

**BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR CONSTRUCTING
PRIMARY AND SECONDARY SCHOOLS
IN
THE REPUBLIC OF THE PHILIPPINES**

AUGUST 1988

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

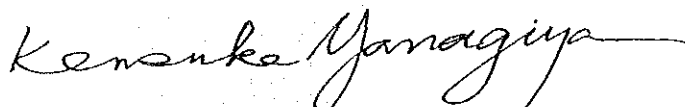
In response to the request of the Government of the Republic of the Philippines, the Government of Japan decided to conduct a Basic Design Study on the Project for Constructing Primary and Secondary Schools and the Japan International Cooperation Agency (JICA) sent to the Philippines a study team headed by Mr. Juro Chikaraishi, Second Basic Design Study Division, Grant Aid Planning and Survey Department, JICA from June 15 to July 4, 1988.

The team had a discussions with the officials concerned of the Government of the Philippines and conducted a field survey in Bicol areas. After the team returned to Japan, further studies were made and the present Report has been prepared.

I hope that this Report will serve for the development of the Project and contribute to the promotion of friendly relations between the two countries.

I wish to express my deep appreciation to the officials concerned of the Government of the Republic of the Philippines for their close cooperation extended to the team.

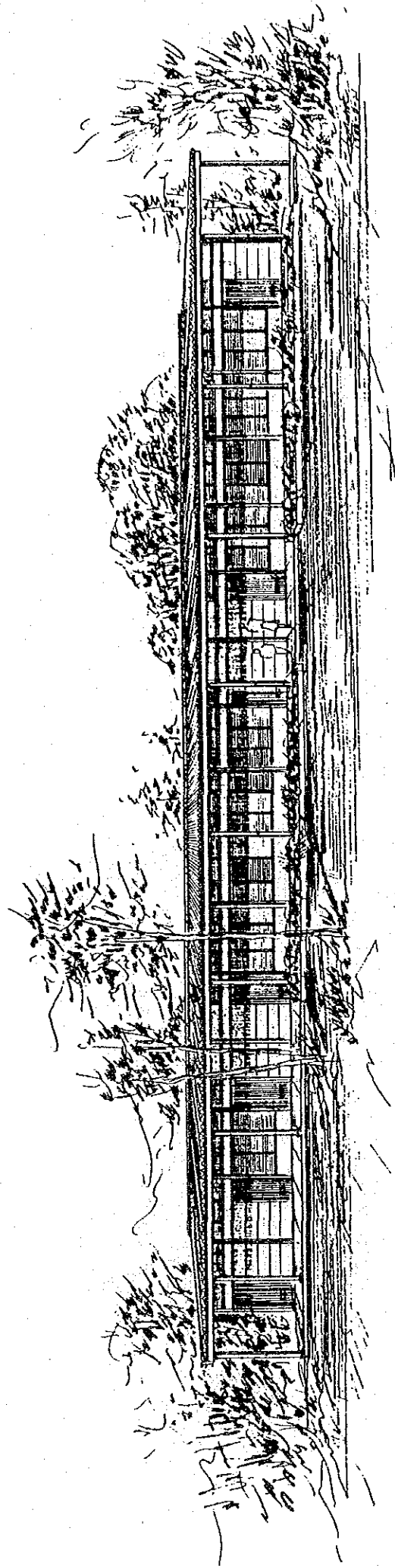
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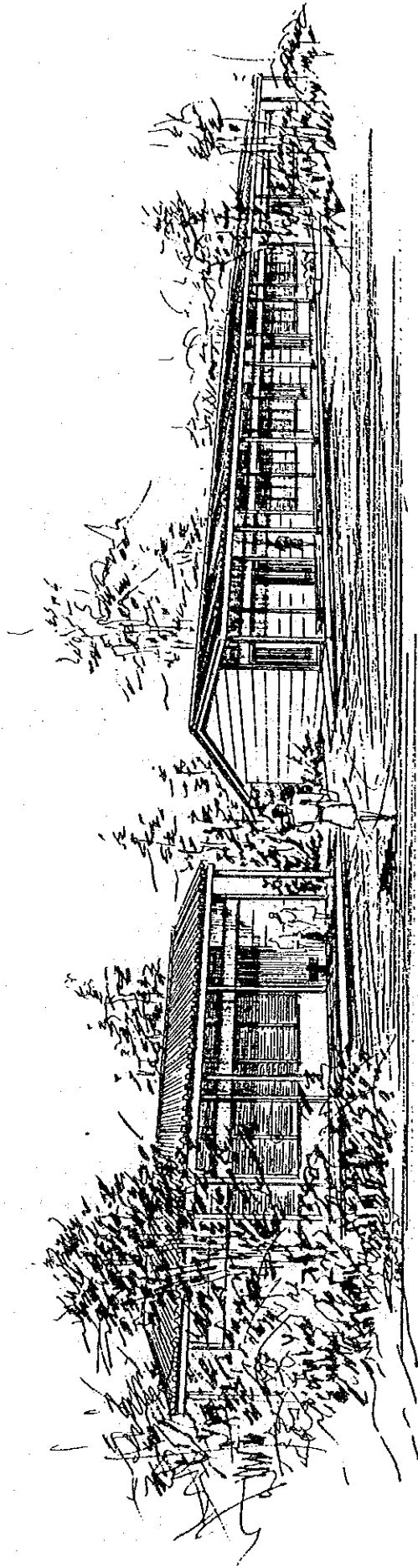
Kensuke Yanagiya

President

Japan International Cooperation Agency

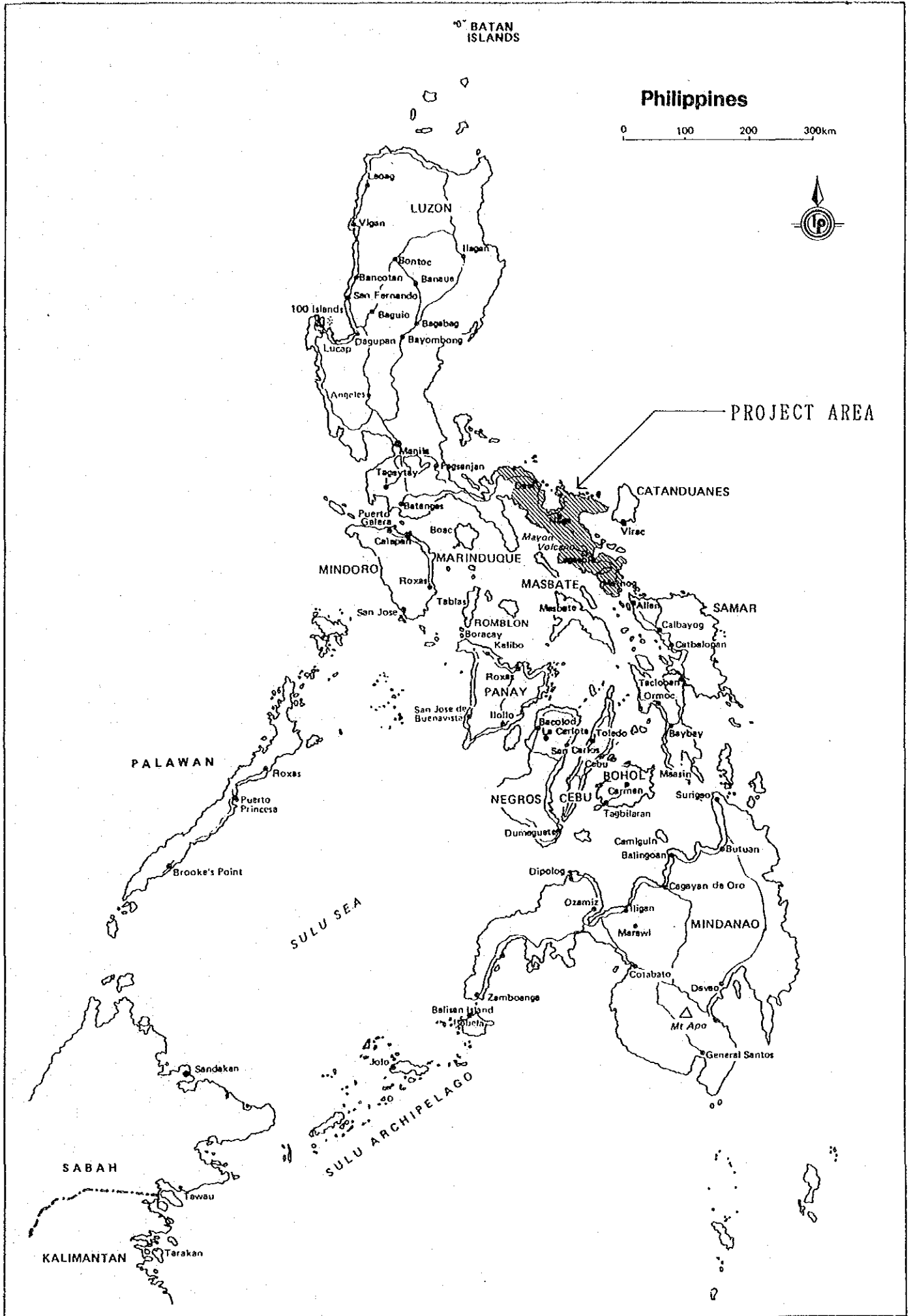


Perspective Drawing for the Primary School: Type B

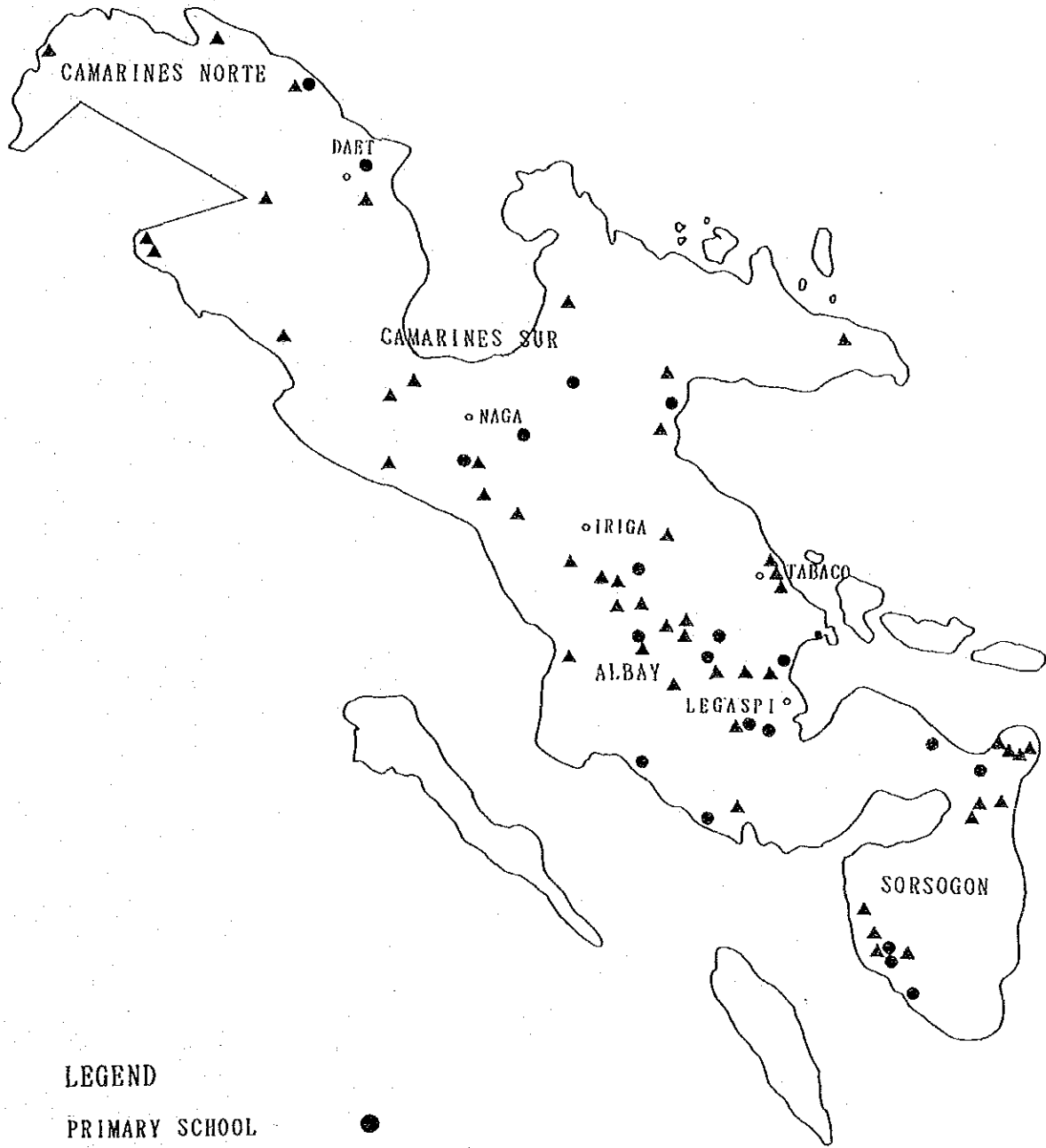


Perspective Drawing for the Secondary School: Type C

Map of the Philippines



Project Location Map



LEGEND

- PRIMARY SCHOOL ●
- SECONDARY SCHOOL ▲
- CITY ○

SUMMARY

SUMMARY

The Government of the Republic of the Philippines (hereinafter referred to as "Philippines") established the Five-year Education Development Plan (1983-1987) and has been making every effort to provide equal educational opportunities to more children by increasing school facilities, granting scholarships, etc. As a result, the number of school children increased from 13.2 million in 1983 to 14.4 million in 1986. However, due to the indigence of individual households, and the lack of the government's educational budget, the total school enrolment ratio decreased from 63.8% to 62.5% during the same period of time, and the money spent for each of the primary and secondary school students decreased also. In 1985, some 3.4 million school age children could not attend school.

By taking into account the situations seriously, the Government of the Philippines incorporated the Education and Manpower Development Program in the Medium-term Philippine Development Plan (1987-1992) and has been making efforts to improve the educational situations by upgrading the qualities of education and training and strengthening the management structure of the education development plan.

As a school building program, the Government is aiming to construct 40,252 primary and secondary schools' classrooms; 3,598 multipurpose facilities, 1,608 workshops, and 804 science laboratories by 1992. In 1987, however, many school facilities in the Bicol Region and its surrounding area were seriously damaged by two large typhoons. Total damages to school facilities by those two typhoons in the Bicol Region were estimated to be approximately 300 million pesos.

In 1987, there were 2,845 primary and 426 secondary schools in the Bicol Region. In addition to the regular education in school, development of textbooks and improvement of teachers' capabilities have been actively conducted in the Region. However, school facilities chronically have shortages, and, due to the 1987 typhoon damages in particular, the daily school activities have been badly hindered.

For the above reasons, the Government of the Philippines, in the midst of financial difficulties, has been driven by necessity to restore or repair many schoolbuildings in a short period of time. Thus, the Government launched the Project for constructing primary and secondary schools (hereinafter referred to as "the Project") to rebuild the schoolbuildings for 360 schools selected throughout the country by the typhoon-resistant prefabricated method.

The Government chose 72 schools in the Bicol Region, that were most severely damaged, for the First Phase construction of the five-year plan and requested a grant aid to the Japanese Government for constructing the schoolbuildings. In response to the request, the Government of Japan sent to the Philippines a basic design study team from June 15 to July 4, 1988.

The study team had a series of discussions on the Project with the officials concerned of the Department of Education, Culture, and Sports (hereinafter referred to as "DECS"), the Project implementation agency, the Department of Public Works and Highways (hereinafter referred to as "DPWH") that will be responsible for the construction work to be borne by the Philippine side, and DPWH is also the agency responsible for the maintenance and management of the country's public facilities. The Team also had a series of discussions on the Project with the officials concerned of the DECS Bicol Regional office, and conducted the field surveys at some of the Project school sites.

The Project is a part of the Philippine Government's five-year School Building Program. Besides the Government of Japan, the Asian Development Bank, and the United States Agency for International Development are also expected to assist the five-year School Building Program.

The purpose of the Project is to construct 72 classroom building units of primary and secondary schools in the Bicol Region with typhoon-resistant prefabricated type structures. It was planned to construct the schoolbuildings by selecting a proper type from the proposed two primary and three secondary schoolbuilding types in accordance with the school size and need.

The primary and secondary schools selected for the Project are those that were seriously damaged by typhoons in 1986 and 1987. Most of these schools are located in populated areas. Schools having high social needs, such as for being used for places of refuge for area residents during natural calamities, were selected for the Project. The schools that may receive financial assistance from other foreign countries or international organizations are not included in the Project.

1. Summary of Schoolbuildings

(1) Primary Schools:

• A Type: 234 m ²	Classrooms (40 students per class):	3
	Office (4 persons):	1
	Toilet, for males:	1
	Toilet, for females:	1
• B Type: 288 m ²	Classrooms (40 students per class):	4
	Office (4 persons):	1
	Toilet, for males:	1
	Toilet, for females:	1

(2) Secondary Schools:

• A Type: 288 m ²	Classrooms (42 students per class):	3
	Science Laboratory (42 students):	1
	Toilet, for males:	1
	Toilet, for females:	1

• B Type: 342 m ²	Classrooms (42 students per class):	4
	Science Laboratory (42 students):	1
	Toilet, for males:	1
	Toilet, for females:	1
• C Type: 432 m ²	Classrooms(42 students per class):	4
	Science Laboratory (42 students):	1
	Workshops (42 students):	1
	Toilet, for males:	1
	Toilet, for females:	1

2. Summary of Equipment

(1) Primary Schools

- * Classrooms:
 - Teachers' desks, chairs, closets
 - Students' desk-chairs (large, medium, and small types) and closets
 - Blackboards and bulletin boards
- * Offices:
 - Teachers and clerks' desks, chairs, and closets
 - Lockers, blackboards, and bulletin boards

(2) Secondary Schools

- * Classrooms:
 - Teachers' desks and chairs
 - Students' desks, chairs, and closets
 - Blackboards and bulletin boards
- * Science Laboratories:
 - Experiment tables, and demonstration workbenches
 - Students' chair and closets
 - Blackboards, bulletin boards, stowage shelves, steel shelves

- * Workshops:
 - Experiment tables, and demonstration workbenches
 - Students' chairs and closets
 - Blackboards, bulletin boards, stowage shelves, steel shelves

A characteristic of the Project is that the facilities for 72 schools should be constructed, during a short period of time, although they are scattered widely throughout the Bicol Region. Thus, it will be necessary to establish construction schedule and management plan accordingly.

Since the prefabrication materials that are essential for attaining typhoon resistance are not available in the Philippines, it was planned to procure them in Japan. However, it was decided to procure other construction materials and education equipment in the Philippines to allow for easy maintenance and management of the completed Project facilities. It was planned to select whole construction materials and education equipment by giving the first priority to the easy maintenance and after service concept, i.e., maintenance free facilities.

Facility construction and education equipment procurement costs to be borne by the Japanese side was estimated as 2.57 billion yen. 14 months is required as a construction period.

The budget necessary for the educational activities in the Bicol Region is distributed by the Department of Public Money. In addition to the budgets, the Office of the Ministry of Education, the Textbook Board Secretariat, and the Population Education Program provide funds. Since the primary objective of the Project is to rebuild typhoon damaged school facilities, it will be possible to maintain and manage the completed Project facilities with the Bicol Region's present staff and conventional budget.

The Government of the Philippines has been making every effort to promote the education and manpower development program and to improve the educational situations. However, primary and secondary school facilities are in shortage, so that a great number of children cannot receive education. In addition to these adverse situations, the classroom shortage has become more serious due to the damages caused by typhoons in 1986 and 1987. Therefore, it can be evaluated that the construction of the school facilities under the Project will greatly contribute to improve the present classroom shortage problems.

The implementation of the Project have the following effects:

(1) Increase the Opportunities of Children in Schooling

This new Project of building school facilities will accommodate 9,480 students in the 237 classrooms (average 40 students per classroom). After the completion of the facilities of the five-year schoolbuilding construction by the Project, 47,400 students will be accommodated. Thus, the implementation of the Project will contribute greatly to increase children's opportunity in schooling.

(2) Continuation of Stable Education

With this project, it will be possible to provide stable education without being interrupted by natural disasters, such as typhoons.

(3) Activation of Rural Economies

The construction of many schoolbuildings in the rural areas of the Philippines will provide employment opportunities to the rural residents. The procurement of construction materials and education equipment will stimulate the rural economies.

(4) Improvement of the Country's Manpower and Economy

The provision of equal educational opportunities to many Filipino children will result in the development of the country's manpower, and, as a consequence, it will contribute to the improvement of the country's economy.

(5) Contribution to Area Residents

The new schoolbuildings will be used, in addition to regular class use, for places of refuge for the school areas' residents during periods of natural calamity such as typhoons, etc. They will also be used as residents' meeting places. Thus, the Project will contribute greatly to the residents' social activities.

In view of the points outlined above, it is deemed to be appropriate and extremely worthwhile to carry out the Project with a grant aid from the government of Japan.

The Government of the Philippines has proposed providing equal educational opportunities to many of its people. The Government's proposal will be realized only by accomplishing the entire five-year Project that is divided into the five phases, with its Phase I in Bicol Region. Therefore, it is highly desired that the Government of Japan will continue its cooperation for the accomplishment of the Project throughout its five phases.

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CHAPTER 1 INTRODUCTION

CHAPTER 1. INTRODUCTION

The Government of the Philippines established the Medium-term Philippine Development Plan (1987-1992) to improve the country's economic situation in order to upgrade the living conditions of the people and to maintain economic and social growth.

The Plan also calls for heightening the country's industrial competitiveness and improving the country's trade balance by stabilizing consumer prices, increasing individual incomes, minimizing regional income differences, and increasing employment opportunities. The final objectives of the Plan are to reduce the number of the people in the low income bracket and to raise the standards of living.

The population in the Philippines has been increasing at an annual rate of 2.2%. Based on this fact, about 5,000 new classrooms are needed every year. About 3.4 million children were unable to attend school in 1985. At the same time many schoolbuildings throughout the country were either totally or partially destroyed by typhoons that devastated the land in 1986 and 1987. Thus, the Philippine Government, although with a tight budget, has the necessity of repairing a number of schoolbuildings in a short period of time.

The Government launched its five-year plan for constructing typhoon-resistant prefabricated schoolbuildings for the 360 schools, severely damaged, throughout the country.

The Government selected 72 schools in the Bicol Region for its first stage project and requested a grant aid to the Government of Japan. In response to the request, the Japan International Cooperation Agency (hereinafter referred to as "JICA") sent to the Philippines the Basic Design Study Team headed by Mr. Juro Chikaraishi of the Second Basic Design Study Division, Grant Aid Planning and Survey Department, JICA from 15 June to 4 July 1988. (Refer to the appendices 1, 2 regarding the members of the Study team and its Itinerary.)

From the field surveys and the data analyses made in Japan, the following items were confirmed:

- 1) The Project is a part of the Philippine Government's five-year School Building Program. The School Building Program consists of 40% of the schoolbuildings to be constructed by the Japanese Government. The rest will be financed by the Asian Development Fund from the Asian Development Bank and the Economic Support Fund from the United States Agency for International Development. The Philippine Government's own budget will also be allocated to some part.
- 2) In the Philippines the chronic shortage in number of classroom and the damages caused to the school facilities by the typhoons in 1986 and in 1987 are serious problems. Beginning with the 72 schools in the Bicol Region, the construction of schoolbuildings for 360 schools with grant aid during a five-year period is an extremely urgent subject for the Philippine Government.

In view of the above background, the construction of primary and secondary schoolbuildings under the Project will contribute greatly to improve the educational environment and to substantiate manpower development in the Philippines. It will be well worthwhile for the Government of Japan to provide a grant aid for the Project.

Judging from the results of the basic design study, the study team set up the optimum Project scale and design criteria and made the basic design of the Project. As the result, the Basic Design Study Report on the Project for Constructing Primary and Secondary Schoolbuildings has been prepared.

CHAPTER 2 BACKGROUND OF THE PROJECT

CHAPTER 2. BACKGROUND OF THE PROJECT

2-1 National Education and Manpower Development Plan

DECS launched the Five Year Development Plan (1983-1987) and strived to provide equal educational opportunities to children by increasing the number of barangay high schools and colleges and by increasing the amount of budget for student scholarships. As a result, the number of students increased from 13.2 million in 1983 to 14.4 million in 1986. However, the total school enrolment ratio during the same period decreased from 63.8% to 62.5%. Although the educational expenditure per one public primary school student was 229 pesos in 1983, in 1985 it was 197 pesos. For national high schools, the expenditure decreased from 201 pesos to 141 pesos during the same years.

Because of financial difficulties, the number of private colleges and universities decreased from 838 in 1983 to 816 in 1985. Based on recent survey, 3.4 million school-age children were not attending school in 1985. Also, due to low salaries and poor fringe benefits, the number of teachers of high quality is very small.

In light of the above background, the Government of the Philippines established the Education and Manpower Development Plan as a part of the Medium-Term Philippine Development Plan (1987-1992) in order to improve the educational situations. The objectives of the plan are to upgrade the quality of education and training, to cultivate men of talent to meet economic demands, to promote science and technologies, and cultural activities and sports, to improve the quality of teachers, and to strengthen management structures.

2-1-1 Objectives of the National Education and Manpower Development Plan

The final objectives of the plan are developing the potentiality of individual Filipinos and increasing the individual productivity, and, as a consequence, improving each household's livelihood and social conditions.

The concrete objectives of the plan are as follows:

- A) To improve the quality and increase the relevance of education and training
- B) To increase access of disadvantaged groups in all educational areas
- C) To accelerate the development of middle- and high-level manpower toward economic recovery and sustainable growth, as well as to enhance their employability, productivity and self-reliance
- D) To inculcate values needed in social transformation and renewal
- E) To preserve, enrich and propagate the nation's desirable cultural heritage and legacy
- F) To raise the level of awareness, interest and participation in sports and cultural activities
- G) To maintain an educational system that is truly Filipino in orientation, open to constructive ideas from everywhere, but alert to influences inimical to national dignity

2-1-2 Achievement Target

To accomplish the objectives of the National Education and Manpower Development Plan, DECS set up achievement targets for improving the educational indicators by 1992 (see Table 2-1).

Table 2-1 Education and Human Resources Development Targets, 1987-1992

Items	Target year							Average 1987-92
	1986	1987	1988	1989	1990	1991	1992	
A. Number of Students (thousand)								
Total	14,378	14,899	15,320	15,750	16,185	16,621	17,053	15,971
1. Primary Education	9,354	9,633	9,795	9,950	10,094	10,221	10,331	10,004
2. Secondary Education	3,574	3,713	3,864	4,029	4,208	4,339	4,600	4,126
3. High School Education	1,450	1,554	1,661	1,771	1,884	2,000	2,122	1,832
B. Teacher and Student Ratio								
1. Primary Education	32	34	36	37	38	39	40	—
2. Secondary Education	36	37	38	38	39	40	40	—
3. Tech/Vocational Education	35	35	30	28	25	23	20	—
C. Textbook and Student Ratio								
1. Primary Education	3	2	2	2	2	2	2	—
2. Secondary Education	3.5	3.5	3.5	1	1	1	1	—
3. Tech/Vocational Education	9	7	6	5	4	3	2	—
D. Classroom and Student Ratio								
1. Primary Education	36	38	38	38	39	39	40	—
2. Secondary Education	38	40	40	40	41	41	42	—
3. Tech/Vocational Education								
a. Lecture Rooms	10	12	15	18	20	23	25	—
b. Laboratory	8	8	10	12	12	14	16	—
E. Class and Classrooms								
1. Primary Education								
a. Regular Classrooms	1	1	1	1	1	1	1	—
2. Secondary Education								
a. Regular Classrooms	1.5	1.5	1.5	1.5	1.5	1.5	1.5	—
b. Science Classroom	8	8	8	8	8	8	8	—
c. Art Classrooms	One classroom per school							
d. Home Economic Classrooms	DITTO							
3. Tech/Vocational Education	3	3	3	2	2	2	2	—
F. Teachers' Training								
1. Primary Education	Gr. IV	Gr. V	Gr. VI	All grades				
2. Secondary Education	720 Teachers/889 Supervisors							
3. Tech/Vocational Education	2	2	4	4	4	4	4	—
G. School Facilities								
1. Primary Schools								
a. New Construction	5,502	5,277	5,828	5,884	6,420	6,542	7,889	6,307
b. Rebuilding	2,415	3,449	3,346	6,484	4,985	5,090	5,199	4,759
c. Repair	6,440	7,801	13,199	7,316	9,980	10,183	10,397	9,813
d. Multipurpose Room Const	189	532	661	539	673	598	695	616
2. Secondary Schools								
a. Schoolbuilding Const	315	117	129	135	140	139	144	134
b. Rebuilding	—	32	35	36	37	38	40	33
c. Repair	—	147	158	162	171	177	184	167
3. Tech/Vocational Schools								
a. Construction Material								
a. 1 Light weight	10	10	8	8	8	8	8	—
a. 2 Medium weight	35	35	30	20	15	10	5	—
a. 3 Heavy weight	35	30	20	15	10	8	6	—
b. Library								
b. 1 General Education	1	5	15	20	30	40	48	26
b. 2 Science & Special Fields	2	10	30	45	60	75	96	53
c. Schoolbuildings	100	150	250	330	330	330	330	287
H. Financial Aid to Students								
1. Secondary Education	All children of barangay officials and Selected children from ethnic groups under Selected Ethnic Groups Education Assistance Program							
2. Tech/Vocational Education (Scholarship/Tuition Waiver)	7	7	10	10	12	12	15	11
3. High School Education								
a. Scholarships	1,574	1,574	1,600	1,600	1,700	1,700	1,700	1,646
b. Tuition Waivers	8,350	8,350	8,500	8,500	8,700	8,700	8,700	8,575
c. Loans	3,000	3,000	3,000	5,000	5,000	5,000	5,000	4,333

2-1-3 Policies and Strategies

The Government of the Philippines established the following policies for the efficient and effective implementation of the National Education and Manpower Development Plan:

- 1) Improvement of the quality and relevance of education and training with respect to Philippine conditions and needs
- 2) Equitable access to education and training opportunities
- 3) Intensification of values education
- 4) Promotion of entrepreneurial education and training
- 5) Increased emphasis on science education, indigenous research, and experimentation
- 6) Full mobilization and utilization of education personnel with an increasingly commensurate system of compensation and incentives
- 7) Equitable allocation, efficient management and effective utilization of financial resources
- 8) Institutionalization of functional linkages and collaboration between formal and nonformal education and training institutions
- 9) Strengthening the system of educational and manpower development planning, implementation, monitoring and evaluation
- 10) Maximizing Philippine involvement in the International mainstream of education and Manpower Development

2-2 Education Situations in the Philippines

2-2-1 History of Modern Education System

The modern education system in the Philippines started with the founding of a college by Catholics. This was during the time when the country was under Spanish rule (1565-1898). The San Jose College was founded in 1601. Later, it merged with the Saint Thomas College that was established in 1611. Saint Thomas college became a university in 1871, and it is one of the oldest universities in Asia.

At the end of the Spanish rule, compulsory primary education started. During American rule (1898-1946), education and religion were separated and the public education system was established. After gaining its independence in 1946, the Government of the Philippines promoted a community school system and tried to restore the primary education system in order to reconstruct the impoverished social conditions, such as destroyed school facilities that were created under Japanese militarism.

After the independence, the Government of the Philippines launched educational policies that emphasized nationalism for the purpose of eradicating the evils of past colonialism. The Philippinization of education was promoted.

The Government introduced social studies into the first grade of primary schools to teach the children Filipino culture. It also introduced flag raising and the National Calendar into the education program in order to raise patriotism.

Because of the Government's great efforts in developing the education system, the Philippines became one of the leading countries in Asia that accomplished improvement in education in a short period of time.

2-2-2 Present Education Situations in the Philippines

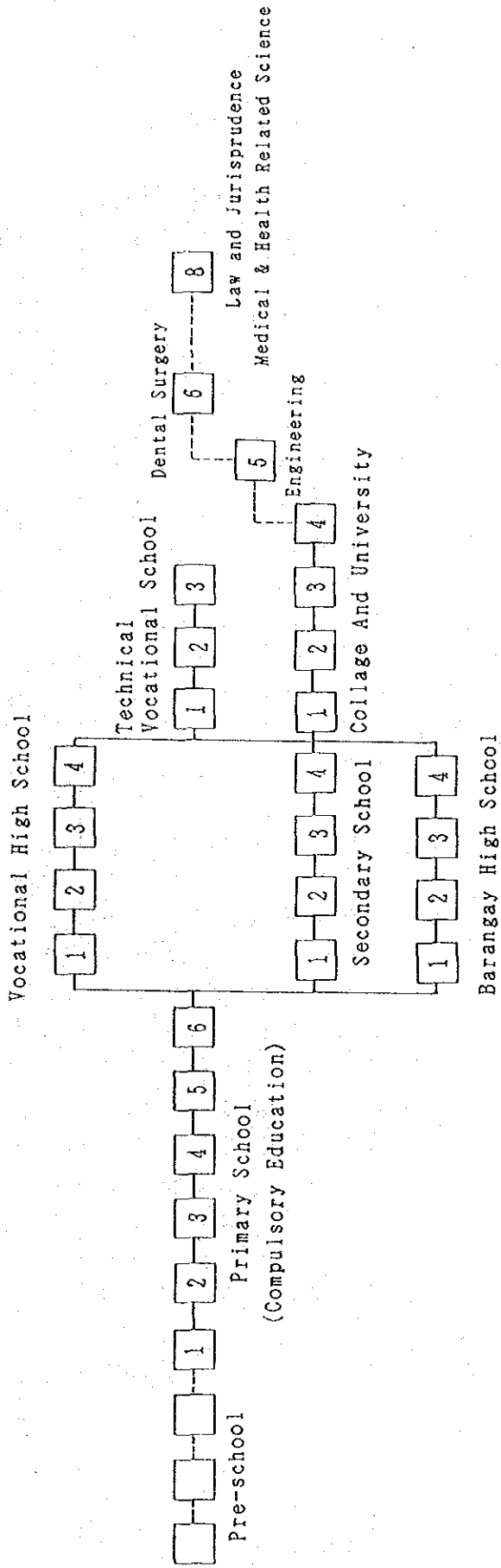
The education system in the Philippines has been greatly influenced by Spanish and American systems. After gaining its independence from the United States in 1946, the Philippines has still followed the American education system. Even now, one of the country's official languages is English.

The major education systems introduced by the United States were the seven-four-four year (seven years of primary education, four years of secondary education, and four years of high school education) education system, free primary education, diffusion of mass education, establishment of pilot schools, and the co-education system.

Except for some private schools, the primary education system was revised to a six-year school system from original seven-year system due to the budgetary difficulties. Presently, the country is conducting the six-year primary, four-year secondary, and university education system. In order to enter a university, a secondary school student must pass the entrance examination held by the National Testing and Research Center of DECS.

The education system in the Philippines is shown in Table 2-2. The education performance indicators are listed in Table 2-3.

Table 2-2 The Educational System in the Philippines



	Pre-school Education			Primary Education						Secondary Education						Higher Education						
Age	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Grade				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	

Table 2-3 Education Performance Indicators, 1984-1988 (Target)

Region	Participation Rate				Dropout Rate				Cohort Survival Rate						
	1984	1985	1986	1987	1988	1984	1985	1986	1987	1988	1984	1985	1986	1987	1988
NCR	36.85	37.53	38.21	38.89	39.57	4.73	4.46	4.19	3.92	3.65	34.78	35.52	36.26	37.00	37.47
Region I	54.84	55.85	56.86	57.58	58.88	3.88	3.66	3.44	3.22	3.00	47.28	48.29	49.30	50.21	51.32
Region II	22.54	22.96	23.38	23.80	24.22	5.09	4.80	4.51	4.22	3.93	32.08	32.76	33.44	34.12	34.80
Region III	25.07	25.53	25.99	26.45	26.91	5.43	5.12	4.81	4.50	4.19	33.06	33.76	34.46	35.16	35.86
Region IV	27.85	28.36	28.87	29.38	29.89	5.67	5.35	5.03	4.71	4.39	43.21	44.13	45.05	45.97	46.89
Region V	25.72	26.20	26.68	27.16	27.64	8.37	7.89	7.41	6.93	6.45	39.21	40.05	40.89	41.73	42.57
Region VI	35.04	35.69	36.32	36.99	37.64	5.98	5.64	5.30	4.96	4.62	61.16	62.46	63.76	65.06	66.36
Region VII	17.75	18.08	18.41	18.74	19.07	6.62	6.24	5.16	5.48	5.10	34.27	35.07	35.73	36.46	37.19
Region VIII	28.83	28.90	29.24	29.94	30.46	3.78	3.56	3.34	3.12	2.90	47.23	48.24	49.25	50.26	51.37
Region IX	10.48	10.67	10.86	11.05	11.24	6.91	6.52	6.13	5.74	5.35	48.52	49.66	50.70	51.74	52.78
Region X	20.83	21.21	21.59	21.97	22.35	6.05	5.70	5.35	5.00	4.65	39.87	40.72	41.57	42.42	43.27
Region XI	23.23	23.66	24.09	24.52	24.95	6.50	6.13	5.76	5.39	5.02	40.23	41.09	41.95	42.81	43.67
Region XII	23.60	24.06	24.48	24.92	25.36	8.51	8.02	7.53	7.04	6.55	39.05	39.88	40.71	41.54	42.37
Average	28.14	28.66	29.18	29.70	30.22	5.97	5.62	5.28	4.94	4.60	41.28	42.16	43.05	43.92	44.80

1) School facilities

In 1985, there were 33,156 public and private primary schools -- 31,817 were public and 1,339 were private schools. The number of public and private secondary schools were 5,375 - 3,357 public and 2,018 private schools -- in the same year. Table 2-4 shows number of pre-schools and primary and secondary schools in 1985.

Table 2-4 Number of Pre-schools and Primary and Secondary Schools.
(School Year 1985)

Region	Pre-schools			Primary Schools			Secondary Schools		
	Total	Public	Private	Total	Public	Private	Total	Public	Private
TOTAL	2,254	1,257	797	33,156	31,517	1,339	5,375	3,357	2,018
NCR	544	202	342	597	442	255	340	119	221
Region I	188	127	61	2,934	2,633	101	633	422	211
Region II	0	0	0	2,199	2,147	52	270	156	114
Region III	206	91	115	2,507	2,371	136	456	260	196
Region IV	412	215	196	3,948	3,740	208	755	474	281
Region V	82	51	31	2,884	2,805	79	427	287	140
Region VI	338	260	75	3,316	3,121	195	531	382	149
Region VII	88	46	42	2,597	2,543	57	364	197	167
Region VIII	75	63	12	3,209	3,183	26	363	289	74
Region IX	40	22	18	2,216	2,181	35	241	173	68
Region X	74	20	54	2,369	2,305	64	378	226	152
Region XI	42	1	41	2,236	2,146	90	357	202	155
Region XII	155	155	10	2,044	2,000	44	260	170	90

2) Number of Student

The total number of primary school students in 1984 was approximately 8.79 million. 8.27 million were public school students; the remaining 520,000 were private. Due to the country's 2.2% annual population increase, the number of primary school students is estimated to become 10.33 million by 1992.

The total number of secondary school students in 1984 was about 3.32 million. 1.94 million were public school students, and 1.36 million were private. The number of primary and secondary school students are shown in Table 2-5.

Table 2-5 Number of Primary and Secondary School Students
(School Year 1984)

Region	Primary Schools			Secondary Schools		
	Public	Private	Total	Public	Private	Total
NCR	693,134	191,641	884,175	262,567	203,768	468,335
Region I	595,947	31,902	628,849	193,342	113,154	306,526
Region II	393,843	2,287	403,135	31,290	61,000	143,290
Region III	821,616	58,070	879,588	166,542	208,969	375,511
Region IV	1,094,915	89,435	1,183,800	244,215	236,678	480,893
Region V	668,443	14,848	683,291	144,842	60,956	205,828
Region VI	340,556	25,488	555,384	249,654	78,444	328,100
Region VII	613,038	23,549	641,584	96,024	116,249	212,317
Region VIII	562,669	5,760	508,429	113,100	38,190	151,290
Region IX	446,950	9,138	456,088	80,704	41,103	121,807
Region X	513,714	16,911	530,625	99,165	71,795	170,960
Region XI	512,503	32,763	645,266	121,490	84,711	206,201
Region XII	472,252	10,706	482,958	102,507	50,498	153,005
T O T A L	8,264,825	523,948	8,793,773	1,957,444	1,365,519	3,323,063

3) Number of Teachers

The total number of primary school teachers in 1987 was approximately 280,000. About 270,000 were public school teachers and about 10,000 were private. The total number of secondary school teachers was about 90,000 in 1987. Approximately 50,000 of them were public school teachers and about 40,000 were private. The number of primary and secondary school teachers are shown in Table 2-6, and the teacher-student ratio in public schools are shown in Table 2-7.

Table 2-6 Number of Primary and Secondary School Teachers

School Year	Primary Schools		Secondary Schools	
	Public	Private	Public	Private
1974 - 1975	278,435	N/A*	27,346	N/A*
1975 - 1976	252,489	N/A	33,183	N/A
1976 - 1977	255,746	N/A	38,296	N/A
1977 - 1978	258,947	N/A	44,613	N/A
1978 - 1979	254,690	N/A	50,946	N/A
1979 - 1980	253,911	N/A	48,283	N/A
1980 - 1981	255,343	N/A	52,435	N/A
1981 - 1982	261,131	N/A	54,555	N/A
1982 - 1983	261,860	N/A	56,257	N/A
1983 - 1984	270,493	10,963	69,563	34,614
1986 - 1987	273,170	12,175	49,263	36,324

*N/A: Data not available

Table 2-7 Teacher-Student Ratio in Public Primary Schools

School Year	Number of Students	Number of Teachers	Teacher-Student Ratio
1974 - 1975	7,043,522	284,436	1:23
1975 - 1976	7,197,878	246,569	1:29
1976 - 1977	7,387,178	234,946	1:31
1977 - 1978	7,424,254	258,947	1:29
1978 - 1979	7,780,313	254,690	1:31
1979 - 1980	7,817,450	253,911	1:31
1980 - 1981	7,931,154	255,343	1:31
1981 - 1982	8,073,290	261,131	1:31
1982 - 1983	8,184,061	261,860	1:31
1983 - 1984	8,210,570	270,493	1:30
1984 - 1985	8,998,640	273,170	1:30

In 1984, there were 1,150 colleges and universities in the Philippines. 300 of them have teacher training courses. In 1984, about 15,000 students graduated from teacher training courses. To obtain teaching credentials, students must pass the Board Examination for Teachers after graduation. The teachers' position classification system in the Philippines is similar to the one used in Japan. Ranking is from principle, to vice principle, to teacher. In most of the secondary schools, there are department heads under the principles.

Table 2-8 shows the required courses and the number of credits needed to become a teacher.

Table 2-8 Required courses for Teacher Credentials

Required Courses	Primary School Teacher	Secondary School Teacher
• General Education Courses	102 Units	93 Units
• Major Courses	36 Units	30 Units
• Optional Courses	0	0
• Special Courses		
• Major	18	24
• Minor	0	0
Total	156 Units	156 Units

2-2-3 Contents of Education in the Philippines

The uniqueness of the education in the Philippines is the variety of languages. Presently, the primary education is carried out in three languages -- English and Tagalog as the official languages and each local language. The languages used in primary schools are shown in Table 2-9.

Table 2-9 Languages used in Class and Language Education for Each Grade of Primary School

<u>Languages used in class</u>	<u>Language Education</u>
6th Grade: English and Tagalog (Supplement)	English and Tagalog
5th Grade: English and Tagalog (Supplement)	English and tagalog
4th Grade: English and Local Language(Supplement)	English and Tagalog
3rd Grade: English and Local Language(Supplement)	English and Tagalog
2nd Grade: English and Local Language	English and Tagalog
1st Grade: English and Local Language	English and Tagalog

1) Primary Education Curriculum

The new primary education curriculum was introduced in 1985. Compared to the previous one, the new curriculum emphasizes the development of basic reading, writing and calculation skills and development of pride as Filipinos. Table 2-10 shows the primary education curriculum. From the table, the strong influence of the recent American education trend can be observed.

The characteristics of the curriculum are as follows:

- a) To teach the importance of public health even outside of classes of "Character Building Activities" and "Science and Health"
- b) Introduction of the subjects that will be helpful for social life
- c) Development of basic reading, writing, and calculating skills, pride as Filipinos, and the manpower that will be useful in the future development of the country

Many primary schools have a double-shift class system of morning and afternoon classes. Some schools that were damaged by typhoons have a three-shift class system.

Table 2-10 New Primary Education Curriculum (unit:minutes / day)

Subject \ Grade	1	2	3	4	5	6
Character Building Activity	20-30	20-30	20	20	20	20
Pilipino	60	60	60	60	60	60
English	60	60	60	60	60	60
Math.	40	40	40	40	40	40
Civics and Culture	40	40				
History/ Geography/ Work ethics			40			
History/ Geography/ Civics				40	40	40
Science and Health			40	40	40	40
Art and P.E.			40	40	40	40
H.E. and Livelihood Educ.				40	60	60
Total	220-230	220-230	300	340	360	360

2) Secondary Education Curriculum

Secondary education is conducted on a bilingual basis, using both English and Tagalog. The term of the secondary education is four years. This is two years shorter than the Japanese school term.

Secondary education is very rich in content; its level is high as the curriculum equivalent to Japanese six years course is taught during four years. The secondary school curriculum is shown in Table 2-11. The characteristic of the curriculum is the adoption of the Youth Development Training (YDT) from the first year to the third year period. YDT continues in the "Art and Physical education" class in the fourth year.

Table 2-11 Secondary School Curriculum

Subject	1st Year		2nd Year		3rd Year		4th Year	
	Unit	Min/wk	Unit	Min/wk	Unit	Min/wk	Unit	Min/wk
Communication Art (English)	2	300	1	180	1	180	1	180
Communication Art (Tagalog)	1	180	1	180	1	180	1	180
Social Studies	1	180	1	180	1	180	1	180
Science	1	180	1	180	1	180	1	180
Math.	1	180	1	180	1	180	1	180
Prac. Arts/ Vocational Course	1	300	1	300	2	300	1	300
Electives: General Course, Vocational Course			1	180	2	360	2	360
YDT(Grade I-III)	1	300	1	300	1	300		600
Civil Army Training							1	300
Subtotal				1,680		1,980		1,980
TOTAL	8	1,620	8	1,800	10	2,220	10	2,220

3) Contents of Textbooks

The textbooks used in the Philippines were greatly influenced by the ones used in the United States and Europe; they are rich in content. Since the history of textbook development in the Philippines is short, some textbooks are not appropriate to the present Philippine situations. Since 1980, an emphasis was put on providing education in the country's own language as well as on increasing hours of the country's history and social studies in order to develop the individual's identity as a Filipino.

Textbooks made by the Government are provided to the students free of charge. On an average, one textbook is used by two primary school students and by three and half secondary school students.

2-2-4 Educational Budget and Expenditures in the Philippines

The 1985 educational budget was about 6.1 billion pesos. This was 500 million pesos more than that for the previous year (1984) -- in that year it was about 5.6 billion pesos. From these figures, it can be understood how strongly the Government of the Philippines has been endeavoring to promote the country's educational policies. The items and amounts of DECS's 1985 educational expenditures are shown in Table 2-12. The percentage of educational expenditures among the Government's total expenditures from 1970 through 1985 is shown in Table 2-13.

Table 2-12 Breakdown of DECS's Expenditures in 1985

(Unit: Thousand Pesos)

Current Operating Expenditures	
Office of the Minister	5,826,198
Bureau of Elementary Education	3,001
Bureau of Secondary Education	2,360
Bureau of Higher Education	2,550
Bureau of Sports Development	797
Bureau of Technical & Vocational Education	829
Bureau of Continuing Education	1,625
Institute of National Language	4,586
National Historical Institute	6,590
National Library	8,357
National Museum	13,046
SUBTOTAL	5,869,942
Capital outlays	
Office of the Ministry	268,686
National Historical Institute	4,958
National Library	90
National Museum	1,480
Institute of National Language	0
Total Capital Outlays	276,965
Total New Appropriation, Ministry of Education, Culture and Sports	6,145,907

Table 2-13 Percentage of Educational Expenditures (DECS) among the Government Total Expenditures (Unit: Billion Pesos)

Year	National Government	DECS	Percentage (%)
1970	3.20	0.85	25.96
1971	3.72	1.01	27.78
1972	5.57	1.25	22.40
1973	7.94	1.29	16.30
1974	13.02	1.49	11.30
1975	18.93	1.78	9.40
1976	23.19	1.84	8.00
1977	27.39	2.04	7.40
1978	28.68	3.20	11.16
1979	32.23	3.45	10.70
1980	37.87	3.41	9.01
1981	50.32	3.83	7.61
1982	57.09	4.39	7.69
1983	61.84	3.47	8.85
1984	53.45	5.61	10.30
1985	58.33	6.14	10.45

2-2-5 Educational Problems in the Philippines

The followings are the educational problems in the Philippines:

1) Chronic Shortage of School Facilities

Presently, more than 6,000 new classrooms are in immediate need. In order to meet the needs of the increasing number of students caused by an annual population growth rate of 2.2%, additional 5,000 classrooms must be built. Furthermore, natural calamities such as typhoons inflict damages upon school facilities every year. As a result, the Government of the Philippines is facing a serious problem of classroom shortage.

2) Shortage of Textbooks and Other Teaching Materials

One textbook is supposed to be provided to an average of two primary school students. In reality, however, due to the insufficient budget and the transportation system, textbooks are not being delivered at the above rate to the remote areas of the Philippine archipelago that consists of some 7,000 islands. Most schools, except for some private ones, do not have necessary education equipment for Educational TV programs and the audio-visual education system which started only recently.

3) High Dropout Rate

The school dropout rate is very high in the Philippines. In 1983, 2.7% (220,000 students) of the total 8.21 million students stopped attending schools. The major reasons for the high dropout rate are the lack of parents' understanding for education and household poverty, and children as being precious labor.

4) Heavy Burden of Language Study

Education in the Philippines is conducted in three languages, the two official languages (English and Tagalog) and one local language. Language studies are heavy burden on the students and it causes one of the reasons of the school dropout.

2-3 Primary and Secondary School Construction Plan

The Philippine Government set a target for constructing 40,252 primary and secondary classrooms, 3,598 multi-purpose facilities, 1,608 workshops, and 804 science laboratories, rebuilding 28,553 classrooms, and repairing 58,876 classrooms by the year 1992. It was planned to give priority to those primary schools having class to classroom ratios of more than 2 to 1, and to those secondary schools lacking more than 12 classrooms per school.

1) School Building Program for Public Primary Schools

The Public Elementary School Building Program addresses itself to the need of 32,037 schools. Presently, there are 222,312 public primary school classrooms and 8.64 million students. In the Philippines, the standard number of students per class is 40. However, many schools have more students than the standard. To solve this problem, it is necessary to build 6,000 classrooms.

The number of students has been increasing in proportion to the annual 2.2% of the country's population increase. To meet this increase, it will be necessary to construct 5,000 additional classrooms each year. Furthermore, there is a need to rebuild 8,400 and repair another 21,000 that were damaged by natural disasters such as typhoon. Table 2-14 provides School Building Program for primary schools.

2) School Building Program for Public Secondary Schools

So far, only national secondary schools had been included in the construction plan. With the introduction of the Free Public Secondary Education Program from June 1988, however, other public secondary schools will be incorporated in the national secondary school system. As many of the barangay high schools are sharing classrooms with public schools, there is a need for them to acquire new school sites where new schoolbuildings will be built.

There are presently 5,394 secondary schools. 2,067 of them are private schools and 3,327 are public schools. 716 of the public schools are national. The rest, 2,611, are supported by local governments.

During the 1987-88 school year there were approximately 2.02 million public secondary school students -- 820,000 attend national schools; the rest, 1,200,000 attend local government schools. It is estimated that the number of secondary school students will increase 4.34% annually. Due to the introduction of new curriculum, there is a requirement for constructing new science laboratories and workshop.

Table 2-14 1989 Primary School Buildings Construction Program (Amount in Thousand Pesos)

Province/City	Regular Classrooms						Multipurpose Workshops						Toilets		Total	
	Additional		Replacement		Rehabilitation		Additional		Rehabilitation		New Construction		Numbers	Costs	Numbers	Costs
	Numbers	Costs	Numbers	Costs	Numbers	Costs	Numbers	Costs	Numbers	Costs	Numbers	Costs				
1. NCR	694	119,368	135	20,250	542	23,848	37	9,250	81	3,402	525	18,375	2,014	194,493		
2. Region I	209	20,900	48	3,350	354	7,080	10	1,400	47	1,974	34	1,190	702	35,904		
3. Region II	271	27,100	39	2,730	286	5,720	14	1,960	38	1,596	27	945	675	40,051		
4. CAR	85	8,500	27	1,890	197	3,940	6	840	26	1,092	14	490	355	16,752		
5. Region III	261	26,100	63	4,410	463	9,260	14	1,960	62	2,604	35	1,225	898	45,559		
6. Region IV-A	211	21,100	66	4,620	488	9,760	10	1,400	55	2,730	49	1,715	889	41,325		
7. Region IV-B	135	13,500	51	3,570	377	7,540	9	1,260	54	2,268	33	1,155	659	29,293		
8. Region V	458	45,800	78	5,460	574	11,480	24	3,360	74	3,108	32	1,120	1,240	70,328		
9. Region VI	804	80,400	75	5,250	553	11,060	42	5,880	71	2,982	46	1,610	1,591	107,182		
10. Region VII	648	64,800	74	5,180	545	10,920	35	4,900	70	2,940	40	1,400	1,413	90,140		
11. Region VIII	396	39,600	61	4,270	449	8,980	21	2,940	60	2,520	44	1,540	1,031	59,850		
12. Region IX	141	14,100	53	3,710	392	7,840	7	980	52	2,184	35	1,225	580	30,039		
13. Region X	290	29,000	58	4,060	424	8,480	15	2,100	56	2,352	31	1,085	874	47,007		
14. Region XI	369	36,900	63	4,410	463	9,260	20	2,800	61	2,562	35	1,225	1,011	57,157		
15. Region XII	207	20,700	46	3,220	340	6,800	11	1,540	45	1,890	20	700	669	34,650		
Total	5,179	567,868	937	76,390	6,448	141,968	275	42,570	862	36,204	1,000	35,000	14,701	900,000		

* CAR : CORDILLERA ADMINISTRATIVE REGION.

The objectives of the School Building Program for public secondary schools are

- 1) to construct new classrooms to meet the needs of the increasing number of students.
- 2) to rebuild or repair schoolbuildings that were either deteriorated or damaged by natural disasters.

Table 2-15 shows the target of the School Building Program for public secondary schools. Table 2-16 shows the estimated cost necessary for implementing the program.

As is described in the above, the School Building Program for primary and secondary schools -- to construct new classrooms to meet the increasing needs of the increasing number of students; to fulfill the requirements for the introduction of a new curriculum, and the Free Public Secondary Education Program; to rebuild and repair damaged or deteriorated buildings -- is a most important and urgent undertaking for the Philippine Government.

Table 2-15 School Building Program for Secondary Schools (1988-1992)

	1988*	1989	1990	1991	1992	Total
CLASSROOM						
For Backlogs		990	990	990	990	3,960
For Enrollment Increase	945	1,702	2,490	2,674	2,737	10,548
Replacement of Dilapidated		695	722	757	793	2,967
Repair/Completion	300	2,052	2,132	2,237	9,068	
SCIENCE LABORATORIES						
For Backlogs		812	812	812	812	3,248
For Enrollment Increase	236	426	623	669	689	2,643
Replacement of Dilapidated		91	116	145	174	526
Repair/Completion	200	298	336	379	423	1,636
WORKSHOPS						
For Backlogs		624	624	624	624	2,496
For Enrollment Increase	339	734	804	865	900	3,642
Replacement of Dilapidated		244	271	299	329	1,143
Repair/Completion	120	718	759	802	846	3,245

Notes: * Figures of 1988 are for nationally funded secondary schools only; the rest are for nationally and locally funded secondary schools.

• Provision of accommodations from other relevant program has been deducted from requirements for enrollment increase in all room categories.

Table 2-16 Investment Requirements for Public Secondary School Buildings,
1988 to 1992 (Amount in thousand Pesos)

	1988	1989	1990	1991	1992	TOTAL
CLASSROOMS						
For Backlogs		143,550	143,550	143,550	143,550	574,200
For Enrollment Increase	137,025	246,790	351,050	387,730	396,865	1,529,460
Replacement of Dilapidated		100,775	104,690	109,765	114,985	430,215
Repair/Completion	9,000	61,560	63,960	67,110	70,410	272,040
SCIENCE LABORATORIES						
For Backlogs		174,580	174,580	174,580	174,580	698,320
For Enrollment Increase	50,740	91,590	133,945	143,835	148,135	568,245
Replacement of Dilapidated		19,565	24,940	31,175	37,410	113,090
Repair/Completion	8,000	11,920	13,440	15,160	16,920	65,440
WORKSHOPS						
For Backlogs		152,880	152,880	152,880	152,880	611,520
For Enrollment Increase	83,055	180,075	196,980	211,925	220,500	892,535
Replacement of Dilapidated		59,780	66,395	73,255	80,605	280,035
Repair/Completion	5,400	32,310	34,155	36,090	38,070	146,025
TOTAL	293,220	1,275,375	1,470,565	1,547,055	1,594,910	6,181,125

2-4 Typhoon Damage to School Facilities

In 1987, while the Philippine Government was in the midst of the program to improve educational conditions, two large typhoons damaged the school facilities especially in the Bicol Region.

On the 8th of August, Typhoon Harming attacked the northern part of Samar Island and struck furiously on the cities of Sorsogon in the Bicol Region and Marinduque of the Tagalog Region. In Recon, the Recorded maximum wind speed was 240 km/hr; in Masbate it was 185 km/hr. The typhoon ravaged Samar Island, the Bicol Region, Romblon and Marinduque of the Tagalog Region, Mindoro Island, and Metro Manila. Damages to school facilities were estimated at approximately 110 million pesos.

The large-sized Typhoon Sisang hit the southern Bicol Region on November 23, 1987; it passed over the Tagalog Region and moved out into the South China Sea on November 27, 1987. The maximum wind speed of 240 km/hr was recorded in Legaspi City of the Bicol Region. Typhoon damage extended to Metro Manila, the Bicol Region, Southern Luzon, Leyte, Northern Samar, and to the Southern Tagalog Region. Estimated damages to school facilities amounted to approximately 200 million pesos.

The estimated amounts of typhoon damages to school facilities during the past five years are listed in Table 2-17. DPWH budgets allocated to damaged school facilities are shown in Table 2-18.

Table 2-17 DPWH Fund Allocation for Typhoon Damaged schoolbuildings
By Region and By year

(unit: thousand Peso)

Region	1987	1988
NCR	161,563	224,932
I	34,568	48,187
II	35,006	47,988
III	34,694	49,485
IV - A		75,009
	71,820	
IV - B		34,896
V	37,870	54,920
VI	50,491	68,461
VII	61,548	58,013
VIII	43,816	68,797
IX	42,437	37,517
X	52,639	53,907
XI	51,594	52,540
XII	43,919	41,348
Total	721,967	916,000

The Bicol region (Region V) was the area most severely damaged by the two major typhoons in 1987. At present -- nine months after the two typhoons -- the area has been partially restored; however, most of the damaged school facilities have been left without restoration.

In view of the above, DECS established new standard of building structure and intends to adopt them when they planned to construct new schoolbuildings. By adopting them it is anticipated that the new schoolbuildings will be able to withstand typhoons similar to those which devastated the area in 1987.

Table 2-18 Estimated Damages to Schoolbuildings by Typhoon, by year, and by Region (unit: peso)

Name of Typhoon	Marine	Nitang	Sisang	Herming	Trining	Nemeng	Pepang	Total
Edate	19 Aug. 1984	1 Sept. 1984	1987	13 Aug. 1987	1987	Sept. 1987	1987	
Region I	36,313,802						46,594,210	82,908,012
Region II	6,140,192		7,300,000			2,568,300	4,795,800	20,804,292
Region III	7,610,000							7,610,000
Region IX		1,775,000	28,235,874	83,110,955	1,759,417			114,881,246
Region X			160,333,593	26,057,522				186,391,115
Region XI		15,930,000						15,930,000
Region XII		88,610,358						88,610,358
Region VIII		21,060,000						21,060,000
Region IV								0
Region V	200,000	167,859,177						168,059,177
Region VI	250,000	4,526,000						4,776,000
Region VII								0
TOTAL	50,513,994	299,760,535	195,869,467	109,168,477	1,759,417	2,568,300	51,390,010	711,030,200

2-5 Foreign Aid

Damages to school facilities caused by the 1987 typhoons were estimated to be 360 million pesos. This was a great setback for the Government of the Philippines' School Building Program for public primary and secondary schools. For this reason the Government requested a grant aid for foreign countries to undertake a part of the construction plan. Thus, 40% of the plan will be covered by Japanese aid, the Asian Development Bank (ADB) and the United States Agency for International Development will finance part of the plan, and the rest will be undertaken by the Philippine Government at its own expense. Table 2-19 gives the newly nationalized public secondary schools to be financed by foreign aids.

Table 2-19 Newly Nationalized Public Secondary Schools
to be Financed by Foreign Aids (1989)

Country/Organization	Classrooms	Science Laboratories	Workshops
Japan	200	50	50
ADB	80	20	20
U. S. A.	48	12	-
Total	328	82	70

In addition to the Project, the Japanese Government provided grant aid such as the Youth Reeducation Plan (1986). The Philippine Government is highly appreciating the grant aid provided by the Japanese Government; the aid has contributed substantially to the improvement of education in the Philippines.

The DAC Group, an organization made up of members from eighteen developed countries, and five international organizations including ADB have been holding meetings every year since 1971 for the purpose of arranging and providing systematic aid to the Philippines. The United States spends 125 million dollars a year for its military bases in the Philippines. Also, the United States has provided 475 million dollars in grant aid for the development of the areas around their Philippine military bases. The United States' aid, based on the Military Base Treaty, totals approximately 900 million dollars. The amount of foreign aid offered to President C. Aquino in 1986 by the United States, Japan, the Asian Development Bank, the World Bank, etc. amounted to 1.4 billion dollars. At the Debtor Nations Conference held in Paris in January 1987, approximately 1.6 to 1.7 billion dollars in financial assistance was promised to the Philippines.

**CHAPTER 3 SITUATIONS AND PROBLEMS RELATED TO THE
PRIMARY AND SECONDARY EDUCATION
SYSTEM IN THE BICOL REGION**

CHAPTER 3. SITUATIONS AND PROBLEMS RELATED TO THE PRIMARY AND SECONDARY EDUCATIONAL SYSTEM IN THE BICOL REGION

Because of the serious damages on the Bicol Region by typhoons during 1987, it was selected as the first area of the Project. Situations and problems that are presently related to the primary and secondary educational system in the Bicol Region are outlined below:

3-1 Present Situations Relating to the Primary and Secondary Educational System in the Bicol Region

DECS Bicol regional office implemented the prioritized programs and project in line with the ministry's thrusts and the regional development goals for 1985 as follows:

- Education quality improvement
- Students' values development such as strengthening their decision-making skills and development of desirable personal and social habits and relationships
- Students' productivity development
- Equity, efficiency and effectiveness of education
- Physical fitness and sports development

1) Primary Education

The primary education system in the Bicol Region is divided into nine school divisions and 157 school districts. In 1987, there were 2,845 primary schools --2,766 were public schools and 79 private schools -- 21,906 teachers, 689,989 students, and 17,288 classrooms. There were 206 public and 61 private pre-schools.

The educational achievements made in 1985 are as follows:

1) Pupil Development/ Assistance Program:

- Implementation of the New Elementary School Curriculum (NESC) for Grade III in all the 2,208 elementary schools in the region
- Infusion/ integration of moral values, humanism, Filipinism and nationhood in the deferent learning areas from Grade I-VI
- Organization of remedial reading classes
- Improvement of pupils' health through the implementation of school nutrition and feeding program, medical services, etc.
- Cultural presentations, agricultural exhibits and musical and literary contests were conducted to enhance social development of pupils

2. Staff Development:

- Training of school personnel to insure effective implementation of the NESC in Grade III
- Availment of 31 slots in the DECS Integrated Scholarship Program allotted to the Bicol Region

3. Textbook Distribution Program:

- 154,367 textbooks were distributed to 2,740 elementary schools
- 4,360 Teachers Guides and 8,357 Teachers Manual were distributed

4. Curriculum and Instructional Materials Development:

- Enrichment of modules based on objectives in the Minimum Learning Competencies in Grade I-III
- Reproduction of low-cost instructional materials
- Construction and validation of test based on the Minimum Learning Competencies in Grade I and III
- Monitoring and supervising intensively elementary education instructions in Grade I-VI

5. Physical Facilities/ Equipment and School Building Program

- Construction of 331 classrooms and 15 multi-purpose buildings
- Repair/ Rehabilitation of 170 classrooms
- Distribution of classroom equipment/ furniture to recipient schools

6. Research/ Special Study

- Conducted the PRODED-funded research entitled "Intensive Reinforced Study Program"
- Won third place in the contents for research

Tables 3-1, 3-2, and 3-3 show the primary schools' education, the 1987 school construction plan, and the number of students during the past ten years in the Bicol Region.

Table 3-1 Performance Indicators (Primary Education)

a. Participation rate	87.38%
b. Cohort Survival Rate	64.42%
c. Transition Rate (Primary to Intermediate)	91.55%
d. Dropout rate	1.88%
e. Repetition Rate	2.36%
f. Teacher-Pupil Ratio	1 : 31
g. Class-Classroom Ratio	1 : 1
h. Achievement Rate	59.64%

Table 3-2 School Building Construction Plan

Calendar Year	New Construction		Repair	
	Number of Classrooms	Number of Buildings	Number of Classrooms	Number of Buildings
1984	511	275	136	109
1985	516	32	38	191
1986	389	N/A*	165	N/A*
1987	417	35	554	N/A*

* N/A: Data not available

Table 3-3 Number of Students in the Past 10 Years

School Year	Enrollment	Graduates
1977 - 1978	609,021	44,622
1978 - 1979	661,732	61,293
1979 - 1980	676,284	61,400
1980 - 1981	657,021	59,315
1981 - 1982	630,916	58,937
1982 - 1983	664,271	61,142
1983 - 1984	686,531	73,857
1984 - 1985	677,633	87,463
1985 - 1986	680,414	83,102
1986 - 1987	689,989	83,101

2) Secondary Education

In 1987, there were 426 secondary schools -- 283 were public schools and 143 were private schools. 48 of the public schools were managed by the Philippine Government; the other public schools were managed by local governments. There were 194,446 students -- 127,185 attended public schools; 67,261 went to private schools. There were 3,611 teachers -- 2,007 were employed by the Philippine Government; 1,604 by local governments.

The secondary school educational highlights of accomplishment achieved in 1985 are as follows:

1. Administration and analyses of the 1985 achievement tests
2. Master supervisory plan through the cluster of school divisions
3. Tryout of curriculum materials for the secondary education reform program (SERP)

The indexes of secondary school education activities during 1987 are shown in Table 3-4.

Table 3-4 Performance Indicators (Secondary Education)

a. Participation Rate	23.33%
b. Cohort Survival Rate	60.85%
c. Dropout Rate	5.31%
d. Repetition Rate	2.62%
e. Graduation Rate	91.52%
f. Teacher-Student Ratio	1 : 35
g. Transition Rate (6th Grade to 1st year High School)	47.71%
h. Retention Rate	83.36%
i. Completion Rate	55.69%

Furthermore, for continuing education in non-formal education, 2,337 classes were organized with 70,974 enrollees, 52,393 of whom graduated. Vocational/ Technical skills training topped the number of enrollees and graduates. Thirteen schools designated as regional centers of vocational excellence served as models and they also served as venues for in-service training for school administrators and teachers.

For curriculum development, the regional office produced booklets, comic magazines, non-book materials and script for radio broadcast as instructional materials for neo-literates. Also cultural development activities were undertaken such as collecting Bicol songs from different provinces and cities of the region, and participating in regional activities.

3-2 Bicol Region's Educational Budget and Expenditures

Out of the proposed budget of 525 million pesos only 430 million pesos was approved by the Office of the Budget and Management for the operation of elementary, secondary, and higher education and regional administrative and support service for 1985.

Other sources of fund released to the Bicol region were:

Office of DECS:	2,481,000 pesos
Textbook Board Secretariat:	1,304,000 pesos
Population Education Program:	98,000 pesos

For 1985, total disbursement amounted to 70 million pesos from the regular allotment; 16 million pesos from national aid; 46 million pesos from Population Education Fund; and 72 million pesos from other funds.

3-3 Problems Related to the Primary and Secondary Educational System in the Bicol Region

There are various educational problems in the Bicol Region. The major problems are as follows:

a. Primary Education:

- Inadequate buildings for vocational learning areas
- Lack of funds for repair and maintenance of buildings, school and office supplies and equipment, salary increases of personnel

b. Secondary Education:

- Many students do not possess adequate reading skills for successful studies due to lack of instructional and other reading materials and use of ineffective teaching methodologies
- Many students are still deficient in employable vocational skills due to lack of competent and qualified vocational teachers and provisions for on-the-job training
- Students generally have a low-level of comprehensive English
- Almost all barangay high schools do not have school sites and buildings

The Bicol Region was severely damaged by Typhoon Sisang in November 1987. Damages in the 3rd Political District were especially serious. 70% of Oas South Central School's and Oas Municipal Polytechnics High School's facilities were seriously damaged, and only partial restoration has been made up to present.

3-4 Background and Contents of the Request

1) Background of the Request

In order to provide equal educational opportunities to the people, the Government of the Philippines launched a program to build, by 1992, classrooms for 40,252 primary and secondary schools; to build 3,598 multi-purpose rooms, 1,608 workshops, and 804 science laboratories; to replace 28,553 dilapidated classrooms; to repair 58,876 classrooms.

The Government has been making every effort to complete the above mentioned school facilities, but in spite of their efforts they are confronted with the requirement of constructing and additional 15,000 new classrooms every year in order to meet the population increase. Some 3.4 million children were not attending school in 1985.

The powerful typhoons that either completely or partially destroyed many school facilities in the Bicol Region in 1986 and 1987 posed an additional burden on the Government: many schoolbuildings would have to be rebuilt or repaired in a short period of time.

Although the Philippine Government was in the midst of financial difficulties, it launched the Project to rebuild damaged schoolbuildings with typhoon-resistant structures in five years-- 360 schools were selected to undergo rebuilding with this method. For the first phase of the Project, the Government selected 72 schools in the Bicol Region that were most severely damaged by typhoons. And, for this purpose, the Government of the Philippines requested a grant aid to the Government of Japan.

2) Contents of the Original Request

The Government of the Philippines requested the construction of schoolbuildings (stressing the merits of the typhoon-resistant structure and taking into account the tropical climate) employing prefabricated unit construction methods.

The requested facilities for each school are as follows:

1. Schoolbuildings
 - 1) Primary School:
 - Classrooms (4 rooms)
 - Office (1 room)
 - Toilets (both male and female)
 - 2) Secondary School having Two buildings blocks:
 - A) Building 1:
 - Classrooms (4 rooms)
 - Science Laboratory
 - B) Building 2:
 - Office
 - Toilets (both male and female)
2. Equipment
 - All basic equipment necessary to operationalize the function of the schoolbuilding

The Project is the five year plan that will start in 1989 for constructing a total of 360 primary and secondary schools throughout the entire country. The project is divided into five phases; each phase is programmed to construct 72 schools. The construction schedule is shown in Table 3-5.

Table 3-5 Implementation Schedule of Originally Requested
Schoolbuilding construction Project

Phase	Period	Region	NO. of Units
Phase I	1989	V - Albay Sorsogon Camarines Sur Camarines Norte	22 Elementary Schools 50 Secondary Schools
Phase II	1990	VII - Northern Samar Eastern Samar Calbayog City Leyte IV - Marinduque Batangas Quezon Occ. Mindoro Or. Mindoro Romblon I - La Union II - Batanes Isabela	72 Secondary Schools
Phase III	1991	III - Nueva Ecija Tarlac Pampanga X - Surigao del Sur Surigao del Norte	72 Secondary Schools
Phase IV	1992	VI - Iloilo Aklan Capiz Antique	72 Secondary Schools
Phase V	1993	I - Benquet Abra Mt. Province II - Isabela/Cagayan	72 Secondary Schools

CHAPTER 4 THE CONTENTS OF THE PROJECT

CHAPTER 4. THE CONTENTS OF THE PROJECT

4-1 Objective of the Project

The original request by the Government of the Philippines calls for the construction -- using typhoon-resistant prefabricated structures -- of 360 primary and secondary schools throughout the country that were either totally or partially destroyed by typhoons in 1987. After the series of discussion, the objective of the Project is clarified and it is to construct 72 schools in the Bicol Region, ie., Region V, that are most urgently needed. This is the first phase of the Project.

4-2 Evaluation of the Project

The Government of the Philippines launched the Medium-term Philippine Development Plan (1988-1992). Every effort is being made to improve the country's educational situation. However, as is explained in chapter 2-2-5, due to the high population growth rate (2.2% annually), the number of school age children has increased rapidly. Thus, there is a requirement to construct 5,000 new classrooms yearly.

About 3.4 million children are not attending school in 1985. Further, many public primary and secondary schools were either totally or partially destroyed by typhoons in 1986 and 1987. For these reasons, the Project calls for the construction of the facilities and the accommodation for 72 public primary and secondary schools in the Bicol Region. To accomplish this task, the Philippine Government requested a grant aid for the Government of Japan.

Completing the construction of these educational facilities will significantly contribute to the country's education improvement program. With the additional facilities, the school attendance rate will be high, which, in the long run, will raise the educational level of the people and thereby contribute to the country's development. The construction of many new schoolbuildings in various parts of the country will provide rural people with employment opportunities and help to activate rural economies.

4-3 Outline of the Project

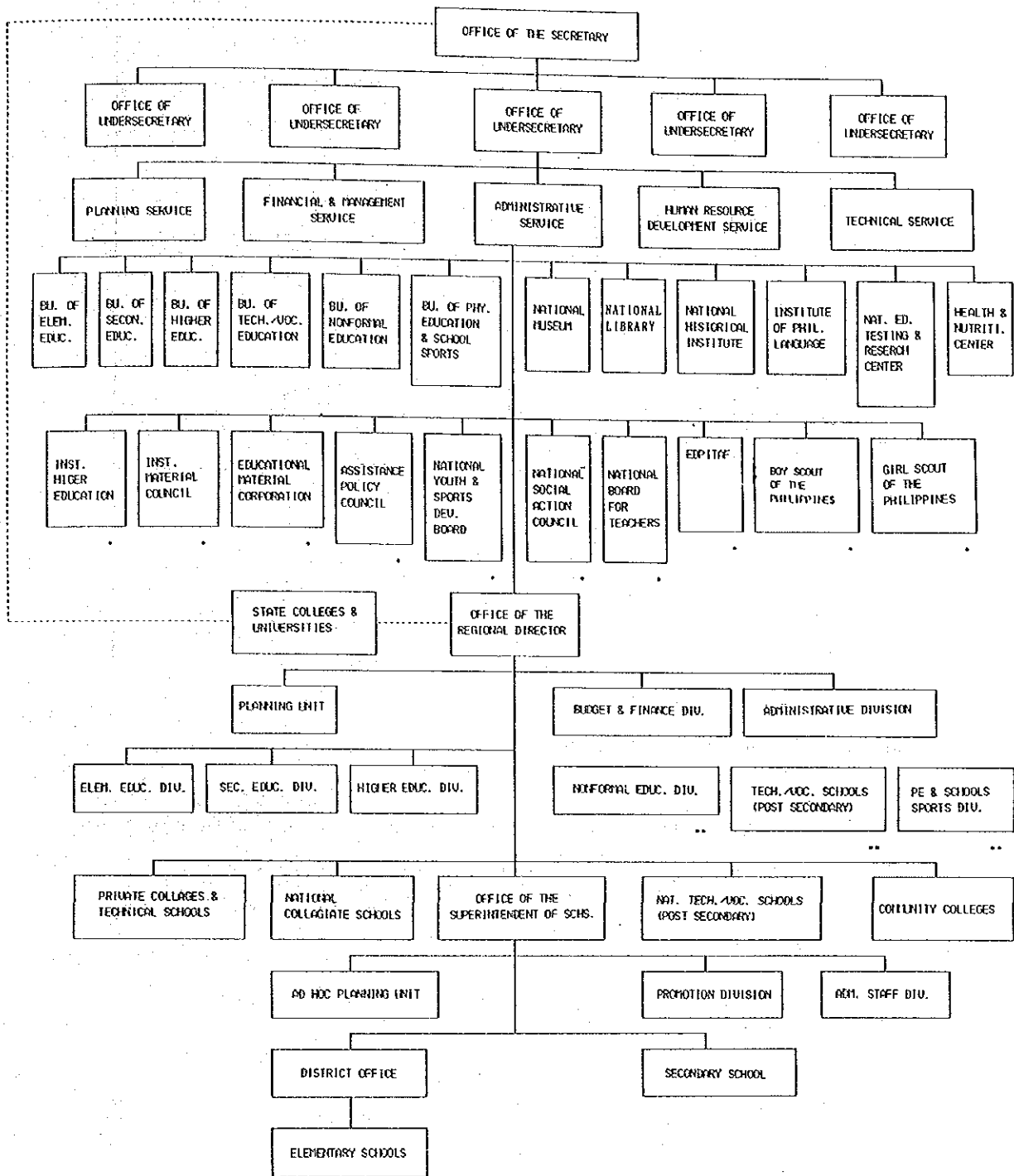
4-3-1 Implementing Agencies

DECS, with the cooperation of DPWH, will undertake the Project's implementation. DECS will be responsible for the final selection of the schools to be constructed. DPWH will be responsible for the actual construction work.

At the DECS central office, the Office of the Planning Service in coordination with the Bureau of Secondary Education, the Regional Office and the DPWH will compose the Project Technical Staff which includes educational facilities researchers, planning analysts, architects, and engineers. They shall provide technical assistance and shall monitor the Project.

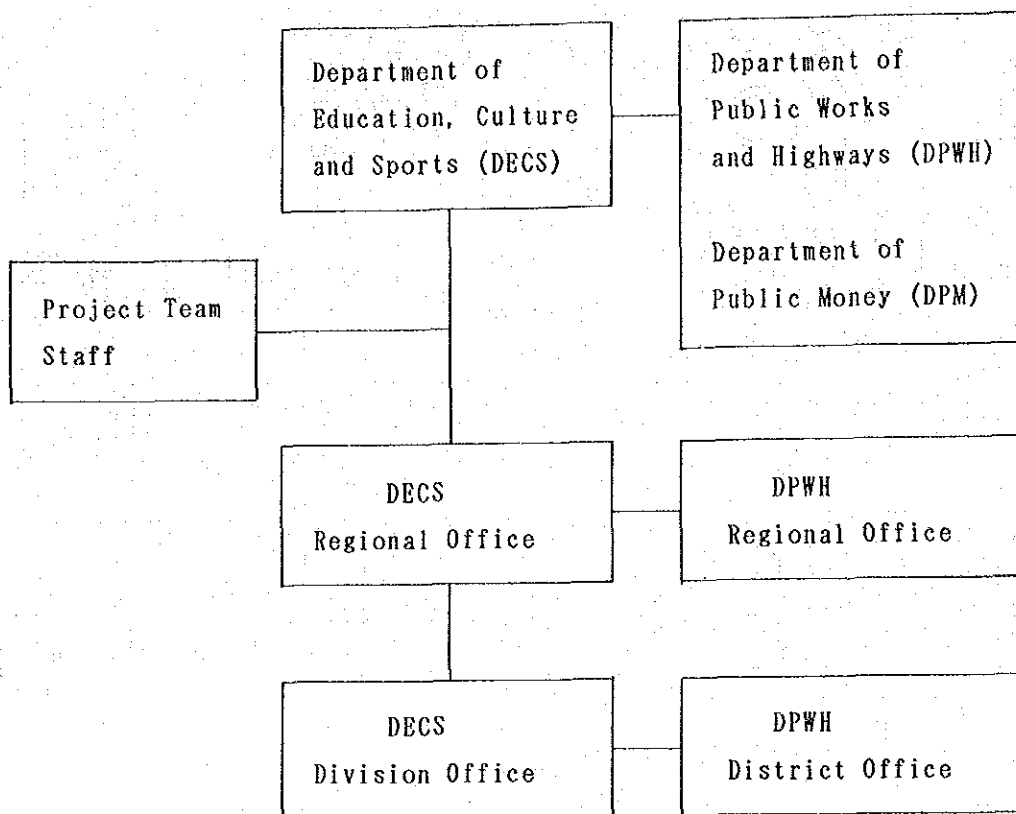
Fig. 4-1 shows the structure of DECS, the agency responsible for Project implementation, and Fig. 4-2 shows the Project's organizational structure in implementation.

Fig. 4-1 Structure of the Department of Education, Culture and Sports



- → Indirect Supervision
- * → Outer Governmental Agency
- ** → Planned Division

Fig. 4-2 Project Organizational Structure in implementation



4-3-2 Outline of Facilities and Equipment

Depending upon the number of students, primary schoolbuildings were classified into Types "A" and "B". Secondary schoolbuildings were classified into Type "A", "B" and "C". Each building will have an open corridor covered by a roof.

• Summary of Schoolbuildings

(1) Primary Schools:

• A Type: 234 m ²	Classrooms (40 students per class):	3
	Office (4 persons):	1
	Toilet, for males:	1
	Toilet, for females:	1

• B Type: 288 m ²	Classrooms (40 students per class):	4
	Office (4 persons):	1
	Toilet, for males:	1
	Toilet, for females:	1

(2) Secondary Schools:

• A Type: 288 m ²	Classrooms (42 students per class):	3
	Science Laboratory (42 students):	1
	Toilet, for males:	1
	Toilet, for females:	1

• B Type: 342 m ²	Classrooms (42 students per class):	4
	Science Laboratory (42 students):	1
	Toilet, for males:	1
	Toilet, for females:	1

• C Type: 432 m ²	Classrooms(42 students per class):	4
	Science Laboratory (42 students):	1
	Workshops (42 students):	1
	Toilet, for males:	1
	Toilet, for females:	1

• Summary of Equipment

(1) Primary Schools

- * Classrooms:
 - Teachers' desks, chairs, closets
 - Students' desk-chairs (large, medium, and small types) and closets
 - Blackboards and bulletin boards
- * Offices:
 - Teachers and clerks' desks, chairs, and closets
 - Lockers, blackboards, and bulletin boards

(2) Secondary Schools

- * Classrooms:
 - Teachers' desks and chairs
 - Students' desks, chairs, and closets
 - Blackboards and bulletin boards

- * Science Laboratories:
 - Experiment tables, and demonstration workbenches
 - Students' chair and closets
 - Blackboards, bulletin boards, stowage shelves, steel shelves

- * Workshops:
 - Experiment tables, and demonstration workbenches
 - Students' chairs and closets
 - Blackboards, bulletin boards, stowage shelves, steel shelves

4-3-3 Criteria for the selection of schools in the Project.

Those areas having high growth rates of school-age children or being severely damaged by typhoons Sisang and Harming in 1987 were included in the Government's School Building Program. The selection of the areas and schools for the plan was made based on the following criteria:

1. Primary school Selection Criteria

- 1) The schools should be in big towns severely damaged by typhoons Sisang and Harming.

- 2) The schools should preferably be located in an area that has a large population, such that schoolbuildings could also be used as evacuation centers, and for other emergency purposes.

- 3) The Schools that are programmed to receive either from the regular School Building Program or from the Calamity Fund, should be excluded from the list of recipients.

2. Secondary School Selection Criteria

- 1) The schools should have their own school sites where the schoolbuildings are to be constructed.
- 2) A school receiving assistance either from the United States Agency for International Development or from the Asian Development Bank must be excluded from the list of recipients.
- 3) Schools allocated with capital outlays of more than 300,000 pesos during the 1986-1987 period are also excluded.
- 4) In listing of recipient schools priority is judged based on the total shortages of existing classroom deficiencies like classrooms, science laboratories and workshops compared with the records of the Educational Facilities Division, Bureau of Secondary Education.
- 5) The allocation of schoolbuildings to the different regions and/or divisions is determined based on the program prepared by the office of Planning Service, DECS, Manila, by phases.

Based on the above selection criteria, 360 primary and secondary schools were selected for the Project.

72 schools in the Bicol Region that are most urgently needed, were selected for the first phase of the Project. Although the original request included schools located on remote island, it would be difficult to transport building materials to these island so that those schools were excluded from the Project and other schools in main island were included. After examining the data sheets collected from proposed Project schools, some changes were made to Project's school list.

The following schools were selected for the Project:

Primary Schools

No.	Name of School	Type of Building
1	Ligao West Central School	B
2	Oas South Central School	B
3	Milaor Central School	A
4	Calabanga Pilot Central School	B
5	Traversia Elementary School	A
6	Donsol East Central School	A
7	Bacon East Central School	A
8	Balogo Elementary School	A
9	Butag Elementary School	B
10	Bagumbayan Elementary School	B
11	Naga City North Central School	B
12	Vinzons Pilot Elementary School	A
13	Daet North Central School	B
14	Bato South Cental School	A
15	Bogon Elementary School, Legaspi	A
16	Bulan South Central School	B
17	San Jose Elementary School	A
18	Bacacay East Central School	A
19	Daraga North Central School	A
20	Tabaco South Central School	A
21	Sta. Magdalena Central School	A
22	Pioduran West Central School	A

Secondary Schools

No.	Name of School	Type of Building
1	Marcial O. Ranola Memorial School	A
2	Malabog Barangay High School	B
3	Colacling High School	A
4	Prieto Diaz High School	B
5	San Francisco Barangay School	A
6	Rizal Barangay High School	B
7	Basud Barangay High School	B
8	San Lorenzo Barangay High School	A
9	Pagasa National High School	C
10	Polangui Gen. Comp. High School	A
11	Salvacion Barangay High School, Bato	A
12	Nabua National High School	C
13	Salvacion Barangay High School, Tigaon	A
14	Tinambac Barangay High School	B
15	San Ramon Nationalized High School	A
16	Del Gallego Barangay High School	B
17	San Isidro Barangay High School, Libmanan	A
18	Milaor National High School	B
19	Shinuknipan Barangay High School	A
20	Sta. Junstina High School	A
21	Palsong National Secondary School	A
22	Sto. Tomas Barangay High School	A
23	Tawog High School	A
24	San Fernando Barangay High School	A
25	San Isidro Barangay High School, Bulan	A
26	Pilar Productivity Dev't High School	C
27	Casiguran Vocational High School	A
28	Bulan Vocational High School	A
29	Masarawag High School	A
30	Linbon Agro-Industrial High School	A
31	Sanam Jogj School	A
32	Malio High School	A

Secondary Schools (Cont'd)

No.	Name of School	Type of Building
33	Matacon High School	A
34	San Antonio High School	A
35	Gallanosa High School	B
36	Batobalani High School	A
37	Abuyog High School	A
38	Sorsogon National High School	A
39	Vinzone High School	B
40	Rizal High School	B
41	Tabaco National High School	C
42	Gavasi High School	A
43	Macalaya High School	A
44	Hobo High School	A
45	Bariw High School	A
46	Paulba High School	A
47	La Purisima High School	A
48	Malansad Nievo High School	A
49	Matacong Hih School	A
50	Bagacay Barangay High School	A

4-3-4 General Condition of the Project Area

The Project Area is in the Bicol Region, located on a peninsula that extends southeastern part of the Luzon Island of the Philippine archipelago. Under the Project, 22 primary and 50 secondary schools are to be constructed throughout the Bicol Region which stretches 180 km in a north-south direction from Camarines Norte and Camarines Sur to Albay and Solsogon, and about 200 km in an east direction.

The Philippine Government's original request included the construction of 12 primary and secondary schools on remote islands, two primary and five secondary schools on Masbate Island, two primary and one secondary schools on Catanduanes Island, one secondary schools on Burias Island, and one secondary school on Rapu-Rapu Island. However, the study team considered that the transportation of the equipment and materials necessary for the Project construction work would be very difficult because of poor transportation system and poor road condition. As a result of discussion held with the Philippine officials concerned, these schools in remote island were excluded from the Project, and as an alternative, other schools in main island were included in the Project.

The major infrastructures in the Project Area include electricity and water supply facilities and sewerage facilities. Electricities in the Bicol Region is supplied by 220V power lines. Electricities will be installed to the new schoolbuildings at the school sites where electricities will be available.

35 of the 72 Project schools are presently using well water. the remaining 20 schools have piped water supply facilities; however, since the water pressure is almost zero, it will be required to install elevated water tanks. Nine of the 72 schools have no water facilities. It would be virtually impossible to install electric power lines to ten of the 72 schools. Project schools do not have sufficient sewerage facilities. Thus, septic tank will be installed to treat the sewerage. Rain and waist water will treated by the infiltration method.

The Philippine Government shall be responsible for the construction of the wells at the school sites where no water supply is available prior to the commencement of the construction of the Project.

CHAPTER 5 BASIC DESIGN

CHAPTER 5. BASIC DESIGN

5-1 Basic Design Policies

The following basic design policies were established based on the contents of the Philippine Government's request and on the series of discussions held with the Philippine officials concerned during the field survey period:

- (1) The design must be prepared with emphasis placed on typhoon-resistant capability:

The Philippines suffers from the effects of typhoons every years. The school facilities in the Bicol Region -- the Project Area -- were, in particular, severely damaged by typhoons last year.

The schoolbuildings under this Project will be used as places of refuge by area residents. Thus, the buildings must be designed as typhoon-resistant structures that will be durable for many years. There is no necessity of high-grade quality, nor elaborate decorative designs.

- (2) The design should be emphasized on the uniformity of the construction work:

A distinctive point of the Project is that schoolbuildings for 72 primary and secondary schools must be constructed, within a one year period, although they are scattered throughout the 180 km (north-south direction) by 200 km (east-west direction) Bicol Region. Therefore, the uniformity of construction work will be the most important factor for project implementation. The design must be made by emphasizing on the uniformity of construction work in order to complete all of the schoolbuildings of the same quality within a one year period.

(3) The design must be flexible so that all buildings will have multi-purpose uses:

The schoolbuildings will be used for various purposes, such as meeting places for area residents, places of refuge during calamities and disasters, places where teachers can be trained during summer vacation periods, etc.

(4) The design must be made to suit various situations in the Philippines:

The building design should be made based on the school facility design standards of the Philippines and by taking into consideration the Filipino way of living. The Philippines is situated in the tropical climate zone. The average annual temperature is from 26 to 27° C. This must be taken into account in determining the type of ventilation and the type of insulation to be used in the building.

5-2 Examination of Design Conditions

Since the Project calls for the construction of 72 schoolbuildings at widely scattered sites within a short period of time, not only will the examination of construction methods be an important factor for the successful implementation of the Project, but so will be examination of the construction management system.

Project objectives have the nature of being a school expansion plan for accommodating students with existing schools when, due to the high increase rate of students, the classrooms are filled to capacity. Therefore, in addition to the general basic design criteria, the relationship between existing schoolbuildings and new schoolbuildings and the effects of Project construction on school activities must be considered as the Project's design condition.

(1) Examination of the Natural Environment and Meteorological Conditions.

As a general principle, the schoolbuildings should be designed to have large openings for natural ventilation purposes. Eaves that are long, but strong enough to withstand typhoons, should be installed on buildings in order to provide protection against the strong westering sun. Roofs must be insulated to act as barriers against the sun's radiant heat.

Open corridors with roofs should be built to offer students and teachers shelter as they move from classroom to classroom on rainy day. The corridors will be designed so as to prevent the entry of raindrop splashes, mud, and dirt. Some schoolbuildings will be built near beaches. Possible salt damage must be taken into consideration at designing these building. During the field survey period, schoolbuildings were found to have termite damage. During the design stage, antitermite treatment of wooden structure must be considered.

The average annual precipitation in the Bicol Region is 3,256.4 mm. In this area, it will be necessary to consider measures against possible flooding -- elevated building foundations must be designed.

As a general principle, natural lighting must be fully utilized. Electric lighting will only be used on occasions when classes are conducted during dark, rainy days. Obtaining the sufficient natural lights at the center of classrooms is a very important factor for the building design. For this reason, building beam spans shall be limited to 8 m. Wooden jalousies shall be painted white to increase lighting efficiency.

(2) Examination of Social Factors

The schoolbuildings will not only be used for classroom; they will also be used for other purposes, such as area residents' meeting places, places for taking refuge during calamities, etc. Therefore, in order to create larger spaces, movable partitions must be designed for installation between classrooms. Electric lighting should be installed in schoolbuildings in the case that the electric power lines are available. Electric lighting will also be needed when residents hold meetings at the schools in the late evening.

(3) Consideration Given to Handicapped Students Safety and Conveniences

It is natural for students to run in school corridors. To prevent students from injuring themselves, round-shaped columns must be used for corridor structures. For the sake of safety, the use of independent columns in classrooms should be avoided if possible. As specified in Philippine law (BATAS PAMBANSA BILANG 344; Accessibility Law), school facilities are for equal use by all students; therefore, consideration shall be given to the installation of sloped accesses and specially designed toilets as conveniences for handicapped students.

(4) Examination of the Construction Method

To meet the urgent need for implementing the Project, it will be necessary to adopt a unit systematized prefabrication method that will enable to construct 72 schoolbuildings within one year.

(5) Examination of Equipment and Material Transportation

By taking into account the ranges of allowable loads of the bridges located in the mountainous and rural areas, and by giving consideration to the insufficient infrastructures in these areas, the structure units to be manufactured at the factories must be designed to weigh less than 300 kg per unit in order to fit into a container. By doing so, the material can be transported relatively easily.

(6) Examination from the Viewpoint of Construction

For construction, consideration must be given to avoiding any disturbance that might interfere with the school activities in the existing schoolbuildings. Special attention must be given to ensure the safety of the students. When building materials are delivered to the construction site, care must be taken as not to create any noise or dust.

(7) Examination of Project Site Conditions

If an existing schoolbuildings has insufficient basic facility capacities, electricity and water supply lines and sewerage system are not capable to handle additional buildings. New independent basic facilities shall be installed for the new schoolbuildings. The new schoolbuildings to be constructed with ample space shall be arranged properly to allow for the installation of independent water and electric supply and sewerage facilities for the building without disturbing the existing major facilities.

(8) Examination of the Project from the Viewpoint of Maintenance and Management

In due consideration of the difficult financial situation of the Government of the Philippines, the Project's building plan must provide for a simple and economical maintenance and management system, i.e., a Maintenance free building design by taking into consideration the Philippine Government's financial difficulties.

5-3 Building Size

The Philippine Government's original request called for construction building at 72 primary and secondary schools using only two standard types of building; one type for the primary schools, and one type for the secondary schools. The building types were decided upon without giving consideration to the lack of school facilities due to the increase in the number of students and the degree of typhoon damage. The Government was aiming to alleviate the chronic shortage of classrooms and their intention was to request Japanese grant aid for constructing about 40% of the schoolbuildings, to seek aid from the United States Agency for International Development and loans from the Asian Development Bank for the construction of additional schoolbuildings, and to undertake the construction of the remaining schoolbuildings on their own.

Considering the conditions described above, and the number of students and the size of each school the Study Team proposed the construction of two types of primary schoolbuildings (types "A" and "B") and three types of secondary schoolbuildings (types "A", "B", and "C"). The Study Team's proposal was accepted by the Philippine Government officials concerned. Optimum room sizes were decided upon by referencing Philippine building design standards and comparing them to Japanese building design standards.

Using the prefabrication construction method, the optimization of the smallest building element unit will result in the lowering of construction costs, the shortening of the construction period, and the simplification of the construction work.

Since the smallest facility element for the Project is the toilet, the smallest building element unit of 8 m x 2.25 m was decided upon from the layout plan of the toilet. One classroom size was decided upon as being three times the size of the smallest element, i.e., 8 m x 6.75 m (54 m²), with taking into consideration the number of students in one class and the arrangement of furniture in the classroom. With the consideration to the number of students in one class, the furniture arrangement, and the usage of the classes, the size of the science laboratory decided upon as being five times the size of the smallest element, i.e., 8 m x 11.25 m (90 m²), and the size of the workshop was decided upon as also being 8 m x 11.25m (90 m²).

Considering the number of teachers and clerks, the size of the administration office was decided upon as being 8 m x 4.5 m (36 m²), or two times the size of the smallest element. The features of each Project schoolbuildings are shown in table 5-1.

Table 5-1 The features of Project Schoolbuildings

Building Type	Name of Room	No. of Units	Area (m ²)	Remarks
• Primary School Type A	Classrooms	3	162	40 Students per room 4 persons.
	Office	1	36	
	Toilet (Male)	1	18	
	Toilet (Female)	1	18	
Subtotal			234	For one school
Total			3,276	14 schools
• Primary School Type B	Classrooms	4	216	40 students per room 4 persons
	Office	1	36	
	Toilet (Male)	1	18	
	Toilet (Female)	1	18	
Subtotal			288	For one school
Total			2,304	8 schools
• Secondary School Type A	Classrooms	3	162	42 students per room
	Science Lab	1	90	
	Toilet (Male)	1	18	
	Toilet (Female)	1	18	
Subtotal			288	For one school
Total			10,656	37 schools
• Secondary School Type B	Classrooms	4	216	42 students per room
	Science Lab	1	90	
	Toilet (Male)	1	18	
	Toilet (Female)	1	18	
Subtotal			342	For one school
Total			3,078	9 schools
• Secondary School Type C	Classrooms	4	216	42 students per room
	Science Lab	1	90	
	Workshop	1	90	
	Toilet (Male)	1	18	
	Toilet (Female)	1	18	
Subtotal			432	For one school
Total			1,728	4 schools
Total Floor Area:			21,042 m ²	

5-4 Site and Building Arrangement Plan

Building arrangement must be made by taking into account the following aspects:

- 1) A new building shall be arranged as being functional as one school complex together with existing facilities. This arrangement plan shall be made by taking into consideration the people's moving line between the new building and the existing facilities.
- 2) A new building shall be arranged on flat land, avoiding dipped areas, from the viewpoint of the building structure's safety.
- 3) A new building's longitudinal direction shall be decided upon by taking into account the prevailing wind direction in order to utilize the wind for natural ventilation. The building shall be arranged by considering the distance from existing buildings in order to allow drafts to blow between the new and existing buildings and to avoid wind force concentration during typhoon periods.
- 4) A new building's longitudinal direction shall be decided upon by taking into consideration the sunshine entering the classrooms.
- 5) Classrooms shall be arranged by taking into account workshop noises.
- 6) A new building shall be arranged not to adversely affect existing facilities. The building shall be arranged to allow for the installation of economical facilities and electrical supply line.

5-5 Building Design

5-5-1 Floor Plan

When the prefabricated unit construction method is used, the setting of the module is a very important matter for reducing construction costs and time. DECS's school construction manual specifies that the size of one classroom shall be 6 m by 8 m. The Japanese standard is almost the same. It is reasonable, then, to adopt DECS's standard for the Project. The minimum unit size of the module for Project buildings was decided upon as being 8 m x 2.25 m based on the layout of the toilet. Thus, each room for Project buildings was designed based on the minimum unit size of the module -- the administration office as 8 m x 4.5 m (2.25 m x 2), classrooms as 8 m x 6.75m (2.25 m x 3), and the science laboratory and workshop as 8 m x 13.5 m (2.25 m x 6).

By taking into account toilet odor, the toilets were arranged at the edge of the building next to the administration office. This will allow the school's staff to carefully manage the toilet. The science laboratory was arranged close to the toilet for the purpose of keeping the installation work of water supply and drainage pipe to a minimum. Because of the noise created in workshops, they were arranged as independent buildings. They are located close to the administration office for easy accessibility and management and for eliminating possible long moving lines.

Judging from the Project site areas' population, the number of student, the environmental conditions, and the condition of the existing schoolbuildings, two types of primary school buildings and three types of secondary school buildings are to be constructed. The arrangement plans shall be made to suit school needs and area conditions by using these five types of floor plans.

Open corridors were arranged to allow teachers and students to easily move between classrooms and offices during rainy season.

5-5-2 Elevation Plan

The basis for the elevation plan is to match those of the existing facilities. The highest priority must be given to the strength of the building in order to withstand typhoons -- this is in accordance with DECS's school construction manual.

- 1) High insulation sandwich panels having a decorative finish of polyvinyl chloride material shall be used for the finishing material of the outer walls of buildings. From the viewpoint of easy maintenance and management, this material will be highly suitable.
- 2) Paint finished wooden jalousies and wooden doors with paint finish, that would be obtained locally, shall be used for the outer sashes and doors of the buildings. These shall be made to be easily replaced for maintenance and management purposes.
- 3) The largest possible openings shall be made in the outer walls to utilize natural lighting to the maximum degree.

5-5-3 Section Plan

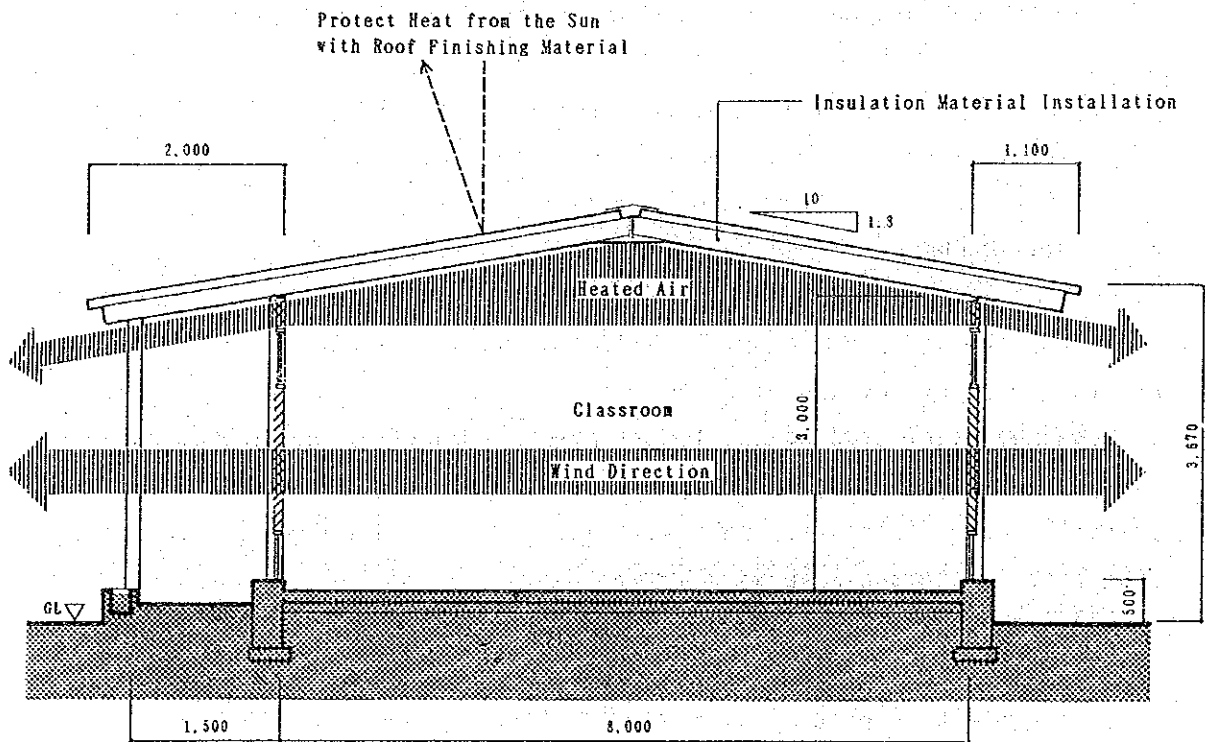
By taking into consideration the tropical climate of the Philippines, the section plans for the buildings were made to keep the ceiling height of 3.0m as the lowest point by adopting the graded ceiling in order to keep the thick air stratum as high as possible. Further, the installation of insulation material in the ceiling was designed to act as a barrier to the sun's heat.

All roofs will be built by the unit construction method using prefabricated unit materials manufactured in Japanese factories in order to assure their strength against typhoons.

The length of the eaves was decided upon from the viewpoint of the effects of intercepting the direct sunshine, providing protection against rain, and offering strength against uplifting wind forces. Eaves on the open corridor side are to be 2.0 m long -- 1.5 m from the building's wall to the corridor columns, and 0.5m from the columns to the tip of the eaves. Eaves on the other side of the building are to be 1.1m long.

The standard section views of Project buildings are shown in the figure 5-1.

Figure 5-1. Standard Section



5-5-4 Material Plan

1. Basic Requirements

Since the objectives of the Project are restoring and rebuilding the schoolbuildings in the Bicol Region that were seriously damaged by large typhoons, it is extremely important to select the building materials by taking into consideration their typhoon-resistant capabilities as the first priority. Furthermore, it is important to select materials that will be able to withstand high humidity and high temperature of the Philippines.

2. Major Materials to be Used

a) Structure Material

Weatherproof, lightweight shaped steel that provides a longer life than regular steel is to be used for the buildings' main members. This type of steel satisfies the requirement stipulated above.

b) Roof Material

Most of the schools in the Philippines are roofed with galvanized iron (GI) sheets. Unfortunately, most of the roofs are corroded. Thus, aluminum-zinc alloy plated steel sheets that have stronger anti-corrosion resistance than zinc plated steel sheets were selected. Also, un-coated aluminum-zinc alloy plated steel sheets have better sunshine reflecting capability than zinc plated steel sheets. It is expected that the selected roof material will be helpful in preventing temperature rises in the rooms.

c) Windows

Sliding glass windows, that are used extensively in Japan, are very rarely found in Philippine primary and secondary school buildings. Instead of sliding glass windows, wooden jalousies are most commonly used. Wooden jalousies are a unique, ingenious contrivance of the Philippines that utilizes the merits of non-shattering, easily maintainable and manageable wood and yet allows effective natural ventilation. Therefore, it was decided to use wooden jalousies for the schoolbuildings; they are suitable for the Philippine environment.

d) Walls

It was decided to use long-sized insulating sandwich panels for wall material by taking into account their high insulating qualities.

3. Finish Work

a) Exterior

- Roofs: Aluminum-zinc alloy plated steel sheets
- Roof and eaves edges: Waterproof plywood, S.O.P coating
- Walls: Long-sized insulating sandwich panels
- Windows: Wooden jalousies coated with S.O.P.
(locally made)
- Doors: Wooden doors coated with S.O.P.
(locally made)
- Baseboards: Cement mortar steel trowel finish
- Corridor floors: Cement mortar steel trowel finish
- Water receiving tanks: Reinforced concrete made (inside, outside, and tank top must be waterproof mortar steel trowel finish)

- Septic tanks: Reinforced concrete made (inside, outside, and tank top must be waterproof mortar steel trowel finish)
- Elevated water tanks: Steel frame structure support, FRP tanks, with hand pumps

b) Interior

* Office:

- Floors: • Colored cement mortar steel trowel finish
- Walls: • Dadoes--long--sized insulating sandwich panels
- Fixed partition walls--decorative plywood
- Side planks--long--sized insulating sandwich panels
- Removable partition walls--wooden panels
- Ceilings: • Decorative plywood

* Science Laboratories and Workshops:

- Floors: • Colored cement mortar steel trowel finish
- Walls: • Dadoes--long--sized insulating sandwich panels
- Fixed partition walls--decorative plywood
- Side planks--long--sized insulating sandwich panels
- Ceilings: • Decorative plywood
- Other
- Parts: • Workbenches with sinks -- 100mm tiled tops (science laboratories only)
- Side planks -- CHB mortar, E.P. coating

* Toilets (for male and female):

- Floor: • Local mosaic tiles on mortar bases
- Walls: • CHB mortar, V.P. coating, CHB dadoes
- Ceiling: • Decorative plywood

5-5-5 Structure Plan

1. Basic Requirements

The Project is to restore or rebuild the schoolbuildings in the Bicol Region that were seriously damaged by the large typhoon. Thus, the following three aspects are specifically required for the Project's building structure plan:

- A. Typhoon-resisting capabilities
- B. Durabilities
- B. Short construction period

The following two structure types can meet the above two requirements:

(1) The conventional steel frame structure types:

If this structure is to be adopted for the Project, Japanese made shaped steel will be shipped to the Philippines where, at Philippine factories, they will be prepared for use as structure members. The prepared structure members will be transported to each Project site where they will be prepared into a building. The roofs and walls will be constructed at the site.

(2) The steel frame prefabricated panel structure type:

Japanese made prefabricated members will be shipped to the Philippines after they are assembled into panels in Japan. The units would be transported to each Project site where they would be fabricated into a building.

From the viewpoint of typhoon-resistance capabilities, both of the above structure types would prove to be satisfactory if they were designed to handle a sufficient load.

Roof and eaves edges -- where wind force concentration would occur -- would be built at the sites if the conventional steel frame structure type was to be used. The quality of the roof and eaves edges built at the site may not be uniform and this could cause some problems. It is important to reduce construction time in the Philippines. Therefore, the study team believes that the steel frame prefabricated panel structure type will be preferable for Project use. Thus, the structure plan was made based on the steel frame prefabricated panel structure type as follows:

2. Design Policies

a) Design Load and External Forces

Basically, the Philippine National Structural Code for Buildings was used to determine the design loads for Project buildings. From the viewpoint of typhoon-resistance capabilities, the design loads were decided upon by taking into account not only the loads specified in the Philippine Code, but also the actual building damage conditions and loads specified in the Standards of the Japan Society of Architects.

"The Building Design Load Manual and Its Explanation", a Japan Society of Architects publication, specifies the external force factors for local wind forces. The Philippine Code does not specify any local wind force for building design. However, the design load condition of the Philippine code was adopted for the Project.

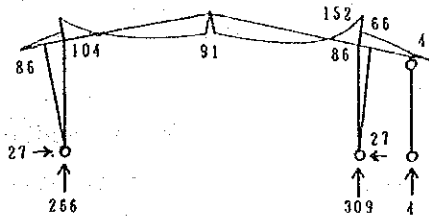
Examples of typhoon damages to buildings are shown in the "Building Damages in Hachijo Island Caused by Typhoon No. 13, 1975" published by the Japan Society of Architects. The typhoons that caused extensive damages in the Bicol Region in 1987 were about the same scale as typhoon No. 13. Many similarities were found between the above record and the recorded damages in the Philippines. Therefore, the design loads for Project buildings were decided upon after careful examination of the above publication.

b) Building Structure Plan

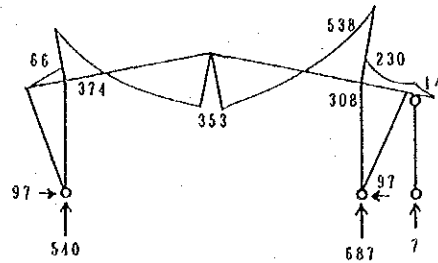
As described above, Project buildings must have enough strength to support fixed loads, live loads on roofs, wind forces, and seismic loads. The ways in which building structures will resist each load are described below:

1. Vertical external forces (fixed loads, live loads on roofs, and uplift wind forces on roofs) will be taken by the prefabricated module units (8mx2.25m per unit). The module units are to be weatherproof lightweight shaped steel frames.
2. Longitudinal direction horizontal external forces (wind forces and seismic forces) will be taken by the vertical braces on the side -- planks, and the fixed-partition walls, and the rigid frames of each module unit.
3. Beam direction horizontal external forces (wind forces and seismic forces) will be taken by the rigidity of the wall panels. In general, the beam direction of steel frame structures is the weaker structure direction against horizontal external forces. Vertical bracings are used to take care of the external forces. From an esthetic viewpoint, the exposed vertical braces are not desirable. thus, the horizontal external forces will be taken by increasing the internal rigidity of the wall panels instead of installing vertical bracings.

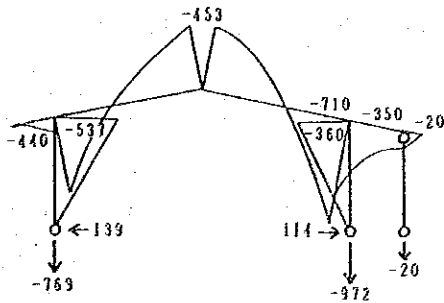
The results of the rigid frame structures' stress analyses against longitudinal direction horizontal external forces are shown below.



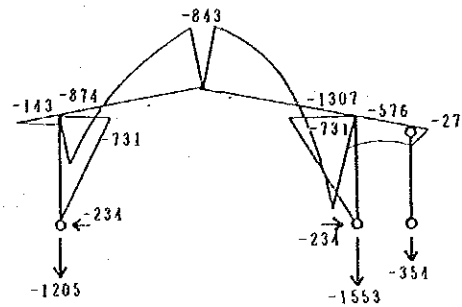
Fixed load



Roof Area Live Load



Wind Load
(Open Windward and Leeward)



Wind Load
(Only Windward Open)

* Vertical Component Only

Unit: kg·m

Mat foundation will be installed around the buildings. as an example, it was reported that the buildings destroyed by a typhoon in Hachijo Island were not fixed firmly to concrete block foundations and were lifted by wind forces.

The above stress analyses results show the effects of relatively strong lifting forces on column members. Therefore, it is necessary to consider the lifting forces in order to determine the mat foundation size and the method for fixing buildings to their foundations.

c) Design of Each Structure Member

The most influential force exerted on buildings will be the wind force. Thus, special attention must be paid to wind forces when designing the structure members.

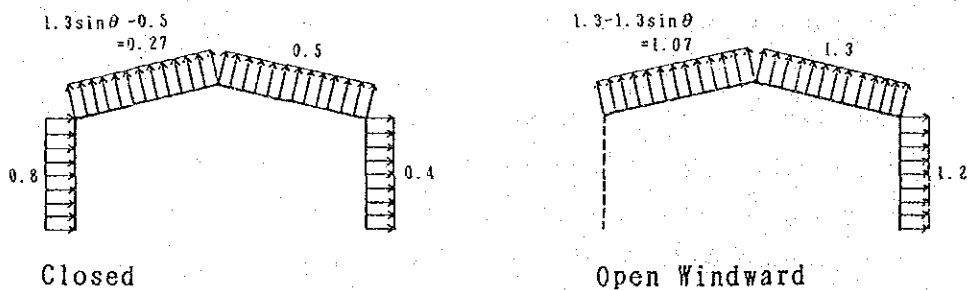
• Eaves Edges and Hoods:

During the field survey period, in particular, many damaged eaves edges and hoods were observed. Special attention must be paid when designing these parts of building because they will receive the impact of highly concentrated wind forces. Judging from the actual typhoon damage conditions, it is necessary to include the external force factors into the design load conditions.

One method of installing reinforced members to prevent eaves edge or hood deformation is to adapt a anti-deform member. The installation of these members shall be taken into consideration in the detailed design of Project buildings.

• Wall Panel's Strength Against External Forces:

"The Building Damages in Hachijo Island Caused by Typhoon No.13, 1975 " reported on the damaged buildings whose roofs were completely blown away by the lifting wind force that might have resulted after the collapse of the walls. Wind force coefficients for closed and open wall types are shown in the following figure:



As the above figure shows, the failure of walls will create enormous wind forces in the building which might result in the complete destruction of the building. Thus, it is necessary to pay special attention to wall panel strength against external forces. Since it is planned to utilize removable wooden jalousies -- to be made in the Philippines -- the details of window joints must be carefully examined.

• Joints Between Wall Panels

Careful examination must be made not only of the strength of the panel itself, but the strength of the panel joint must also be examined. For the panel joint design, it is necessary to consider special means, such as increasing the design safety factor of the panel itself in order to avoid panel failure at the joints.

5-5-6 Facility Plan

(1) Electrical Facility Plan

Only the installation of lighting fixtures and outlets were planned for Project buildings. In order to allow simple maintenance and management after Project completion, it was decided to install locally available single type fluorescent lighting fixtures. The designed number of fluorescent lighting fixtures, switches, and outlets for each room are shown below:

Name of Room	Number of Fluorescent Lighting Fixtures	Number of Switches	Number of Outlets
Office	4	1	2
Classroom	4	1	1
Science Laboratory	6	2	4
Workshops,	6	2	4
Toilet for Male	2	1	0
Toilet for Female	2	1	0

(2) Water Supply Facility Plan

It was designed to install water receiving tanks, hand pumps, 4.0m high elevated tanks, and piping systems. City supplied water or well water will be stored in receiving tanks, then pumped up by hand pumps into the elevated tanks. The water will be distributed from the elevated tanks to wash basins, urinals, water closets in each of the male and female toilets, and to the sinks in each science laboratory and office by gravity flow.

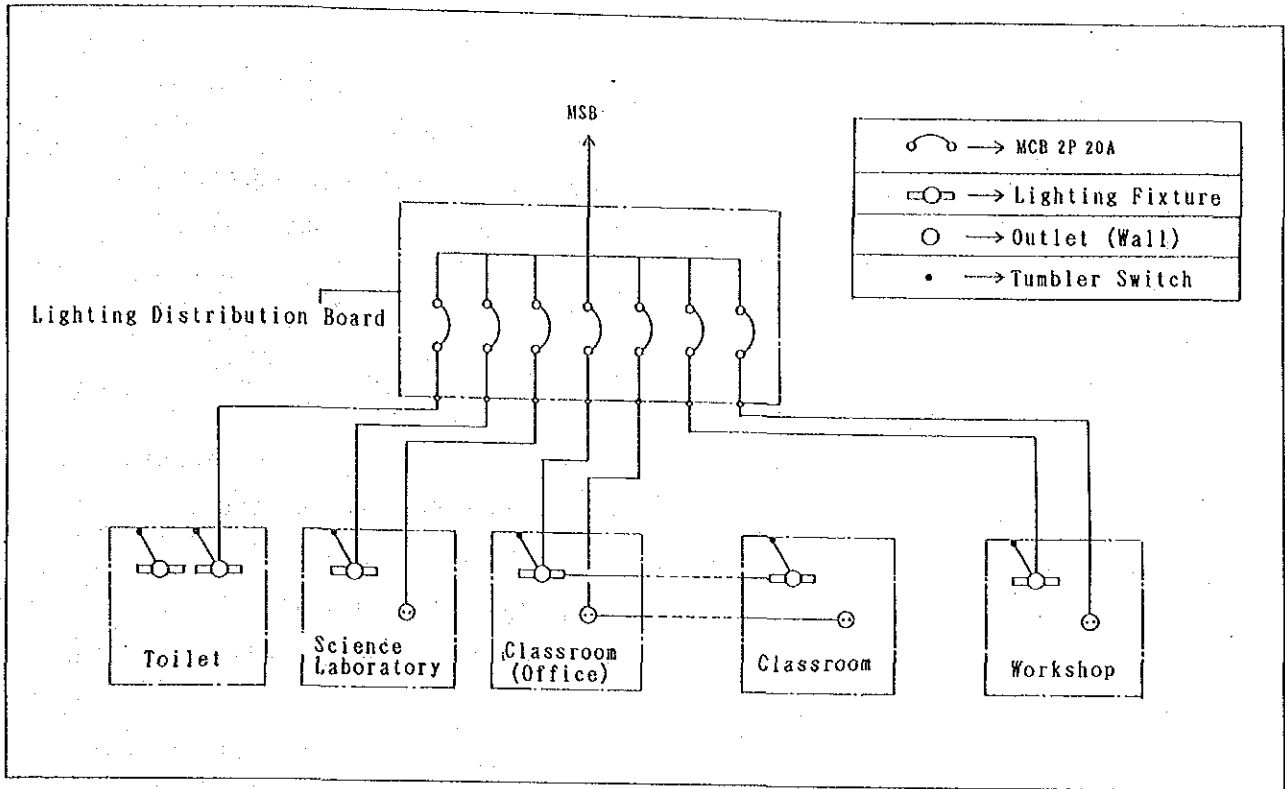
Water supply facility items include the following:

- Receiving Tanks: Reinforced concrete made, 1.0 m X 2.5 m X 1.0 m
- Elevated tanks: F.R.P. tanks, 2.0 m³ capacity
- Supporting structures for Elevated tanks: Steel angle bar frames
- Pumps: Hand pumps
- Piping material: PVC pipe

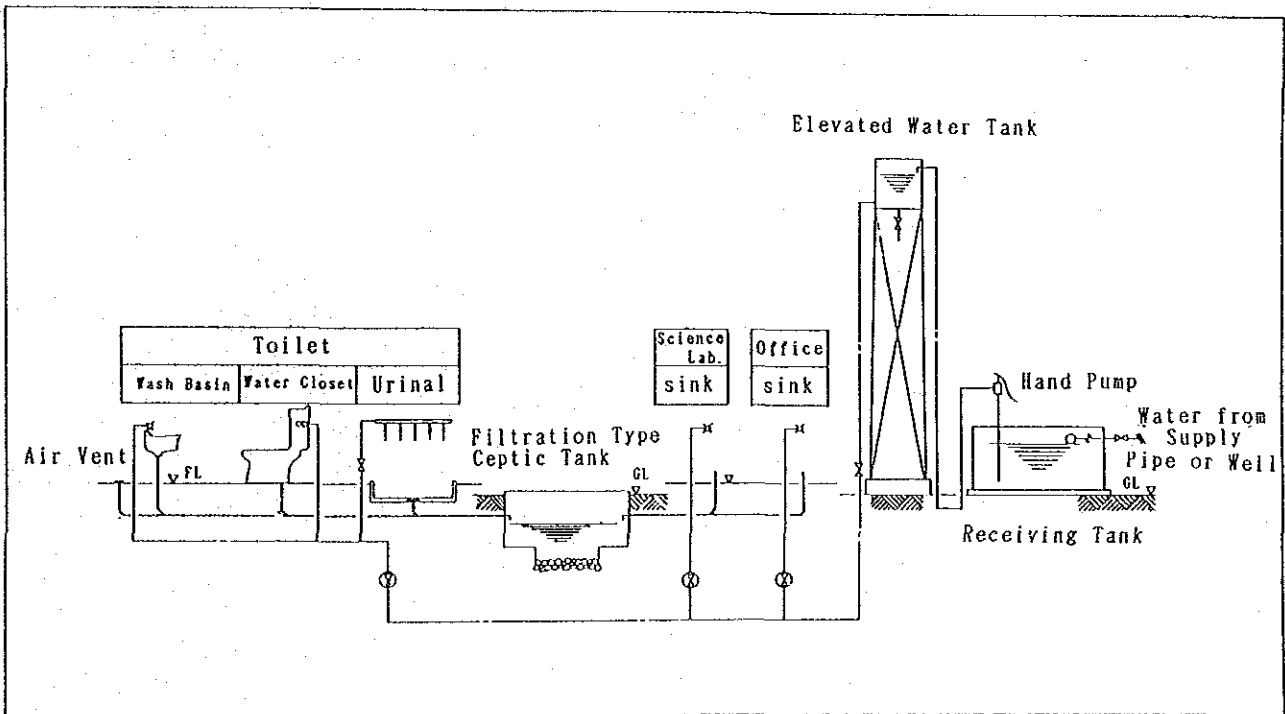
(3) Sewerage Facility Plan

It will be necessary to install sewage treatment facilities for sewerage as wash basins, urinals, and water closets of the toilets, and waste water as the sinks in the science laboratories. It was designed to treat the sewerage and waste water by simple infiltration type septic tanks. Sewerage facility items include the following:

- Water closets: Low tank flushing type
- Urinals: Multiple unit type, tiled
- Wash basins: China
- Piping material: PVC pipe
- Septic tanks: Infiltration type. Made of reinforced concrete (partially made of CB)



Lighting and Outlet Wiring Diagram



Water Supply and Sewerage System Diagram

5-6 Equipment Plan

In order to fulfill the educational conditions after the opening of the schools of this project, proper accommodations must be installed. Upon completion of the rooms, science laboratories, workshops, offices, and toilets in the Project buildings, various types of equipment will be moved in.

Based on the contents of the request for the Project and the results of the field surveys, the equipment necessary for school use will be provided under the Project. It was decided that the desks and chairs for the primary schools' classrooms would be the double-seated types. It was planned to provide three different sizes of desk and chair to suite the different body sizes of students. Single person desks and chairs that are generally used in the Philippines will be furnished in the classrooms of secondary schools.

For the science laboratories, three-person type tables were decided upon. One workbench -- to be used for teachers' demonstrations -- will be installed in each of the science laboratories. Workshop tables will be the same as those provided to the the science laboratories. One additional workbench will be installed in each of the workshops to be used for teacher demonstrations. Judging from the purposes for which they are to be used, it was planned to provide practical, strong equipment, and elaborate equipment was avoided.

The following equipment is to be provided under the Project:

Primary Schools

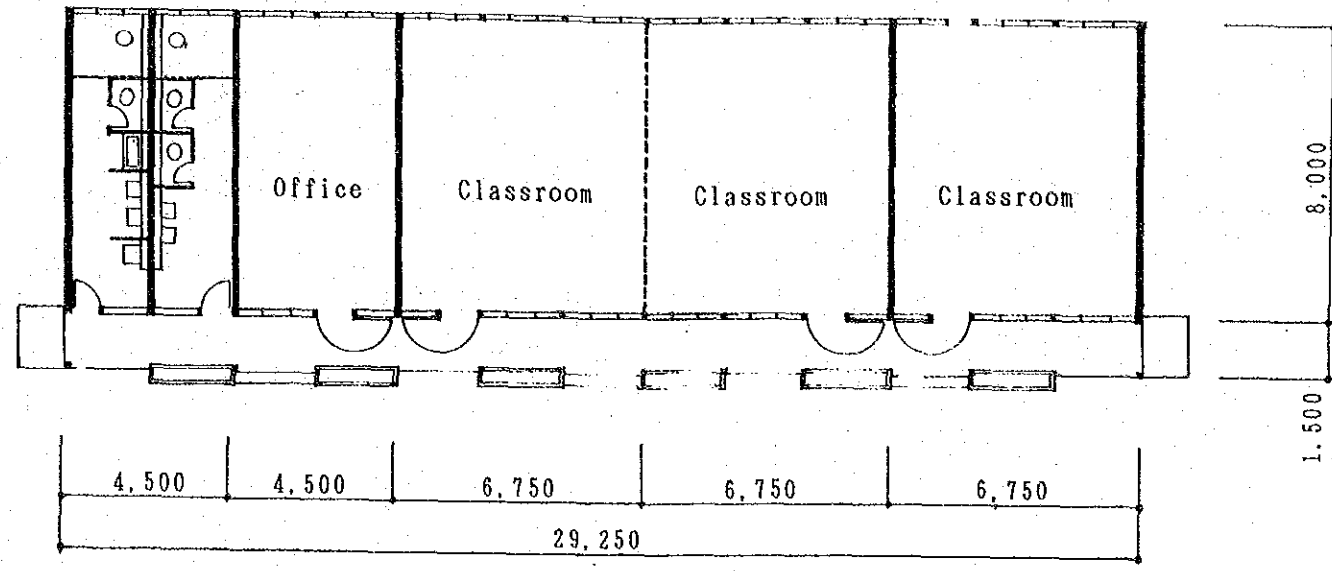
Name of Room	Name of Item	No. of Units
Classroom (for one room)	• Teacher's desk	1
	• Teacher's chair	1
	• Teacher's closet	1
	• Students' chair-desks (large size)	6
	• Students' chair-desks (medium size)	7
	• Students' desks and chairs (small size)	7
	• Students' shelves	8
	• Blackboard	1
	• Bulletin board	1
Office (for one room)	• Teachers and clerks' desks	4
	• Teachers and clerks' chairs	4
	• Teachers and clerks' closets	4
	• Lockers	4
	• Blackboard	1
	• Bulletin Board	1

Secondary Schools

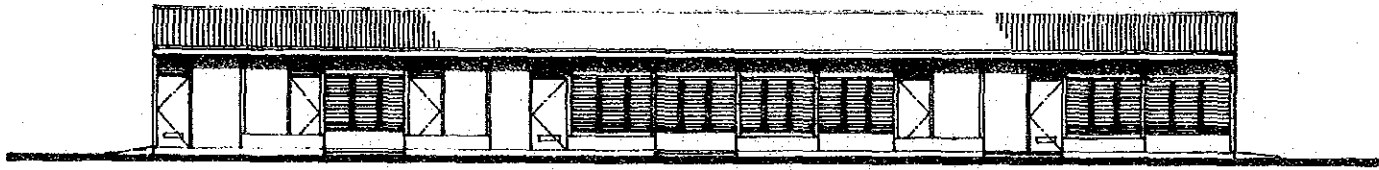
Name of Room	Name of Item	No. of Units
Classroom (for one room)	• Teacher's desk	1
	• Teacher's chair	1
	• Students' desks and chairs	42
	• Students' closets	8
	• Blackboard	1
	• Bulletin board	1
Science Laboratory (for one room)	• Experiment tables	14
	• Students' closets	5
	• Demonstration workbench	1
	• Students' chairs	43
	• Blackboard	1
	• Bulletin board	1
	• Storage shelves	1
	• Steel shelves	1
Workshop (for one room)	• Table	14
	• Students' closets	5
	• Demonstration workbench	1
	• Student's chairs	43
	• Blackboard	1
	• Bulletin board	1
	• Stowage shelves	1
	• Steel shelves	1

5-7 Basic Design Drawings

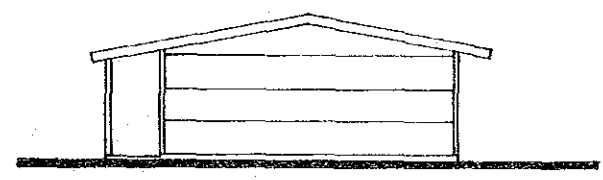
01. Elementary School	Type A	Plan· Elevation· Section
02. Elementary School	Type B	Plan
Secondary School	Type A·B	Plan
03. Secondary School	Type C	Plan· Elevation· Section
04. Elementary School	Type A·B	Equipment Plan
05. Secondary School	Type A·B·C	Equipment Plan



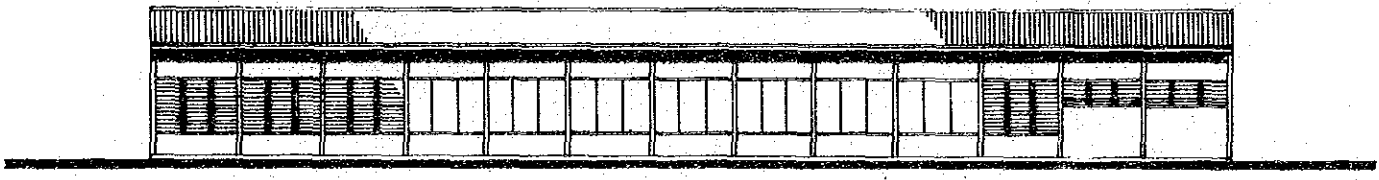
ELEMENTARY SCHOOL A-TYPE PLAN



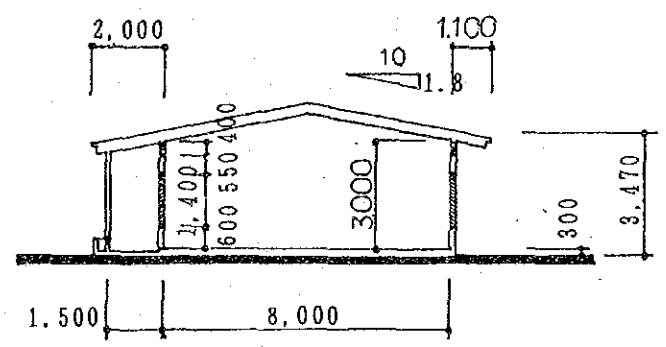
ELEVATION



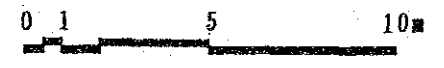
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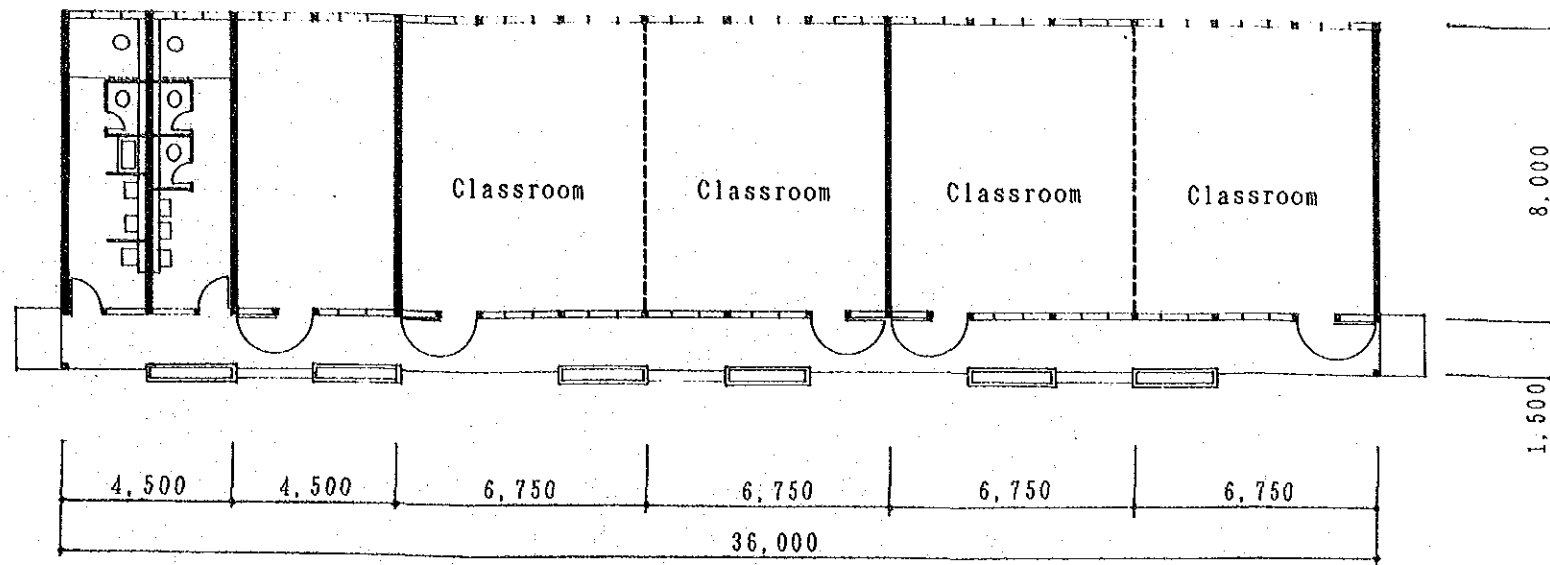


ELEVATION

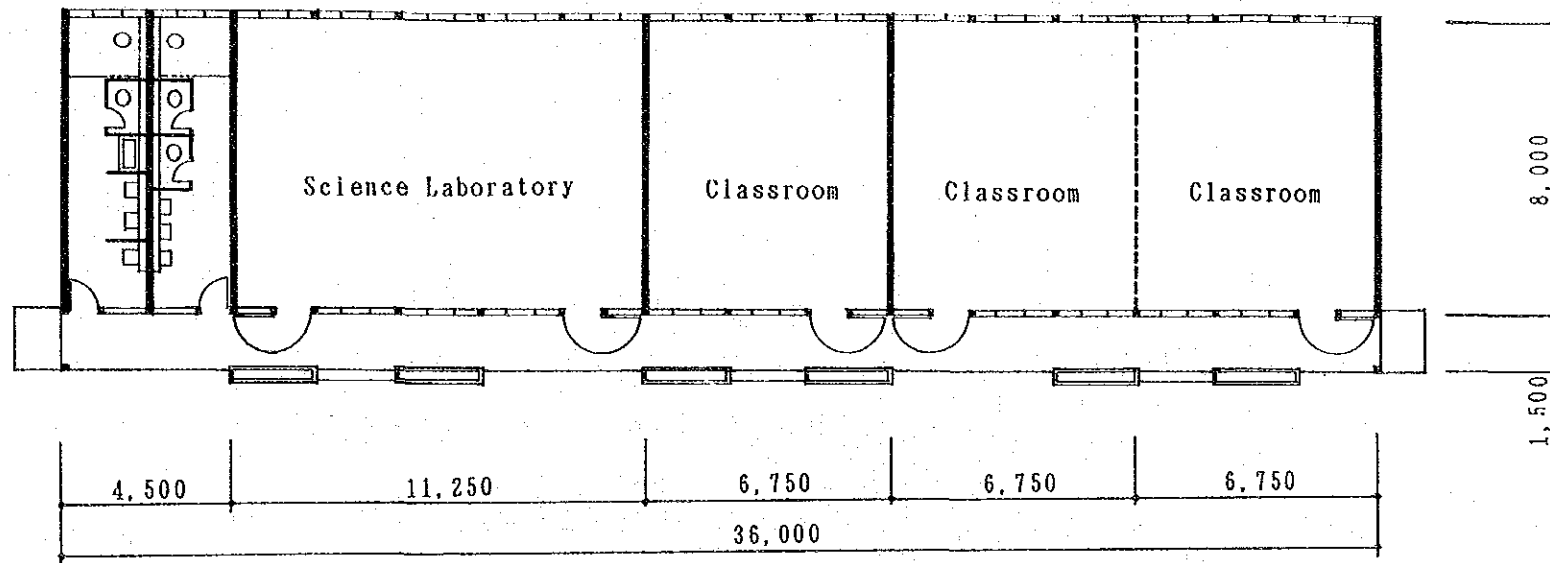


SECTION

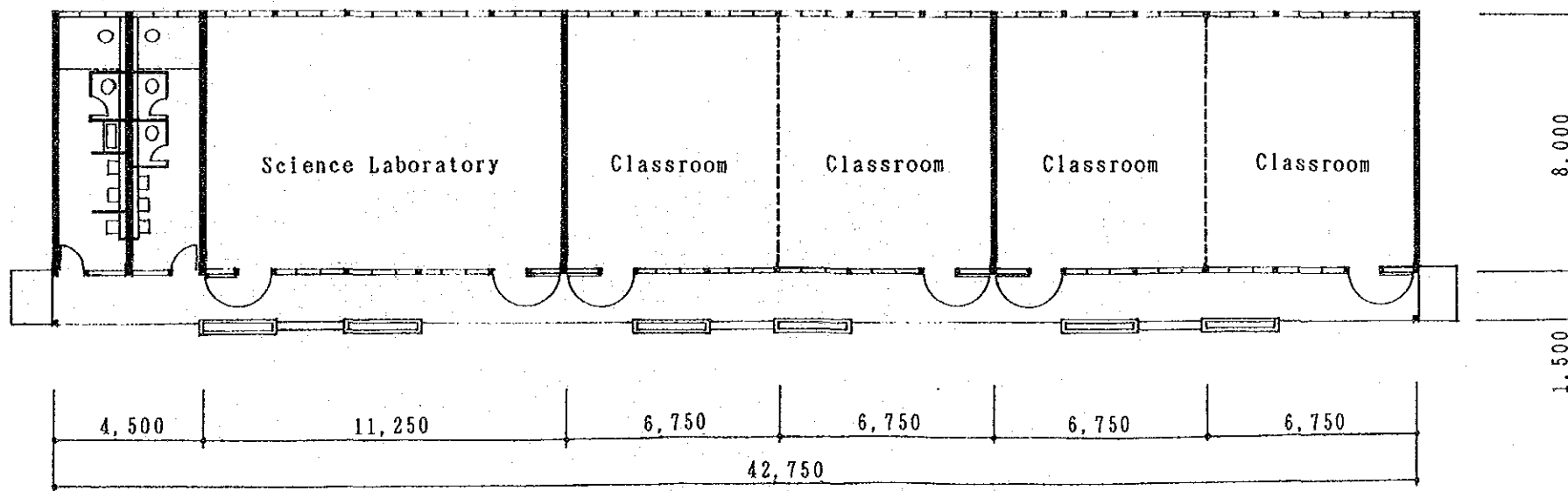




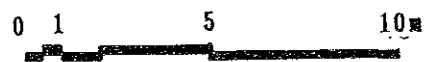
ELEMENTARY SCHOOL B-TYPE PLAN



SECONDARY SCHOOL A-TYPE PLAN

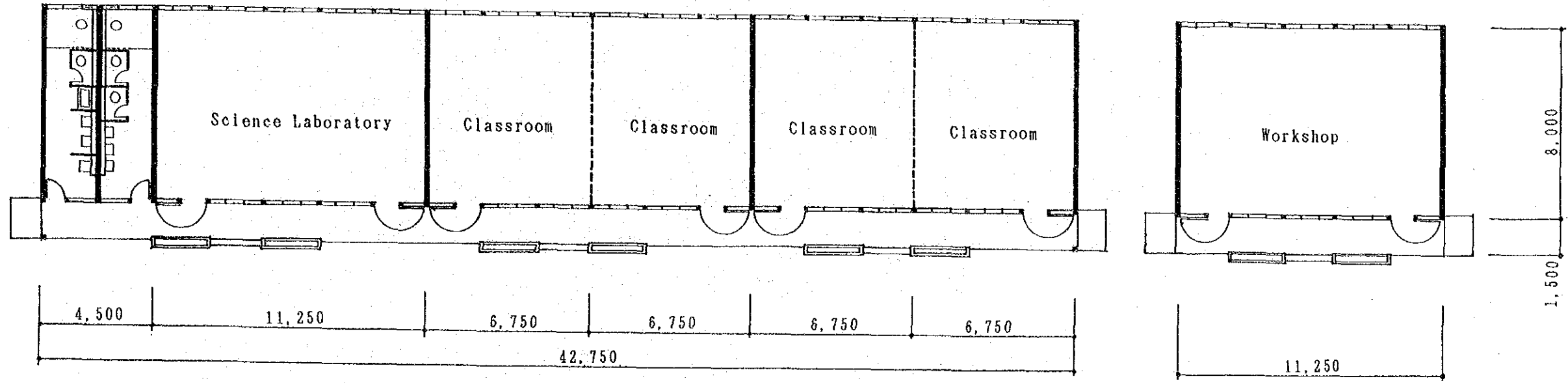


SECONDARY SCHOOL B-TYPE PLAN

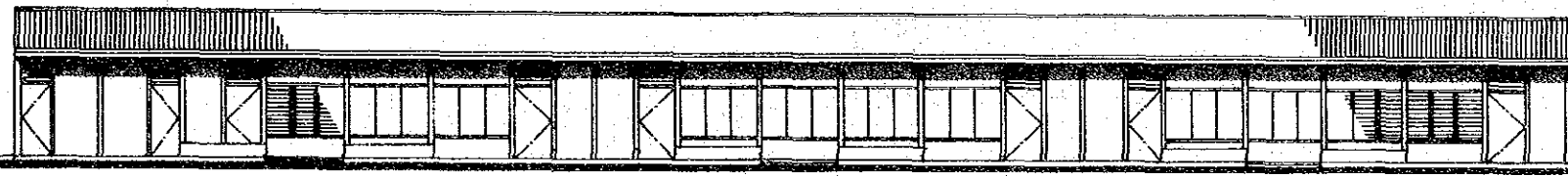


THE PROJECT FOR CONSTRUCTING PRIMARY AND SECONDARY SCHOOLBUILDINGS

ELEMENTARY SCHOOL B TYPE
SECONDARY SCHOOL A-B TYPE 02



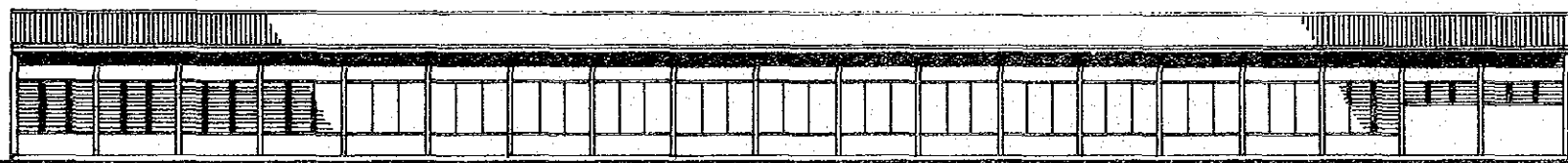
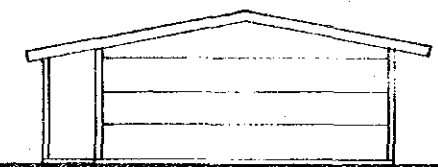
SECONDARY SCHOOL C-TYPE PLAN



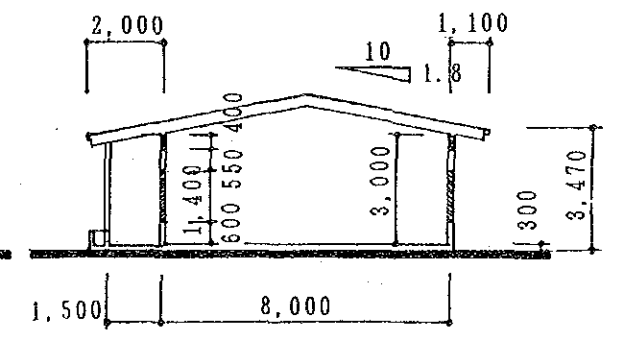
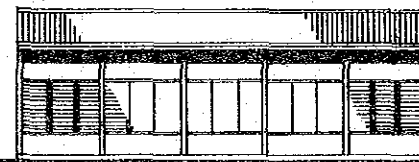
ELEVATION



ELEVATION

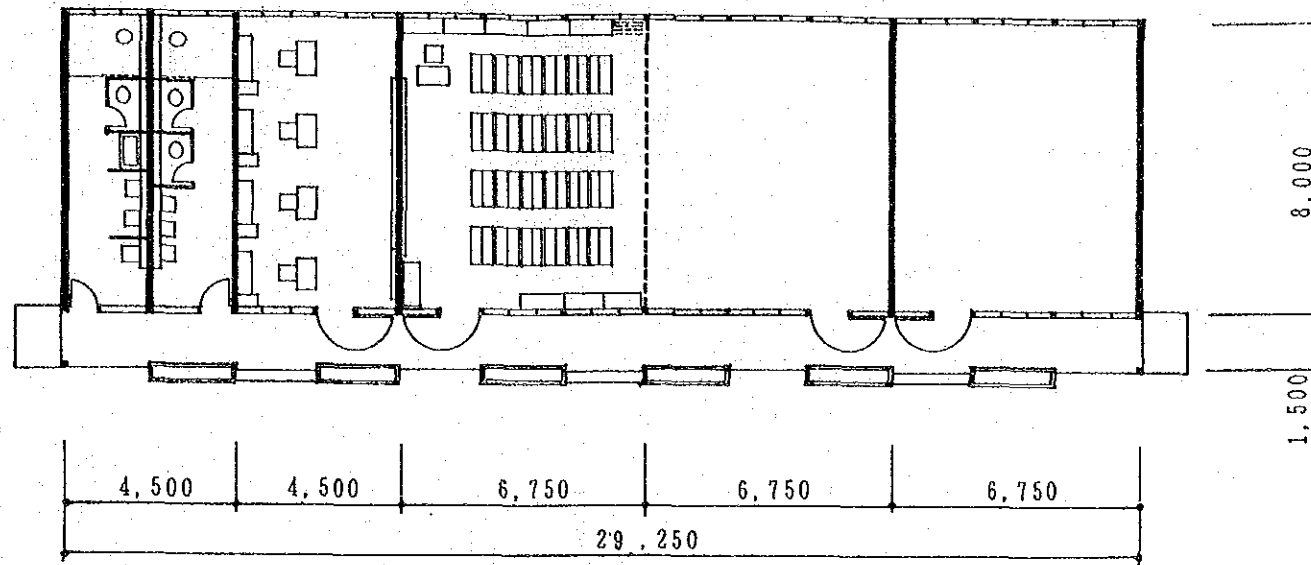


ELEVATION

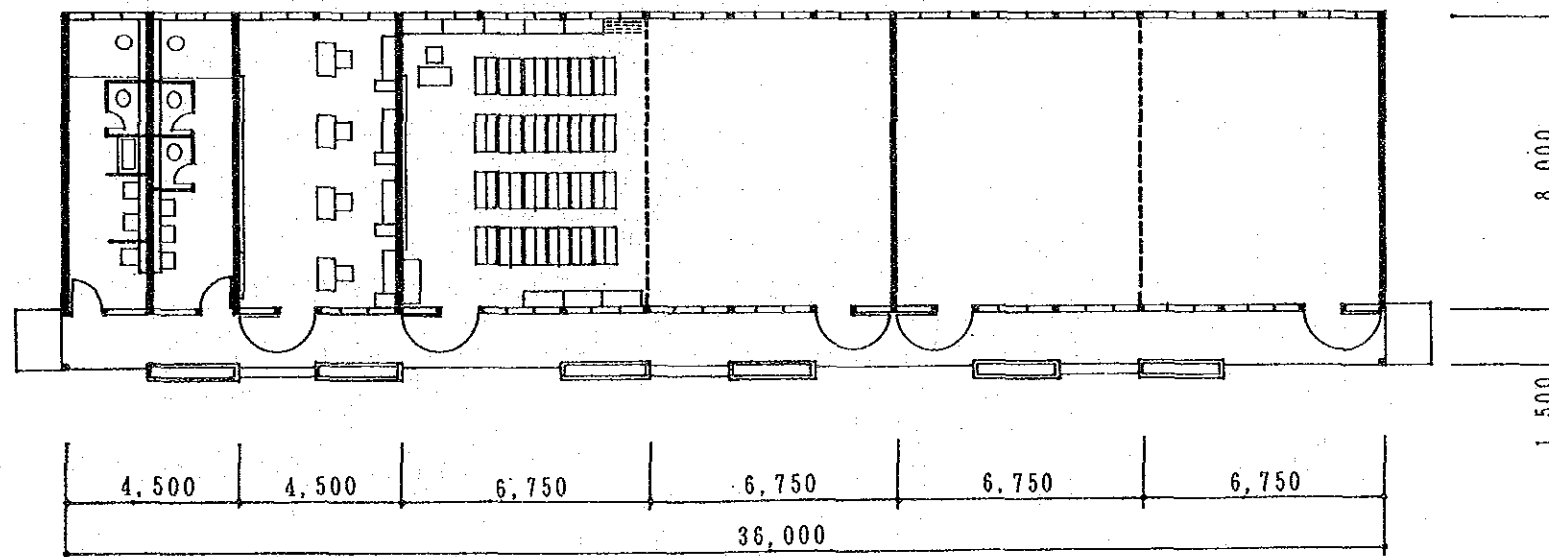


SECTION

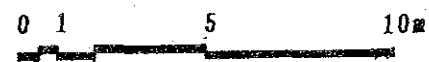


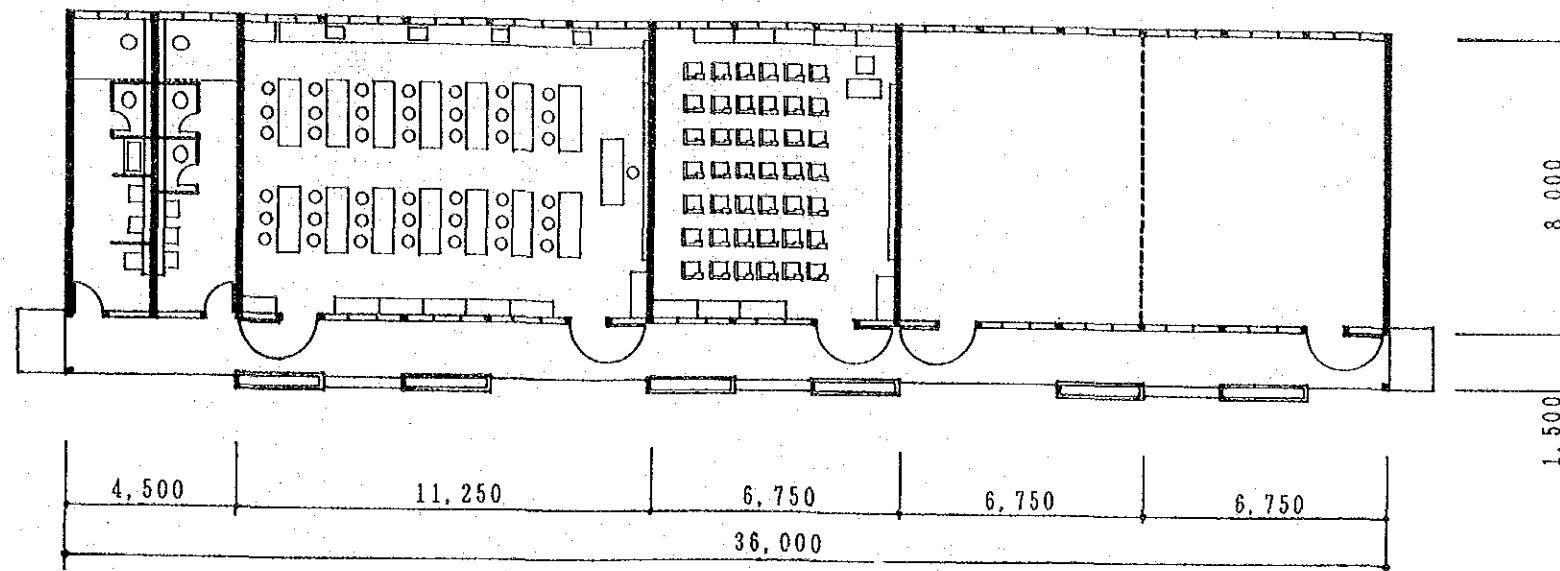


PRIMARY SCHOOL A-TYPE EQUIPMENT PLAN

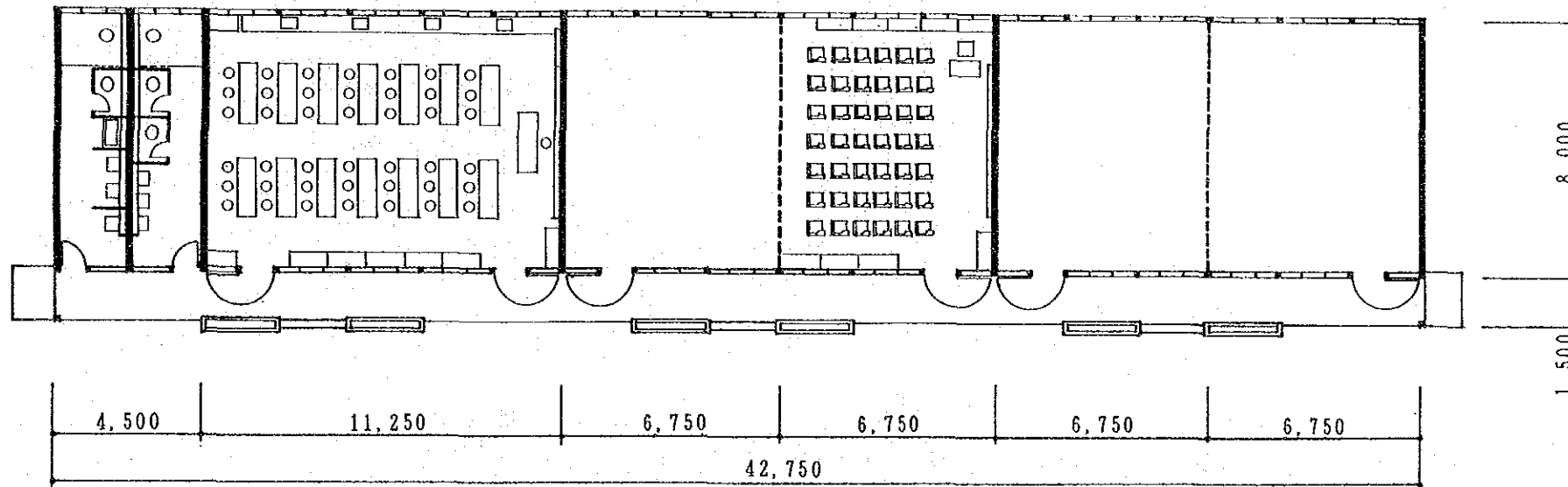


PRIMARY SCHOOL B-TYPE EQUIPMENT PLAN

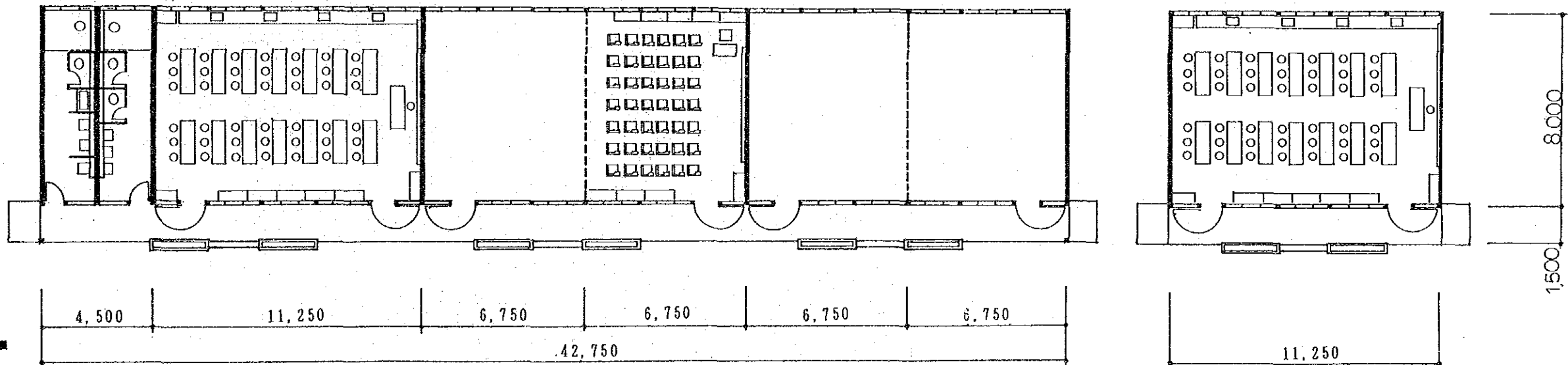




SECONDARY SCHOOL A-TYPE EQUIPMENT PLAN



SECONDARY SCHOOL B-TYPE EQUIPMENT PLAN



SECONDARY SCHOOL C-TYPE EQUIPMENT PLAN

