an average annual operation and maintenance budget (covering the water, lighting and maintenance costs) of 23,173,000 VN Dong. The operation and maintenance budget allocated by the District People's Committee per school for the same year is 11,000,000 - 15,000,000 VN Dong with local inhabitants supplementing the shortage of 11,538,000 VN Dong.

The operation and maintenance cost of the new schools will not only be sufficiently met by the current budget level but will also actually reduce the burden on local inhabitants by meeting the budgetary appropriation shortage.



## **CHAPTER 4 PROJECT EVALUATION AND RECOMMENDATIONS**



## **CHAPTER 4 PROJECT EVALUATION AND RECOMMENDATIONS**

### **4.1 Suitability and Positive Effects of the Project**

Since the introduction of the Doi Moi policy, Vietnam's economy has been recording steady growth and the socioeconomic development policy adopted by the Government of Viet Nam designates the development of human resources as a key priority issue to support economic development. Vietnam's education budget for fiscal 1995 accounts for 11% of the total government budget and 2.77% of the GDP which is approaching the Asian average of 3%. Meanwhile, the GDP per capita is as low as some 220 US\$ which puts Viet Nam in the category of a LLDC and the state of the government finance is by no means affluent. In fact, most of the education budget is used for teachers' wages which are generally inadequate to support a stable social life. As a result, the teaching profession has lost its attractiveness to the point that the qualitative decline of teachers has become a national issue.

Under these circumstances, the scope of the distribution of the education budget to physical facilities and school equipment is extremely limited. Many of the existing primary school buildings were constructed around 1975 and the almost total lack of maintenance since then has resulted in an advanced state of natural deterioration which has been exacerbated by frequent damage due to typhoons and floods. To make matters worse, the classroom shortage has reached a critical stage due to the steadily increasing number of pupils. The number of primary school enrolments has increased from 8.25 million in 1985 to 10 million in 1995, an increase of 21.7% in the last 10 years, and is expected to further increase to 10.9 million in 2001. The shortage of classrooms is currently dealt with by means of the temporary use of local People's Committee facilities and makeshift classrooms but still makes double or even triple shift schooling necessary throughout the country. The 3 subject coastal provinces (Quang Binh, Quang Tri and Thua Thien-Hue) of the Project in central Viet Nam are particularly prone to typhoon and flood damage and the emergency repair cost of the damaged school buildings has become a severe financial burden on local inhabitants, making the urgent reconstruction of the ageing buildings together with new facilities necessary to ease the classroom shortage. The new buildings should be strong enough to avoid damage due to typhoons and/or floods in order to reduce the current maintenance cost level.

The development of primary school facilities under the Project will definitely contribute to achieving the key target of "Education for All by the Year 2000" adopted by Vietnam's educational development programme and also to Vietnam's general socioeconomic development through the development of human resources. Some 35,000 pupils will benefit from the Project, bringing the total number of pupils benefiting from the new, improved

educational environment created by the three phases so far to 82,000. Moreover, their parents and local inhabitants will also benefit from the lower maintenance cost of the new facilities as they have so far had to bear part of the cost. Adequate school operation and maintenance can be achieved with the current budget level as the maintenance cost of the new facilities will actually decline. The implementation of the Project will also ease the classroom shortage and will provide educational opportunities for more children, thereby contributing to the improvement of local education. Given the wide ranging benefits and positive effects described above, the implementation of the Project as a grant aid project of the Government of Japan is judged highly appropriate.

The construction of new school facilities and provision of equipment for 45 primary schools in Quang Binh, Quang Tri and Thua Thien-Hue Provinces under the Project are expected to achieve the following positive effects.

#### (1) Improvement of Educational Environment

##### 1) Eradication of Deteriorated or Dangerous Classrooms

All 45 subject schools of the Project are suffering from an advanced state of deterioration and the roofs and walls are in danger of collapse if hit again by a typhoon. Most of the current facilities are of a temporary nature as a result of repeated damage due to typhoons and/or flooding and emergency repair in the past. The 45 schools use 563 classrooms, Excluding borrowed or joint-use classrooms, only 80 classrooms (14.2% of the total) are capable of being used for another 10 years. The rebuilding of the 434 classrooms which are highly deteriorated and in a dangerous condition under the Project will greatly improve the physical safety of the school and the educational environment in general.

##### 2) Alleviation of Classroom Shortage

The 45 schools currently have 563 classrooms and teach 987 classes. However, only 330 classrooms (59%) belong to the primary schools themselves and 107 classrooms (19%) are shared by or borrowed from secondary schools. The remaining 126 classrooms (22%) are borrowed from elsewhere. The class-classroom ratio currently stands at 1.75 or 2.99 excluding the borrowed or joint-use classrooms. In order to ease the classroom shortage, these schools have been opening up branch schools using borrowed facilities but still find it necessary to employ double shift or triple shift teaching. The Project plans to add 125 classrooms to these schools. Together with the 434 classrooms to be rebuilt, 514 new classrooms will be made available upon completion of the Project. With the 129 existing classrooms which will not be



affected by the Project, the number of classrooms will total 643, reducing the class-classroom ratio to 1.52 (1.42 if multi-purpose classrooms are included). The lowered ratio will mean the eradication of triple shift schooling and the increased intake capacity will make primary education accessible to many more children. Given the new capacity, triple shift schooling at these primary schools should not be necessary for at least 5 years after the Project's completion even if the number of eligible local children increases as estimated.

### 3) Improvement of School Management

Most of the subject schools currently lack a staff room even if they have a headmaster's office. The existing staff room at some schools is deteriorated and too small to accommodate all teachers, resulting in unnecessary school management difficulties. The presence of many branch schools which should, in principle, be integrated to the main school also hinders efficient school management. As the Project intends the integration of as many branch schools as possible to their main schools together with the introduction of a proper staff room and meeting room, it should greatly contribute to the improvement of school management.

### (2) Improvement of Educational Efficiency

In addition to improving the educational environment at those schools described in (1) above, the provision of new educational equipment under the Project will improve the teaching level, which in turn will improve the level of learning. As a result, the repeat ratio will decline. Most cases of dropping-out at these schools can be attributed to financial problems on the part of the pupils' parents. A reduction of the contribution of parents to the repair of school facilities as a result of the Project's implementation should ease the financial burden on parents. The expected decline of the dropping-out rate due to the improved financial position of parents will mean an improvement of the overall school enrolment rate.

### (3) Improvement of Hygiene Conditions and Hygiene Education

At present, the subject schools lack toilet facilities or only have inadequate facilities. The school environment is, therefore, rather unhygienic, causing concern in regard to an outbreak of harmful insects which carry infectious diseases or waterborne diseases originating from contaminated groundwater. Under the Project, all the subject schools will receive new toilet facilities equipped with water supply and drainage facilities and, therefore, the standard of hygiene should be greatly improved. With the provision of actual toilet facilities, the pupils will be able to learn about their use and will acquire a

proper understanding of the importance of hygiene through practical education and training.

(4) Contribution to Local Inhabitants

Many of the school buildings and houses in the Project Area suffer heavy damage due to strong typhoons every year. The structural design for the new school buildings to be constructed under the Project takes typhoons into consideration and the floor height is set at a level which avoids submersion at the time of flooding. Consequently, these buildings can act as evacuation shelters in the case of a natural disaster. Moreover, the new school buildings can be used as local public facilities during normal times to service various types of social education, including literacy education. The strength of the new buildings will mean a reduction or elimination of the contribution conventionally made by local inhabitants to the school facility repair cost when ever they are damaged by a typhoon.

(5) Contribution to Improved Educational Environment for Secondary Education

Of the 45 subject schools, 14 schools borrow or share classrooms (total of 107 classrooms) with secondary schools. As the process of separating primary schools from secondary schools is currently in progress following the decision to make primary education compulsory, these 14 schools will eventually be split into primary and secondary schools. These schools currently adopt dual shift schooling, i.e. generally secondary education in the morning and primary education in the afternoon. With the implementation of the Project, the secondary schools in question will have more classrooms and will be able to provide improved full-time secondary education.

(6) Transfer of Construction Technologies and Effect as Model Schools

The Project is designed to assist the Primary School Facilities Development Plan promoted by the Ministry of Education and Training. All the new facilities will be built using local construction methods and locally available equipment and materials. The Project aims at securing the minimum primary school functions and building safety technical level to avoid damage to the buildings due to natural disasters. In this context, the new school buildings are expected to act as the model for similar projects which the Ministry of Education and Training may implement in other provinces. Furthermore, the construction work supervised by the Contractor, as well as by the Consultant, is expected to contribute to the rationalisation of local construction methods and also to the transfer of construction management techniques.

## 4.2 Recommendations

As described in 4.1, the Project is expected to have important positive effects. In view of its perceived contribution to the improvement of primary education for all, the provision of Japanese grant aid for the Project is judged to be appropriate. In addition, the Vietnamese side appears to have sufficient manpower and funding to manage the implementation of the Project as well as the post-project management of the new facilities constructed under the Project. Nevertheless, improvement of the following points will further ensure the smooth and effective implementation of the Project.

### (1) Completion of Work to be Undertaken by Vietnamese Side

For the implementation of the Project, it is essential that the Vietnamese side complete the work for which it is responsible in a proper manner. In particular, the site preparation should be completed prior to the commencement of the actual building construction work led by the Japanese Contractor as in the case of the Phase I and Phase II Projects. Although the District People's Committees which control the subject schools and the Provincial People's Committees are directly responsible for site preparation, the Project Management Committee of the Ministry of Education and Training, which is the Project Implementation Agency, must supervise the People's Committees to ensure the completion of the work in question.

### (2) Recruitment of New Teachers and Improvement of Living Environment

The number of teachers at the subject schools exceeds the number of classes in Quang Binh and Quang Tri Provinces while there are 22 vacancies at 7 schools in Thua Thien-Hue Province. While all the schools manage to provide a teacher for each class by mobilising the headmaster and/or deputy headmaster, the recruitment of new teachers is necessary to fill the vacancies. The geographical distribution of these vacancies shows a clear regional gap in that a teacher shortage is commonly associated with schools in mountainous or coastal remote areas due to the shortage of teachers with local connections and the general reluctance of teachers to work at schools in remote areas. The main reason for this reluctance is the low salary, lack of opportunity to make a side income and poor living environment, including low quality staff accommodation. Although the existing teachers at the visited schools are very committed to their work, their enthusiasm alone is not a fundamental solution to the general unpopularity of teaching positions at remote schools and more concrete measures to improve the wage and living environment are required. While it is the responsibility of the central government to fund improved teacher wages, both the Provincial and District People's Committees should improve the living environment for teachers, including teacher

accommodation, with the assistance of local inhabitants. It may be desirable to allocate some of the savings made from the repair cost of the existing school facilities which is partially paid by local inhabitants to funding improvement of the living environment for teachers.

### (3) Improvement of Branch Schools in Remote Areas

The scope of the Project includes the rebuilding of existing school facilities and the construction of new classrooms at both main and branch schools although branch schools located near main schools to compensate for the classroom shortage of the latter and upper grade classes of branch schools located at a distance of 2.5 - 4 km from main schools will be integrated to the respective main schools. Those branch schools located further than 4 km from their main schools will not be integrated under the Project regardless of the present conditions of the facilities. The reality is that the present condition of the facilities at these branch schools is far worse than that of the main schools. The 129 existing classrooms which are not affected by the Project to ensure their continuous use include 49 classrooms of branch schools which are judged to require urgent rebuilding due to their dire state. As the continuous existence of these branch schools is essential from the viewpoint of appropriate school distribution, however, the rebuilding or repair of these 49 classrooms and their proper maintenance thereafter by local inhabitants is highly desirable.