


No. 17

THE DEPARTMENT OF EDUCATION, CULTURE AND SPORTS
THE REPUBLIC OF THE PHILIPPINES

BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR
THE IMPROVEMENT OF EDUCATIONAL FACILITIES (PHASE III)
IN
THE REPUBLIC OF THE PHILIPPINES

SEPTEMBER 1995

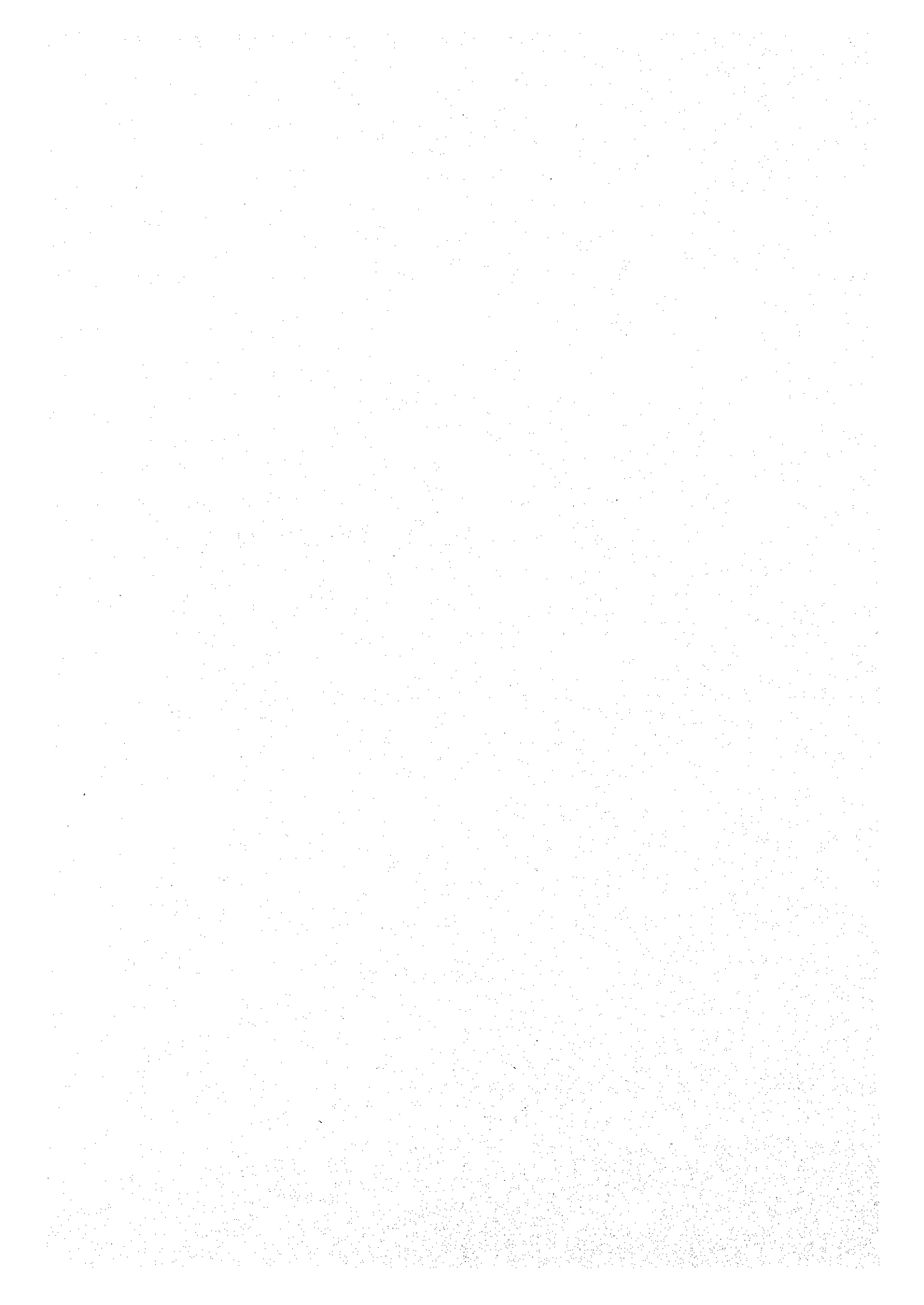
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JAPAN INTERNATIONAL COOPERATION AGENCY
KOHJI, ARCHITECT & ASSOCIATES, INC.

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BASIC DESIGN STUDY REPORT ON THE PROJECT FOR THE IMPROVEMENT OF THE EDUCATIONAL FACILITIES (PHASE III) IN THE REPUBLIC OF THE PHILIPPINES

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**JAPAN INTERNATIONAL COOPERATION AGENCY
MOHRI, ARCHITECT & ASSOCIATES, INC.**

PREFACE

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

JICA sent to the Philippines a study team from March 10 to April 10, 1995.

The team held discussions with the officials concerned of the Government of the Philippines 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 the Philippines 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 Republic of the Philippines for their close cooperation extended to the study team.

September, 1995



Kimio Fujita
President

Japan International Cooperation Agency

September, 1995

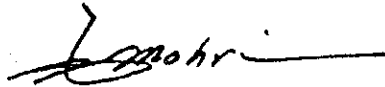
Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for the Improvement of Educational Facilities (Phase III) in the Republic of the Philippines.

This study was conducted by Mohri, Architect & Associates, Inc., under a contract to JICA and during the period from February 22, 1995 to September 24, 1995. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of the Philippines and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

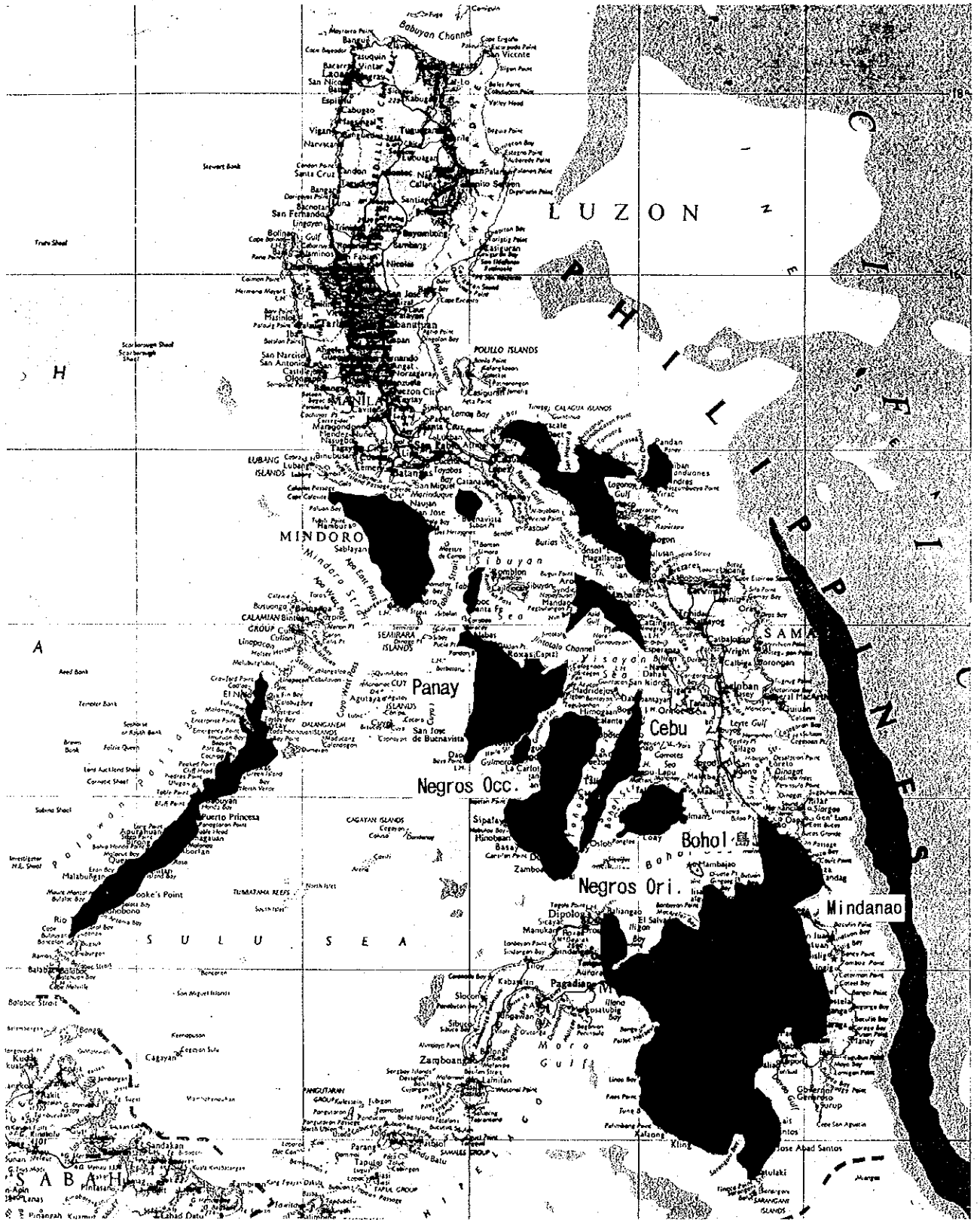
Finally, we hope that this report will contribute to further promotion of the Project.

Very truly yours,



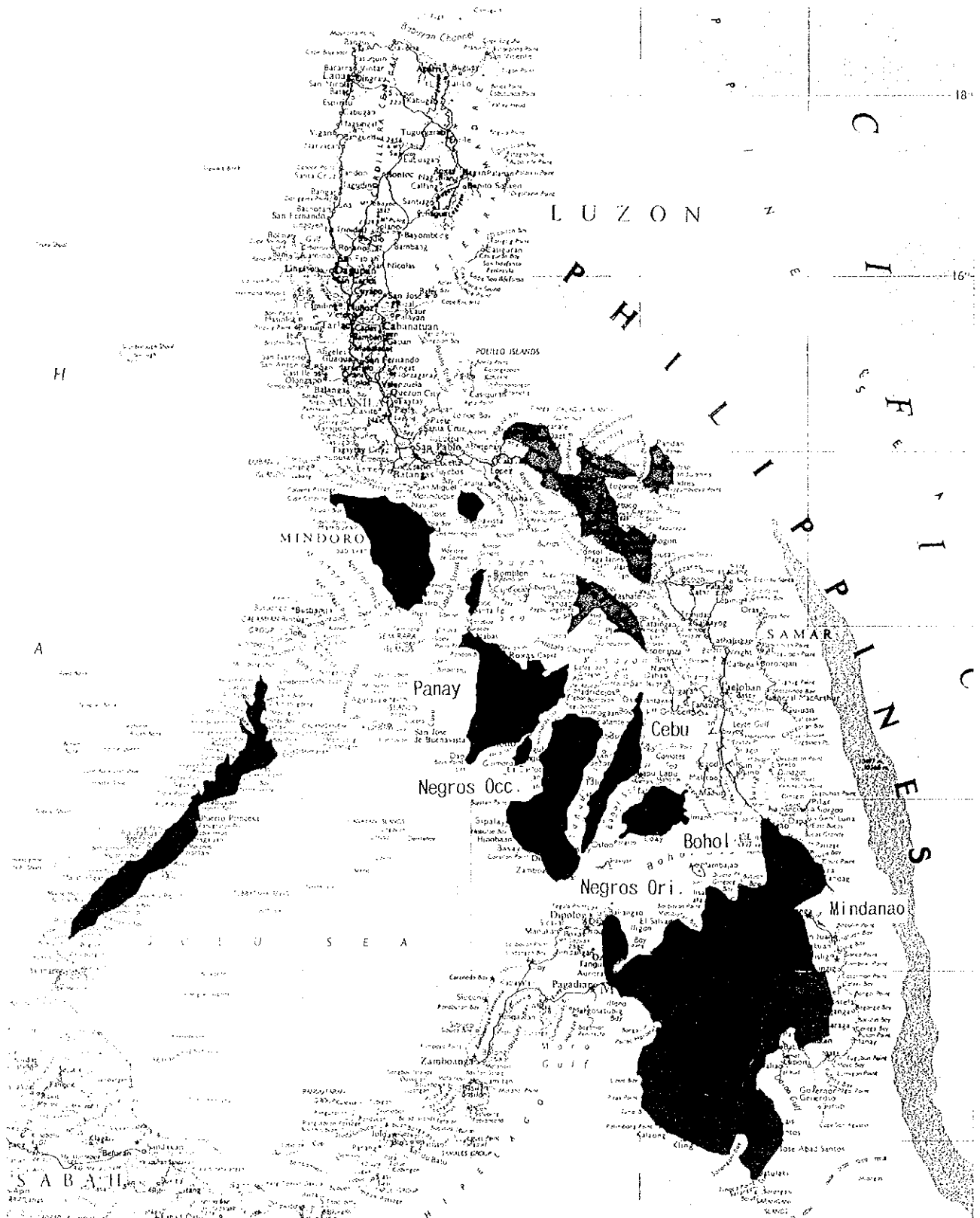
Takenobu Mohri
Project manager
Basic design study team on
the Project for the Improvement of
the Educational Facilities (Phase III)
Mohri, Architect & Associates, Inc.

MAP OF THE PHILIPPINES



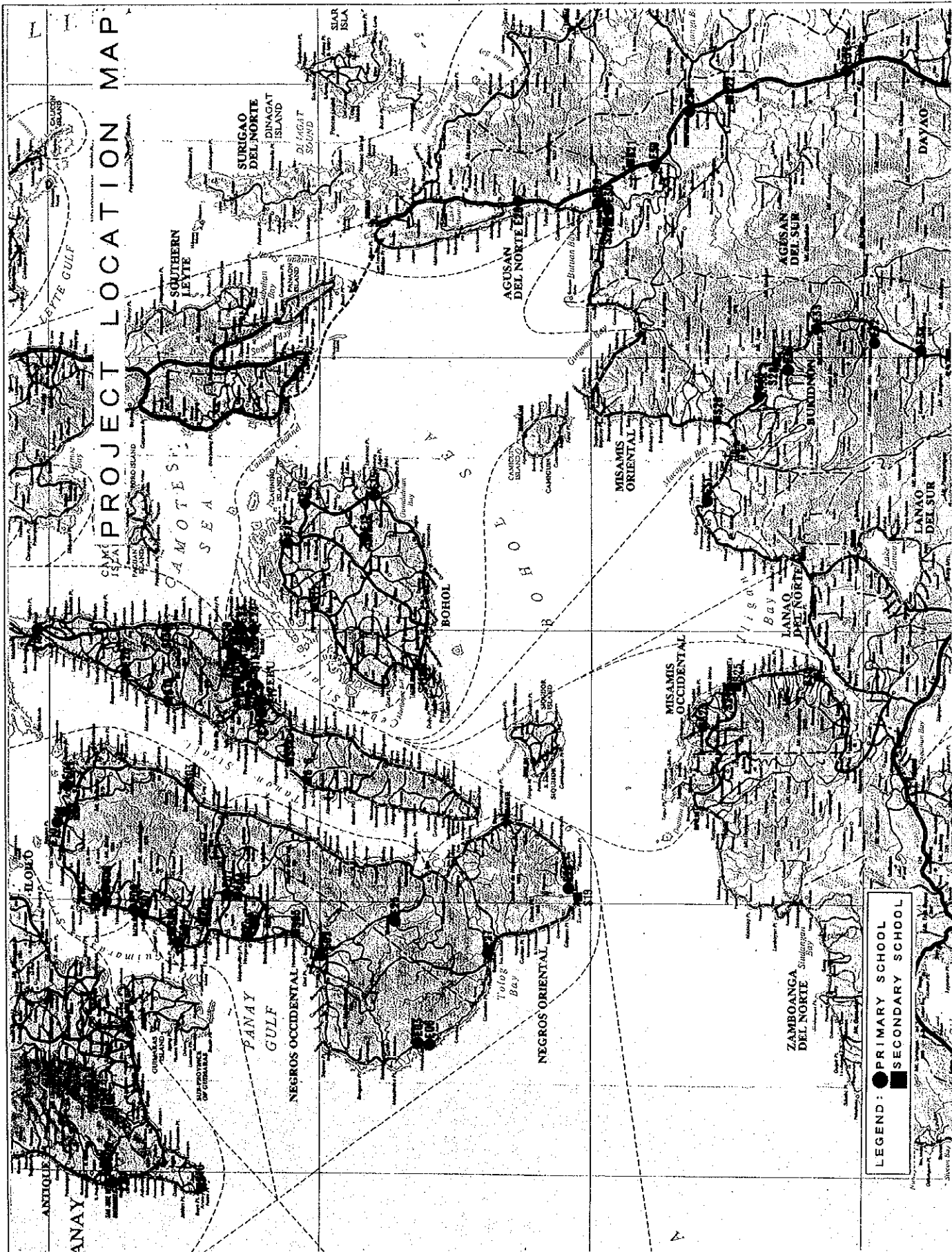
- EFIP I : REGION 4 (Southern Tagalog) :** Mindoro, Palawan, Marinduque, Tablas
- EFIP II :** Region 5 (Bicol) : Luzon , Masbate, Catanduanes
 Region 11 (Southern Mindanao) : Mindanao
 Region 12 (Central Mindanao) : Mindanao
 A.R.M.M. : Mindanao
- EFIP III :** Region 6 (Western Visayas) : Panay, Negros Occ.
 Region 7 (Central Visayas) : Cebu, Bohol, Negros Ori.
 Region 10 (Northern Mindanao) : Mindanao

MAP OF THE PHILIPPINES



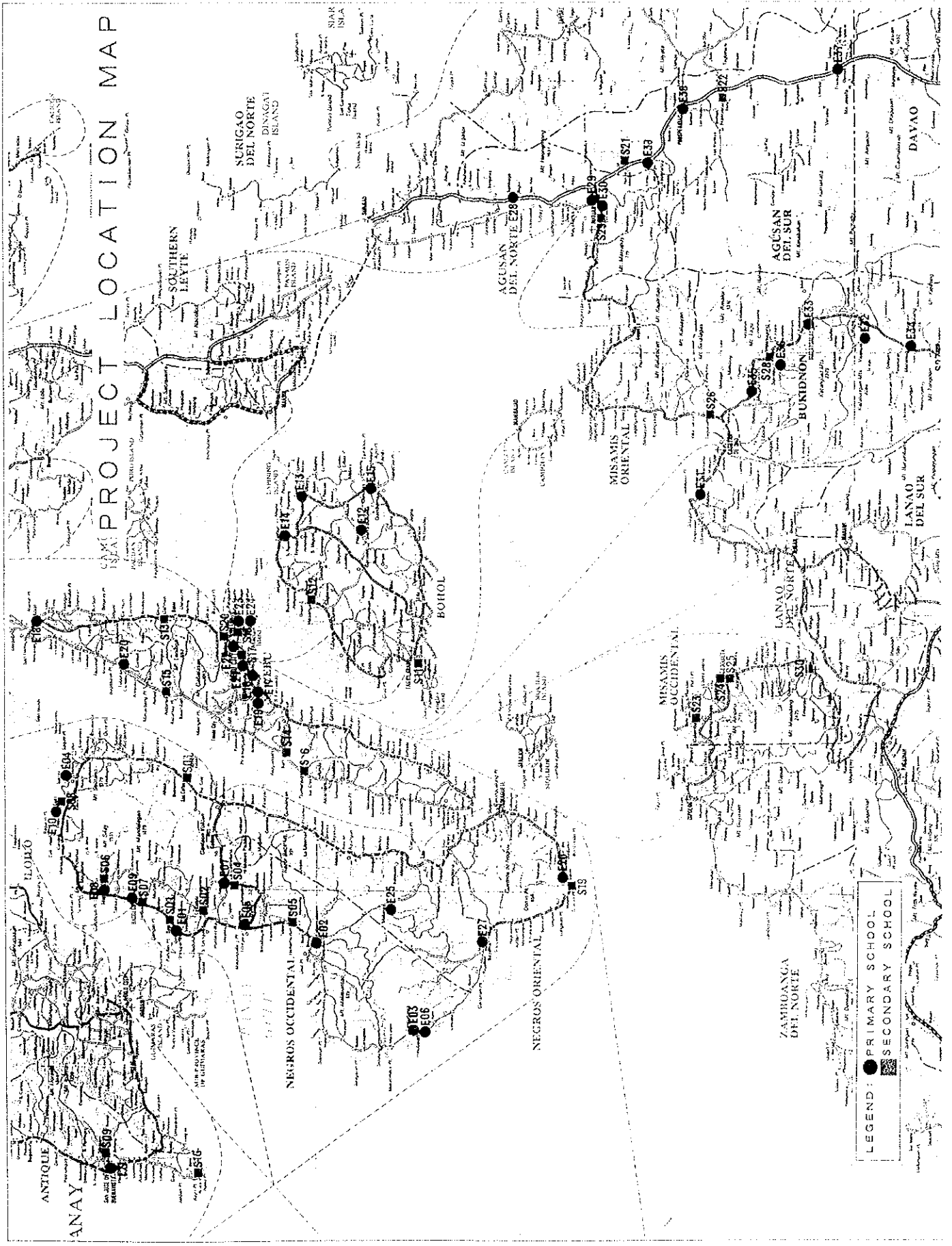
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PROJECT LOCATION MAP



LEGEND: ● PRIMARY SCHOOL
■ SECONDARY SCHOOL

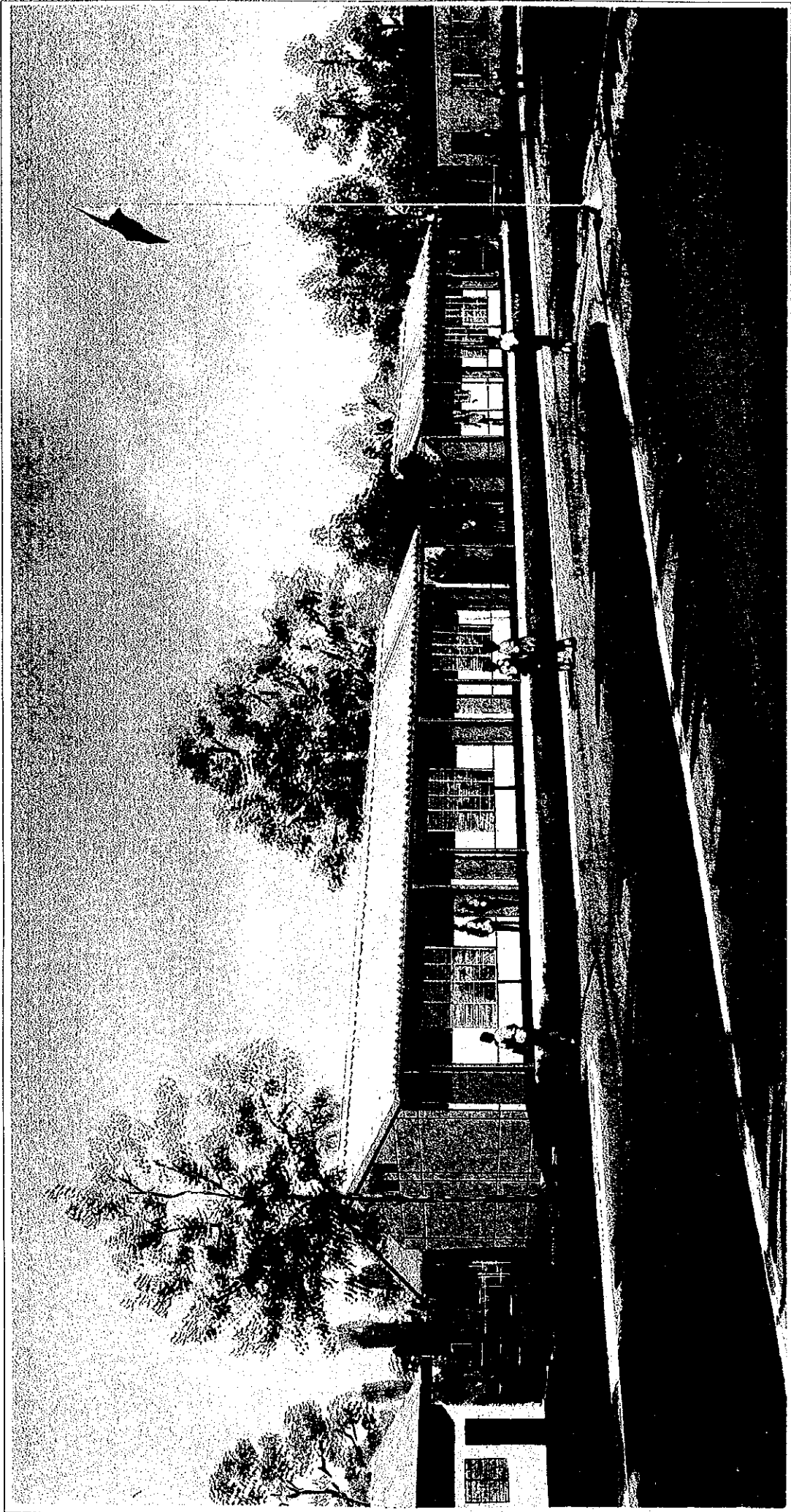
PROJECT LOCATION MAP



LEGEND: ● PRIMARY SCHOOL
■ SECONDARY SCHOOL

PROJECT LOCATION MAP





PERSPECTIVE

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Letter of Transmittal

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CHAPTER 1. BACKGROUND OF THE PROJECT

CHAPTER 1 Background of THE PROJECT

The Republic of the Philippines formulated a Five Year Educational Development Plan in 1983, with the aim of increasing educational opportunities to more children. It did so by increasing school facilities or issuing grants. As a result, the total number of students attending the public elementary and secondary schools in the entire land of the Philippines increased from 11.62 million in fiscal year 1982 to 15.1 million in fiscal year 1992.

As part of the development plan, the Japanese government implemented the "School Building Construction Plan" (Phases 1 to 5) in order to urgently repair the elementary and secondary schools damaged by typhoons. This was done with grant aid cooperation from the fiscal years 1988 to 1993. The Japanese government wanted to implement the project as quickly as possible, hence the use of the prefabricated construction method which reduces overall construction time. As a result, 1,384 general classrooms, 219 science laboratories, and 360 toilets were added to 360 elementary and secondary schools, which gave educational opportunities to at least 86,000 students and significantly contributed to the enlargement of basic education in the Philippines.

The government of the Philippines made a Medium-Term National Development Plan (1993 to 1998) with the objective of training human resources. However due to natural disasters such as typhoons, combined with a 3% annual increase in the number of eligible school children, there is a chronic lack of elementary and secondary school facilities. In 1995, construction of about 42,719 classrooms, including 26,246 classrooms for elementary schools and 16,473 classrooms for secondary schools, is necessary. Natural disasters such as strong typhoons, large earthquakes, and volcanic eruptions, combined with uncertain social situations such as the attempted coup d'etat or the Gulf War in the Middle East, the economic situation of the Philippines is limited. Thus promoting the construction of school facilities with the budget of the government of the Philippines is quite difficult. Nevertheless, it remains an urgent issue. For these reasons, the government of the Philippines devised the project for the improvement of the educational facilities with the construction of about 630 school buildings using the conventional construction method at the site within six years. In addition to Phase I of the plan for Southern Tagalog, which was completed in September

1994 and the Phase II for 117 schools in Region V, XI, XII and ARMM which will be completed in October 1995, Region VI, VII and X were selected for Phase III of the plan. The Japanese government's role, as requested by the Philippine government, is in providing grant aid for the construction of these school buildings.

The purpose of this request was to prepare the school facilities for the elementary and the secondary schools in the above regions in order to solve the situation of a chronic lack of classrooms in region VI, VII and X. In this project, school buildings in the premises of existing schools will be constructed on site using the conventional construction method. 120 schools are listed as candidates.

The project is to be implemented by the Department of Education, Culture, and Sports (DECS). The contents of the request include the school facilities for elementary and secondary schools, basic educational equipment such as desks, chairs, blackboards, and shelves, and science educational instruments for the secondary schools. The contents of the request are listed below.

	Elementary School	Secondary School
School building	3 Classrooms + Toilet	3 Classrooms + Science Laboratory/ Toilet or 3 Classrooms + Toilet
Equipment	Sets of basic needed educational equipment in school facilities.	

CHAPTER 2. CONTENTS OF THE PROJECT



CHAPTER 2 CONTENTS OF THE PROJECT

2-1 Objectives of the Project

The government of the Philippines has emphasized the development of human resources and has been striving to improve the quality of education as well as upgrading and adding educational facilities. The government of Japan has already implemented the grant aid cooperation in the Philippines to construct typhoon-resistant prefabricated school buildings for 360 schools in the areas, particularly those attacked by typhoons, under the five year plan and completed the project in 1994. Due to financial restrictions of the Philippine government, frequent natural disasters, and the increase of the number of eligible school children by 3% a year, many educational facilities are still lacking. The Government of the Philippines stipulated the purpose of this plan and requested the Government of Japan to provide the grant aid. In this plan, which is to construct school buildings in about 630 existing elementary and secondary schools in six years using the conventional on-site construction method, the objective of Phase III of the project is to improve the insufficient educational facilities in Region VI, VII and X by constructing school buildings at about sixty-nine schools.

2-2 Basic Concept of the Project

2-2-1 Selection of Schools

The Department of Education, Culture and Sports (DECS) requested 110 schools to be included in the project. However the conditions of educational activities, the site situations, or the conditions of infrastructure of these schools are diverse. Thus, individual site studies were carried out by three study teams from March 4 to March 25, 1995. Table 2-1 lists the results of the site study.

(1) Selection criteria of schools to be included in the project

Because there were possibilities that some of the schools the Government of the Philippines requested to be included in this project were not appropriate, discussions were held with DECS to establish a selection criteria of schools. They are as follows.

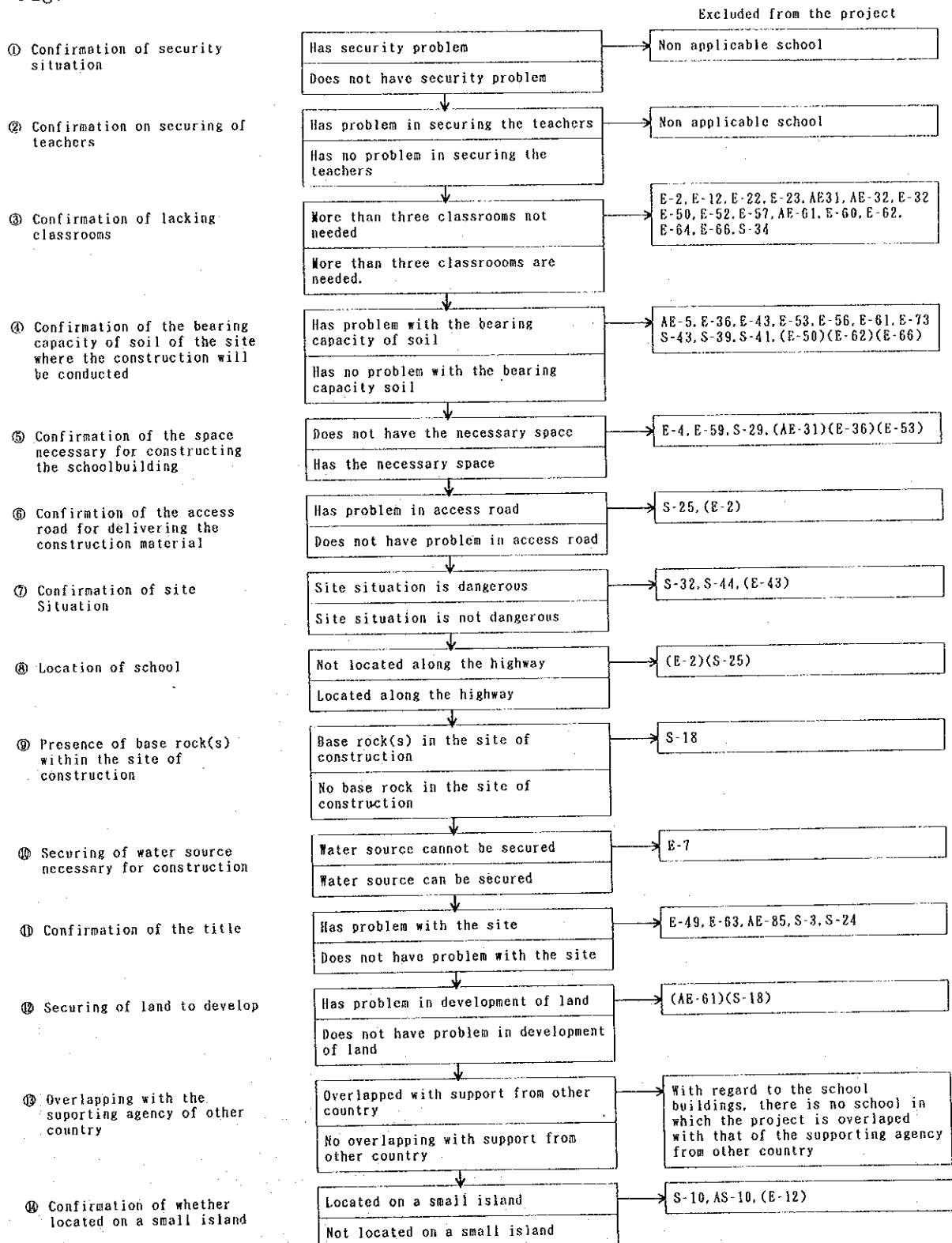
- 1) Schools that have no security problem
- 2) Schools that can secure the teachers necessary for the classrooms to be constructed by this project
- 3) Schools lacking more than three classrooms
- 4) Schools having no problem with regard to the bearing capacity of soil of the site
- 5) Schools in which the space necessary for constructing the school building(s) by this project can be secured without using the playground
- 6) Schools in which the access road necessary for the delivery of construction equipment has been secured
- 7) Schools whose site situations are not dangerous
- 8) Schools that are located along the highway
- 9) Schools having no problem with the leveling of ground at the site
- 10) Schools that can secure the water source necessary for the construction work
- 11) Schools that have the site ownership or related documents
- 12) Schools having no problem in the development of site
- 13) Schools having no plan to receive support from another foreign assisted school building project (excluding the ones that have already completed construction and in use by the students)
- 14) Schools not located on a small island

(2) Site study

(2)-1 Results of the site study

Among the 120 candidate schools requested by DECS, site studies were conducted according to the above mentioned selection criteria at 110 schools. Figure 2-1 shows the evaluation process of the schools. As a result, 41 schools were determined not to be included in the project and are listed in table 2-2. Table 2-3 lists the remaining 69 schools selected for the project, and Table 2-4 shows the schools included in the project according to the areas

Figure 2-1 Evaluation process of the schools included in the project



To analyze and evaluate as the schools to be included in the project			
School Number	Elementary School	Region VI	E-1, E-3, E-5, E-6, E-8, AE-2, AE-3, E-9, E-10, E-11, E-21
		Region VII	AE-33, E-31, E-33, E-35, E-37, E-38, E-39, AE-34, AE-35, E-41, E-42, E-44, E-45, E-46, E-47, E-48
		Region X	AE-51, E-54, E-55, E-65, E-67, E-68, E-69, AE-75, E-70, E-71, E-72, E-74
	Secondary School	Region VI	S-1, S-2, S-4, S-5, S-6, S-7, S-8, S-9, S-14, AS-23
Region VII		S-19, AS-32, S-21, AS-34, AS-35, AS-36, S-22, S-23, AS-39, S-30	
Region X		AS-81, S-46, S-40, AS-63, AS-67, S-42, S-45, AS-79, S-33, S-38	

Table 2-2 Project Schools to be excluded from the Project

Elementary Schools Region VI				
	SCHOOL No.	SCHOOL NAMES	PROBLEM	Section Criteria No.
1	E - 2	CUDCUD ELEM. SCHOOL	-No classroom shortage exists. Access road to the site problematic during rainy seasons	3, 6, 8
2	E - 4	R. MAGSAYSAY ELEM. SCHOOL	-Not enough space for constructing a new building.	5
3	E - 7	D. J. RODRIGUEZ ELEM. SCHOOL	-It would be difficult to secure construction-use water.	10
4	AE - 5	RITA LOVINO ELEM. SCHOOL	-Proposed building site is swamp land next to a rice paddy.	4
5	E - 12	DOLORES ELEM. SCHOOL	-No classroom shortage exists.	3, 14
6	E - 22	BELISON CENTRAL SCHOOL	-No classroom shortage exists.	3
7	E - 23	BULWANGAN ELEM. SCHOOL	-No classroom shortage exists.	3
Region VII				
	SCHOOL No.	SCHOOL NAMES	PROBLEM	Section Criteria No.
8	AE - 31	COGON ELEM. SCHOOL	-No classroom shortage exists. Not enough space for constructing a new building.	3, 5
9	AE - 32	UBAY CENTRAL SCHOOL	-No classroom shortage exists. Not enough space for constructing a new building.	3
10	E - 32	CARMEN CENTRAL SCHOOL	-No classroom shortage exists. Not enough space for constructing a new building.	3
11	E - 36	TABUNOC CENTRAL SCHOOL	-Bearing ground is weak and extensive land reclamation work would be necessary. Proposed building site is playground. No other land is available.	4, 5
12	E - 43	CALINDAGAN ELEM. SCHOOL	-Building site is reclaimed land on beach and it would be dangerous to build a classroom building.	4, 7
13	E - 49	STA. CATALINA CENTRAL SCHOOL	-No land ownership or legitimate land lease certificate.	11
14	E - 50	TOLEDO SOUTH CITY CENTRAL SCHOOL	-Only two classrooms are lacking. Bearing ground is weak. No other land is available.	3, 4
Region X				
	SCHOOL No.	SCHOOL NAMES	PROBLEM	Section Criteria No.
15	E - 52	BUENAVISTA EAST CENTRAL SCHOOL	-No classroom shortage exists.	3
16	E - 53	CABADBARAN NORTH CENTRAL SCHOOL	-Bearing ground is weak.	4, 5
17	E - 56	SAN MATEO ELEMENTARY SCHOOL	-Bearing ground is weak.	4
18	E - 57	M. ESPINA MEM'L. ELEM. SCHOOL	-No classroom shortage exists.	3
19	AE - 61	QUEZON ELEM. SCHOOL	-Only two classrooms are lacking. Extensive land reclamation work would be necessary.	3, 12
20	E - 59	BAYBAY ELEM. SCHOOL	-Proposed building site is playground. No other land is available.	5
21	E - 60	SAN JUAN ELEM. SCHOOL	-Only two classrooms are lacking.	3
22	E - 61	TABOC ELEM. SCHOOL ANNEX	-Building site is swamp land and extensive land reclamation work would be necessary.	4
23	E - 62	BAGUMBANG ELEM. SCHOOL	-Only one classroom is lacking. Proposed site is a rice paddy and extensive land reclamation work would be necessary.	3, 4
24	E - 63	LAPASAN EAST CITY CENTRAL SCHOOL	-No land ownership or legitimate land lease certificate.	11
25	E - 64	BALINGASAG CENTRAL SCHOOL	-No classroom shortage exists.	3
26	E - 66	MANTICAO CENTRAL SCHOOL	-No classroom shortage exists. Bearing ground is weak.	3, 4
27	E - 73	STA. JOSEFA CENTRAL SCHOOL	-Bearing ground is weak.	4
28	AE - 85	BONIFACIO ELEMENTARY SCHOOL	-No land ownership or legitimate land lease certificate	11

Secondary Schools Region VI				
	SCHOOL No.	SCHOOL NAMES	PROBLEM	Section Criteria No.
29	S - 3	DONA H.S. BENEDICT NAT'L. HIGH SCHOOL (SAN MIGUEL)	-No land ownership or legitimate land lease certificate.	11
30	S - 10	T.V. CANJA-STA. TERESA NAT'L. HIGH SCHOOL	-The site is located on a small island.	14
31	AS - 10	LININGWAN NAT'L. HIGH SCHOOL	-The site is located on a small island.	14
Region VII				
	SCHOOL No.	SCHOOL NAMES	PROBLEM	Section Criteria No.
32	S - 18	MANGA NAT'L. HIGH SCHOOL	-The site is located on rocks and extensive land reclamation work is required.	9, 12
33	S - 24	TAMPI NAT'L. HIGH SCHOOL	-No land ownership or legitimate land lease certificate.	11
34	S - 25	TAMBO COMPREHENSIVE HIGH SCHOOL	-Access road to the site is poor and it would be problematic during rainy seasons.	6, 8, 12
35	S - 29	DON A. SORIANO HIGH SCHOOL	-There is no space for new classroom construction.	5
Region X				
	SCHOOL No.	SCHOOL NAMES	PROBLEM	Section Criteria No.
36	S - 32	JABONGA NAT'L. HIGH SCHOOL	-The construction site is located on a river bank that is in dangerous condition because of progressing erosion. No other buildable land is available.	7
37	S - 43	PORTULIN NAT'L. HIGH SCHOOL	-Bearing ground is weak.	4
38	S - 44	KALILANGAN NAT'L. HIGH SCHOOL	-Proposed site is close to a cliff and is dangerous.	7
39	S - 34	SAN JUAN NAT'L. HIGH SCHOOL	-No classroom shortage exists.	3
40	S - 39	GINGOOG CITY NAT'L. HIGH SCHOOL	-Bearing ground is weak.	4
41	S - 41	BAYABAS NAT'L. HIGH SCHOOL	-Bearing ground is weak.	4

Table 2-3 List of Recipient Schools

School No.		Name of School	Location
New No.	Old No.		
ELEMENTARY SCHOOLS			
REGION VI			
E-01.	E- 01.	M. R. Araneta Elementary School	: Bago City, Bago City
E-02.	E- 03.	Tapi Elementary School	: Kabankalan, Negros Occidental
E-03.	E- 05.	Alim Elementary School	: Hinoba-an, Negros Occidental
E-04.	E- 06.	Ricky Elementary School	: Sagay, Negros Occidental
E-05.	E- 08.	Gargato Elementary School	: Ilimigaran, Negros Occidental
E-06.	AE- 2.	Bacuyangan Elementary School	: Hinoba-an, Negros Occidental
E-07.	AE- 3.	Cabacungan Elementary School	: La Castellana, Negros Occidental
E-08.	E- 09.	Guinhalaran Elementary School	: Silay City, Silay City
E-09.	E- 10.	Mandalagan Elementary School	: Bacolod City, Bacolod City
E-10.	E- 11.	Andres Bonifacio Elementary School	: Cadiz City, Cadiz City
E-11.	E- 21.	D. A. Salazar Jr. Elementary School	: San Jose, Antique
REGION VII			
E-12.	AE-33.	Pitar Elementary School	: Pilar, Bohol
E-13.	E- 31.	San Pascual Elementary School	: Ubay, Bohol
E-14.	E- 33.	Talibon Central School	: Talibon, Bohol
E-15.	E- 35.	Tugas Elementary School	: Candijay, Bohol
E-16.	E- 37.	Lipata Central School	: Minglanilla, Cebu
E-17.	E- 38.	Langtad Elementary School	: Naga, Cebu
E-18.	E- 39.	Nailon Elementary School	: Naga, Cebu
E-19.	AE-34.	Naga I Central School	: Naga, Cebu
E-20.	AE-35.	Tuburan Central School	: Tuburan, Cebu
E-21.	E- 41.	Guadalupe Elementary School	: Cebu City, Cebu City
E-22.	E- 42.	Talamban Elementary School	: Cebu City, Cebu City
E-23.	E- 44.	Mactan Elementary School	: Lapu-Lapu City, Lapu-Lapu City
E-24.	E- 45.	Basak Elementary School	: Lapu-Lapu City, Lapu-Lapu City
E-25.	E- 46.	D C C T Memorial School	: Mabinay, Negros Oriental
E-26.	E- 47.	Malabunan Elementary School	: Siaton, Negros Oriental
E-27.	E- 48.	Banga Central School	: Bayawan, Negros Oriental
REGION X			
E-28.	AE-51.	Santiago Central Elementary School	: Santiago, Agusan del Norte
E-29.	E- 54.	Ong Yiu Central Elementary School	: Butuan City, Butuan City
E-30.	E- 55.	Obrero Elementary School	: Butuan City, Butuan City
E-31.	E- 65.	Alubijid Central School	: Alubijid, Misamis Oriental
E-32.	E- 67.	Valencia Central School	: Valencia, Bukidnon
E-33.	E- 68.	Malaybalay Central School	: Malaybalay, Bukidnon
E-34.	E- 69.	Maramag Central School	: Maramag, Bukidnon
E-35.	AE-75.	Damilag Elementary School	: Manolo Fortich, Bukidnon
E-36.	E- 70.	Kisolon Central School	: Sumilao, Bukidnon
E-37.	E- 71.	Trento Central Elementary School	: Trento, Agusan del Sur
E-38.	E- 72.	East Prosperidad Central Elementary School	: Prosperidad, Agusan del Sur
E-39.	E- 74.	Bayugan Central Elementary School	: Bayugan, Agusan del Sur

School No. New No.	Name of School Old No.	Location
SECONDARY SCHOOLS		
REGION VI		
S-01.	S- 01. R. Torres National High School	: Malingin, Bago City
S-12.	S- 02. Dona H.S. Benedicto National High School	: San Miguel, La Carlota City
S-03.	S- 04. J. Ledesma National High School	: San Carlos City, San Carlos City
S-04.	S- 05. La Castellana National High School	: La Castellana, Negros Occidental
S-05.	S- 06. Himamaylan National High School	: Himamaylan, Negros Occidental
S-06.	S- 07. Dona. M. Lopez National High School	: Capt. Ramon, Silay City
S-07.	S- 08. MRRP National High School	: Bacolod City, Bacolod City
S-08.	S- 09. Mabini Memorial High School	: Cadiz City, Cadiz City
S-09.	S- 14. Pis-Anan National High School	: Sibalon, Antique
S-10.	AS-23. San Roque-Espeleta National High School	: Anini-y, Antique
REGION VI		
S-11.	S- 19. Tabalong National High School	: Dauis, Bohol
S-12.	AS-32. Inabanga National High School	: Inabanga, Bohol
S-13.	S- 21. Carmen National High School	: Carmen, Cebu
S-14.	AS-34. Mantalongon National High School	: Carmen, Cebu
S-15.	AS-35. Sta. Lucia National High School	: Asturias, Cebu
S-16.	AS-36. Cogon National High School	: Dumanjug, Cebu
S-17.	S- 22. Ramon Duterte Municipa High School	: Cebu City, Cebu City
S-18.	S- 23. Marigondon National High School	: Lapu-Lapu City, Lapu-Lapu City
S-19.	AS-39. Siaton Comprehensive High School	: Siaton, Negros Oriental
S-20.	S- 30. Mandaue City Comprehensive Nat'l High School	: Mandaue City, Mandaue City
REGION X		
S-21.	AS-81. Sibagat Nat'l High School	: Sibagat, Agusan del Sur
S-22.	S- 46. Lapinigan Nat'l High School	: San Francisco, Agusan del Sur
S-23.	S- 40. Calamba Nat'l High School	: Calamba, Misamis Occidental
S-24.	AS-63. Misamis Occidental Nat'l High School	: Oroquieta City, Misamis Occidental
S-25.	AS-67. Senote Nat'l High School	: Oroquieta City, Misamis Occidental
S-26.	S- 42. Tagoloan Nat'l High School	: Tagoloan, Misamis Oriental
S-27.	S- 45. Kitao tao Nat'l High School	: Kitao- tao, Bukidnon
S-28.	AS-79. Impasugong Comprehensive High School	: Impasugong, Bukidnon
S-29.	S- 33. Libertad Nat'l High School	: Butuan City, Butuan City
S-30.	S- 38. Labinay Nat'l High School	: Ozamiz City, Ozamiz City

in which they are located. Transition of the selection of the schools for this project is explained in Section 6 of reference materials.

Table 2-4 Number of Recipient Schools by Regions

Region	Island	Province	ELEMENTARY SCHOOL	SECONDARY SCHOOL	SUB TOTAL	
RegionVI	PANAY	ANTIQUE	1	2	3	21
	NEGROS	NEGROS OCCIDENTAL	10	8	18	
RegionVII	NEGROS	NEGROS ORIENTAL	3	1	4	26
	CEBU	CEBU	9	7	16	
	BOHOL	BOHOL	4	2	6	
RegionX	MINDANAO	AGUSAN DEL NORTE	3	1	4	22
		AGUSAN DEL SUR	3	2	5	
		MISAMIS ORIENTAL	1	1	2	
		BUKIDNON	5	2	7	
		MISAMIS OCCIDENTAL	0	4	4	
Total			39	30	69	

(2)-2 Overlapping of Financial Aid With Other Organizations

Among the schools requested for the Project by DECS, there were many that were covered by other financial aid organizations: 10 schools in the Secondary Schools' Educational Facilities Improvement Program to receive financial aid from the Government of Japan, 14 schools in the Science and Mathematics Education Program with financial aid from the Australian International Development Assistance Bureau (AIDAB), and one school in the science and Technology Education Program financed by the World Bank. The Project's secondary schools that are included in the financial aid programs will not be provided with science laboratory equipment units under this Project. Schools that were covered by other financial aid organizations are listed in Table 2-5. As a result, 13 schools were evaluated as eligible for the project and are listed in Table 2-6.

Table 2-5 Project Schools with Another Foreign Assisted Science Laboratory Equipment program

School No.	School Names	SEP (JICA)	PASMEP	ESEP
S - 1	R. TORRES NAT'L. HIGH SCHOOL	○(PHASE 2)		
S - 5	LA CASTELLANA NAT'L. HIGH SCHOOL	○(PHASE 2)		
S - 6	HIMAMAYLAN NHS	○(PHASE 2)		
S - 14	PIS-ANAN NAT'L. HIGH SCHOOL	○(PHASE 2)		
S - 21	CARMEN NAT'L. HIGH SCHOOL		○(PHASE 1)	
S - 22	RAMON DUTERTE MEM. NATIONAL HIGH SCHOOL		○(PHASE 1)	
S - 23	MARIGONDON NAT'L. HIGH SCHOOL		○(PHASE 1)	
S - 30	MANDAUE CITY COMPREHENSIVE NAT'L. HIGH SCHOOL		○(PHASE 1)	○(PHASE 1)
S - 33	LIBERTAD NAT'L. HIGH SCHOOL		○(PHASE 2)	
S - 38	LABINAY NAT'L. HIGH SCHOOL		○(PHASE 1)	
S - 45	KITAOTAO NAT'L. HIGH SCHOOL		○(PHASE 1)	
S - 46	LAPINIGAN NAT'L. HIGH SCHOOL		○(PHASE 1)	
AS - 34	MANTALONGON NAT'L. HIGH SCHOOL		○(PHASE 1)	
AS - 36	COGON NAT'L. HIGH SCHOOL		○(PHASE 1)	
AS - 39	SIATON COMPREHENSIVE HIGH SCHOOL		○(PHASE 1)	
AS - 63	MISAMIS OCCIDENTAL NAT'L. HIGH SCHOOL		○(PHASE 1)	
AS - 81	SIBAGAT NAT'L. HIGH SCHOOL	○(PHASE 2)		

Table 2-6 List of Science Laboratory Equipment Recipient Schools

School No.	Name of School	Location
REGION VI		
S- 02.	Dona H.S. Benedicto National High School	: San Miguel, La Carlota City
S- 04.	J. Ledesma National High School	: San Carlos City, San Carlos City
S- 07.	Dona. M. Lopez National High School	: Silay City, Capt. Ramon
S- 08.	MRRP National High School	: Bacolod City, Bacolod City
S- 09.	Mabini Memorial School	: Cadiz City, Cadiz City
AS-23.	San Roque-espeleta national High School	: Anini-y, Antique
REGION VII		
S- 19.	Tabalong National High School	: Dauis, Bohol
AS-32.	Inabanga National High School	: Inabanga, Bohol
AS-35.	Sta. Lucia National High School	: Asturias, Cebu
REGION X		
S- 40.	Calamba National H.S.	: Calamba, Misamis Occidental
AS-67.	Senote Nat'l. H.S.	: Oroquieta City, Misamis Occidental
S- 42.	Tagoloan Nat'l. H.S.	: Tagoloan, Misamis Occidental
AS-79.	Impasugong Comprehensive H.S.	: Impasugong, Bukidnon

It was found that science laboratories were already provided to 3 schools through the construction of school buildings from other supporting agencies. An agreement was made between DECS and the Japanese team that the science laboratories would not be provided to these schools. Table 2-7 indicates the project schools already provided with a science laboratory.

Table 2-7 Project Schools already provided with Science Laboratory

School No.	School Names	Name of Aid Organization
S - 1	R. TORRES NAT'L. HIGH SCHOOL	USAID and ESF
S - 30	MANDAUE CITY COMPREHENSIVE NAT'L. HIGH SCHOOL	World Bank
AS- 39	SIATON COMPREHENSIVE HIGH SCHOOL	ADB

(3) Ratio of the Elementary and the Secondary Schools

With the free education policy of secondary schools enforced in 1988, the increase in the number of secondary school students is more significant compared with that of elementary schools. During the fiscal year from 1988 to 1994, the number of the students attending elementary schools increased by an average of 942,000, or 1.29% of students. In secondary schools, numbers increased by 829,000, which was 5.17% of students. Thus 4,000 classrooms are required annually to accommodate these students.

The increase rates of the number of students in secondary schools in Region VII and X, which are the areas included in this project, are the second and the seventh highest in the Philippines. Region VI, which is another area included in the project, has an increase rate second from the bottom in the nation, but even this increase rate is higher than the average increase rate of students at elementary schools in other regions. Table 2-8 shows the transition of the increase of students during the seven years for each region.

The average numbers of the students in an elementary school classroom in 1993 were 33.35 students per classroom and 74.10 students per classroom in secondary schools. As shown here, even with regard to the number of students per classroom, secondary schools show a much higher number than elementary schools. Especially in NCR, Region III, IV, V, VII, XI, XII and ARMM, the numbers are high. Among these regions, Region V, XI and XII are already included in this project. In Region VI, VII and X, which are included in this project, the numbers of the students per classroom at secondary schools compared with the national basis are as follows: while Region VI has the sixth highest, Region VII has the fifth highest, and Region X has the twelfth highest numbers for secondary schools, and the numbers for elementary schools for each of them are the eleventh, the tenth, and the fourteenth highest respectively. Thus it can be said that the number of classrooms required is higher in secondary schools than in elementary schools in all the regions. Table 2-9 shows the number of students per classroom.

With regard to the number of students per classroom at the schools included in this project, the numbers are higher for secondary schools than for elementary schools in all the areas. Table 2-10 shows the number of students per classroom at the 110 schools.

Table 2-8 Increase of Students (1988-1995)

	Region	1988-1989	1989-1990	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	Increase rate Average
Elementary School	NCR	819,689	855,180	869,179	861,588	879,102	879,818	894,590	
	Increase rate	-	4.33%	1.64%	-0.87%	2.03%	0.08%	1.68%	1.48%
	CAR	171,235	181,211	179,951	181,530	180,889	194,923	192,518	
	Increase rate	-	5.83%	-0.70%	0.88%	-0.35%	7.76%	-1.23%	2.03%
	Region I	546,386	559,374	581,398	573,644	577,472	577,647	566,749	
	Increase rate	-	2.38%	3.94%	-1.33%	0.67%	0.03%	-1.89%	0.63%
	Region II	374,163	380,673	385,658	388,192	394,660	396,353	400,735	
	Increase rate	-	1.74%	1.31%	0.66%	1.67%	0.43%	1.11%	1.15%
	Region III	922,320	942,440	969,534	946,746	952,715	941,532	958,926	
	Increase rate	-	2.18%	2.87%	-2.35%	0.63%	-1.17%	1.85%	0.67%
	Region IV	1,280,775	1,313,786	1,319,418	1,330,335	1,340,903	1,349,136	1,388,336	
	Increase rate	-	2.58%	0.43%	0.83%	0.79%	0.61%	2.91%	1.36%
	Region V	717,773	734,599	741,639	747,764	759,380	765,328	775,630	
	Increase rate	-	2.34%	0.96%	0.83%	1.55%	0.78%	1.35%	1.30%
	Region VI	896,519	906,063	907,815	920,171	924,119	929,517	941,163	
	Increase rate	-	1.06%	0.19%	1.36%	0.43%	0.58%	1.25%	0.81%
	Region VII	683,370	692,067	705,003	718,754	722,408	732,387	753,434	
	Increase rate	-	1.27%	1.87%	1.95%	0.51%	1.38%	2.87%	1.64%
	Region VIII	529,477	534,622	535,346	555,397	564,081	543,988	547,793	
	Increase rate	-	0.97%	0.14%	3.75%	1.56%	-3.56%	0.70%	0.59%
	Region IX	543,271	559,470	554,665	577,552	444,935	475,867	469,213	
	Increase rate	-	2.98%	-0.86%	4.13%	-22.96%	6.95%	-1.40%	-1.86%
	Region X	581,591	614,227	604,233	609,426	627,128	628,642	643,947	
	Increase rate	-	5.61%	-1.63%	0.86%	2.90%	0.24%	2.43%	1.74%
Region X I	711,434	740,532	741,511	749,281	756,517	776,545	794,063		
Increase rate	-	4.09%	0.13%	1.05%	0.97%	2.65%	2.26%	1.86%	
Region X II	545,634	590,178	629,225	644,337	358,563	371,950	380,258		
Increase rate	-	8.16%	6.62%	2.40%	-44.35%	3.73%	2.23%	-3.53%	
ARMM	N/A	N/A	N/A	N/A	411,544	349,572	358,948		
Increase rate	-	-	-	-	-	-15.06%	2.68%	-6.19%	
Total	9,323,637	9,604,422	9,724,575	9,804,717	9,894,416	9,913,205	10,066,303		
Increase rate	-	3.01%	1.25%	0.82%	0.91%	0.19%	1.54%	1.29%	
Secondary School	NCR	316,983	323,251	327,129	343,138	366,800	384,159	409,509	
	Increase rate	-	1.98%	1.20%	4.89%	6.90%	4.73%	6.60%	4.38%
	CAR	42,899	43,624	45,881	49,287	49,991	55,518	58,598	
	Increase rate	-	1.69%	5.17%	7.42%	1.43%	11.06%	5.55%	5.39%
	Region I	184,312	191,286	198,003	211,448	219,189	230,156	239,559	
	Increase rate	-	3.78%	3.51%	6.79%	3.66%	5.00%	4.09%	4.47%
	Region II	83,589	90,404	93,142	102,562	109,831	119,400	120,583	
	Increase rate	-	8.15%	3.03%	10.11%	7.09%	8.71%	0.99%	6.35%
	Region III	201,759	224,671	214,024	246,853	262,177	283,588	296,052	
	Increase rate	-	11.36%	-4.74%	15.34%	6.21%	8.17%	4.40%	6.79%
	Region IV	292,452	315,860	332,482	355,990	389,590	411,915	429,209	
	Increase rate	-	8.00%	5.26%	7.07%	9.44%	5.73%	4.20%	6.62%
	Region V	166,528	189,239	183,046	194,589	201,730	222,511	225,692	
	Increase rate	-	13.64%	-3.27%	6.31%	3.67%	10.30%	1.43%	5.35%
	Region VI	291,110	323,267	322,603	329,841	328,610	351,930	352,221	
	Increase rate	-	11.05%	-0.21%	2.24%	-0.37%	7.10%	0.08%	3.32%
	Region VII	125,468	128,968	140,912	148,630	156,224	176,517	194,288	
	Increase rate	-	2.79%	9.26%	5.48%	5.11%	12.99%	10.07%	7.62%
	Region VIII	136,739	137,464	140,281	143,263	152,841	160,680	163,066	
	Increase rate	-	0.53%	2.05%	2.13%	6.69%	5.13%	1.48%	3.00%
	Region IX	107,264	113,705	113,381	123,421	144,492	123,602	131,158	
	Increase rate	-	6.00%	-0.28%	8.86%	17.07%	-14.46%	6.11%	3.88%
	Region X	133,528	136,754	139,193	143,638	155,595	168,462	176,046	
	Increase rate	-	2.42%	1.78%	3.19%	8.32%	8.27%	4.50%	4.75%
Region X I	163,136	173,321	180,915	185,045	198,790	214,867	236,882		
Increase rate	-	6.24%	4.38%	2.28%	7.43%	8.09%	10.25%	6.44%	
Region X II	108,853	124,915	118,047	117,836	96,481	110,556	104,213		
Increase rate	-	14.76%	-5.50%	-0.18%	-18.12%	14.59%	-5.74%	-0.03%	
ARMM	N/A	N/A	N/A	N/A	46,019	43,317	46,744		
Increase rate	-	-	-	-	-	-5.87%	7.91%	1.02%	
Total	2,354,620	2,516,729	2,549,039	2,695,541	2,878,360	3,057,178	3,183,820		
Increase rate	-	6.88%	1.28%	5.75%	6.78%	6.21%	4.14%	5.18%	

With regard to the number of schools lacking in classrooms which are included in this project, one elementary school and ten secondary schools required more than twenty classrooms, which indicates that the need for classrooms in secondary schools is higher. Thus it can be concluded that there is a serious lack of secondary school classrooms throughout the Philippines. In addition, the Barangay schools which have rented the facilities of other elementary schools in the community were obliged to secure their own lots and school buildings. Lack of educational facilities at secondary schools causes serious problems leading to a worse situation. 11 of the 43 secondary schools included in this project, or 26%, are renting the facilities of elementary schools.

The Government of the Philippines placed emphasis on secondary education in the Phases I to IV of the Project for Constructing Primary and Secondary Schoolbuilding. Construction was conducted with a ratio of 30% for the elementary and 70% for the secondary schools. However, in Phase V of the Project for Constructing Primary and Secondary Schoolbuildings and in Phase I and II of the Project for the Improvement of the Educational Facilities, elementary education was targeted. Thus construction was conducted with a ratio of 70% for the elementary and 30% for the secondary schools. The Government of the Philippines aims to raise the ratio of students attending elementary school to 100% by the year 2000. Under its "Education for All" policy, the government aims to reduce disparities by constructing elementary schools in remote areas. However, having considered the significant lack of secondary school classrooms in these areas too, it remained valid to prioritize the construction of classrooms for secondary schools. The ratio of the construction of elementary and secondary schools in the already implemented schoolbuilding construction projects is shown in table 2-11.

Table 2-9 Number of Students per Classroom

Region	Elementary School	Rank	Secondary School	Rank	
NCR	59.27	1	83.73	2	
CAR	56.37	2	42.87	15	
REGION I	26.12	15	58.79	11	
REGION II	29.36	12	57.16	14	
REGION III	32.16	9	76.96	4	
REGION IV	33.52	6	78.52	3	Phase I
REGION V	33.45	7	64.85	8	Phase II
REGION VI	30.48	11	61.24	10	Phase III
REGION VII	32.07	10	75.99	5	Phase III
REGION VIII	27.43	13	62.69	9	
REGION IX	32.35	8	58.00	13	
REGION X	27.25	14	58.49	12	Phase III
REGION X I	37.06	4	69.18	6	Phase II
REGION X D	34.65	5	66.16	7	Phase II
ARMM	38.15	3	196.90	1	Phase II
Nat'l. Average	33.35		74.10		

(Note) No. of Students(1993) ÷ No. of Classrooms

Table 2-10 Number of Students per Classroom at the 110 Candidate Schools

Region	Elementary School	Secondary School
REGION VI	41.4	54.0
REGION VII	46.8	61.1
REGION X	44.7	55.5

Table 2-11 Ratio of the Construction of Elementary and Secondary Schools
in the Already Implemented School Building Construction Project

	Year (%)	Elementary School		Secondary School		Educational Policy
		Target (%)	Implemented (%)	Target (%)	Implemented (%)	
TRSBP(Phase I)	1988	30	30.56	70	69.44	•Free Secondary Education started in the year 1988. •"Education For All" both Elementary and Secondary School.
(Phase II)	1990	30	31.88	70	68.12	
(Phase III)	1991	30	30.56	70	69.44	
(Phase IV)	1992	30	30.56	70	69.44	
(Phase V)	1993	70	66.76	30	33.33	
EFIP (Phase I)	1993	70	70.00	30	30.00	•Acceptance of 6.5 years old for Grade 1 from June, 1994. •Acceptance of 6 years old for Grade 1 from June, 1995.
(Phase II)	1994	70	67.52	30	32.48	
(Phase III)	1995	70	56.52	30	43.48	

Note) TRSBP: The Project for Constructing Primary & Secondary Schoolbuildings.

EFIP : The Project for the Improvement of the Educational Facilities.

2-3 Basic Design

2-3-1 Design Concept

The purpose of the Project is to construct school buildings and provide basic educational equipment to alleviate classroom shortages of the existing elementary and secondary schools that are scattered throughout Region VI, VII and X. Based on the request of the Government of the Philippines and the results of discussions held with DECS during the site survey period, the Basic Design of the Project was prepared along with the following policies:

(1) Policy For Natural Conditions

The Project Area is located in the hot, high humidity tropical zone. To provide a comfortable environment for educational activities, the design of facilities should be prepared by taking into account natural ventilation and heat insulation capabilities.

Project facilities will be used as evacuation areas for residents during natural calamities as well as for educational purposes. The facilities should be designed to be strong enough to withstand such natural calamities. In particular, the roofs of buildings are subject to typhoon damage and should be designed to withstand strong winds thereby minimizing building damage.

(2) Design Policies for Social Condition

In designing the facility, the schoolbuilding standards of the Philippines and the living mode of the people must be respected. As the school facilities may be used as places to evacuate during natural calamities, and to accommodate double-shift classes or night classes for non-formal education, the design should be such as to accommodate these conditions. Furthermore, in compliance with the Accessibility Law of the Philippines (BATAS PAMBANSA BILANG 344), the facilities must be able to accommodate physically handicapped students.

(3) Design Policies for Local Construction Field Situations

There is a National Building Code of the Philippines that corresponds to the Building Design Standards in Japan. As in Japan, it is mandatory to submit formal applications to obtain the various permits needed to start construction.

As for the domestic construction contractors and consultants concerned, their engineering skills are generally high. Thus they will be employed for this project.

(4) Policies for Using Local Firms, Equipment and Materials

There are no problems with regard to the local construction contractors and local consultant firms. Thus, they may work under the guidance of Japanese engineers and receive the transfer of technology. The quality of local products and the level of engineering are thought to be satisfactory. However, for those materials, such as concrete, where the strength is affected by the accuracy of the construction, a durability test will be conducted.

(5) Design Policies for the Project Implementing Agency's Maintenance and Management Capabilities

By taking into consideration the financial difficulties being experienced by the Government of the Philippines, school facilities shall be planned by placing top priority on easy, minimum cost maintenance and management work once facility construction has been completed. In addition, consideration shall be given to the use of domestic materials for effecting simple repairs to damaged or deteriorated facilities.

It would be beneficial to encourage area residents to participate in Project construction by performing such work as land clearing, fence building, etc. In this way, they can become aware of the need for maintenance and management of the school buildings.

(6) Design Policies for the Scope and Level of Project Facilities and the Equipment to be provided

The contents of the Project include the construction of classrooms and toilets for elementary schools, and classrooms, science laboratories, and toilets for secondary schools, and for the furnishing of associated basic education equipment. The facilities and equipment will provide the basic necessities for education and they should be planned so as to allow comfortable daily classroom activities.

For facility design, emphasis shall be placed not only on classroom use for study purposes but also for multipurpose use, such as places of refuge during natural calamities.

The equipment plan shall be made so as to provide basic units that are necessary for class activities, such as blackboards and furniture. In view of maintenance and management, these units shall be procured locally.

The quality of locally made science laboratory instruments are generally poor; thus, they shall be acquired in Japan. Furthermore, a Japanese specialist shall be dispatched to provide guidance in the use of the instruments once they are turned over to the Philippine side.

(7) Policy on the period of construction

In this project, the school buildings of elementary and secondary schools are scattered over a vast area stretching 480 km from north to south and 440 km from east to west and consisting of five islands including the west end of Panay, Negros, Cebu, Bohol, and Mindanao islands. Because a large number of school buildings must be constructed, simultaneously in a short period of time, eight construction bases will be established. Construction work will be supervised by each work area so that the construction plan can be followed closely to complete the project on time. In the cities of Manila and Cebu, which are centrally located in the areas included in this project and convenient to access all the cities, Japanese consultants will be stationed there all the time as the head office to supervise the work.

(8) Policy to use the participation of residents

In the Philippines, the system to maintain the educational facilities was rationalised in June, 1994. Thus it has emerged that a certain amount is allocated to each school by DECS via the regional office and the district office according to the size of the activities of each school. However, in reality, this amount has not been appropriated, and the maintenance costs are paid by the contribution from the PTA, communities or politicians. In addition, schools ask each family to donate about ten pesos (about thirty-five yen) a month for each student. Such a custom is conducted throughout the Philippines for both the public and the private schools. In this way, it is often seen that repair of educational equipment, donation of construction equipment, cleaning, repair, and painting of school buildings, emergency repair of school buildings that are damaged by natural disasters, landscaping, and the construction of school buildings, gates, or fences using waste woods are conducted by the local residents especially by the members of the PTA.

Based on these facts, success of this project lies on how to enlighten the PTA or communities on the importance of maintaining the facilities and to increase the participation of communities to the cleaning and

repair work of school buildings or the regular maintenance.

As a result of this study, 64 schools out of 69, or 92.8%, indicated that participation from communities was possible. Participation of residents must be requested after really understanding the nature of the Philippines. However, plans will be made so that the long term maintenance will be undertaken by the residents through inviting the active participation of residents in the preparation of the construction site before starting the work, removal of existing facilities, exterior work such as landscape and cleaning before the completion and delivery of facilities, and by raising the recognition of residents that the facilities belong to them.

2-3-2 Examination of Design Conditions

In establishing the size of the facility, an appropriate size was selected from the 10 types used in Phase I and the 12 types used in Phase II, thus the plan can handle different site situations, facility size and the classroom needs at each school. Because an emphasis is placed on the number of schools to be constructed within a limited budget, only one size 3 classroom type was uniformly determined. In determining the size of the classroom, the size was set at 8 m by 7 m (56 m²) for the classroom and 8 m by 10.5 m (84 m²) for the laboratory according to the facility standard of the DECS of the Philippines. This size is slightly smaller than that of Japan, but determined valid considering the layout of furniture. In addition, the height of the ceiling was determined as 3.07 m taking into consideration the room temperature. The classrooms are planned to be separately constructed from the toilet or science laboratories which need water supply and sanitation system by considering the odor and enabling the effective water supply and sanitation. As the toilet facility, boy's toilet will have two closet bowls and parallel urinals of 1.7 m high, girl's toilet will have three closet bowls, and the separate toilet for the physically handicapped will be constructed.

Table 2-12 shows the comparison between the applicable laws and the sizes adopted in the project. Tables 2-13 and 2-14 show the facility size and the scale of entire size of the project.

Table 2-12 Comparison between Philippine Construction Standards and the Adopted Sizes

The National Building Code (1992 Edition)	Project Facilities
Section 805. Ceiling Heights Rooms with a natural ventilation shall have ceiling heights not less than 2.70 meters.	Ceiling Heights: 3.07m
Section 807. Air Space Requirements in Determining the Size of Rooms Schools rooms - 3.00m ³ with 1.00m ² of floor area per person of minimum air space shall be provided.	Elementary School: 4.30m ³ with 1.40m ² of floor area per person Secondary School: 4.10m ³ with 1.30m ² of floor area per person

Table 2-13 Facility size

Building Type	No. of Stories	No. of Classrooms	Room Area (m ²)	Open Corridor (m ²)	Area (m ²)	Number of Students
Elementary Schools						
Classroom	1	3	168.00	31.50	199.50	120
Toilet	1	-	26.03	10.27	36.30	-
Secondary Schools						
Classroom	1	3	168.00	31.50	199.50	126
Science Laboratory, Toilet	1	1	84.00+30.96	35.80	150.76	42
Toilet	1	-	26.03	10.27	36.30	-

Table 2-14 Scale of entire project

	Building Type/ Room Name	One Unit of Schoolbuilding			No. of School	Total		
		No. of Classrooms	No. of Students	Floor Area (m ²)		No. of Classrooms	No. of Students	Floor Area (m ²)
Elementary School	Classrooms/ Toilet	3	120	199.50+ 36.30=235.80	39	117	4,680	9,196.20
	Sub Total				39	117	4,680	9,196.20
Secondary School	Classrooms/ Science Laboratory/ Toilet	3	126	199.50+150.76=350.26	27	81	3,402	9,457.02
	Classrooms/ Toilet	3	126	199.50+ 36.30=235.80	3	9	378	707.40
	Sub Total				30	90	3,780	10,164.42
Total					69	207	8,460	19,360.62

Note) 1. No. of Classrooms does not include Science Laboratory.
2. Area include Area of Open Corridor.