CHAPTER 4. BASIC DESIGN

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4-1 Design Policies

From the viewpoint of the Project's peculiarity in which many schoolbuildings must be constructed in a short period of time, Project construction procedures, in addition to the examination of construction methods at the design stage, is a very important subject for the Project.

Since the Project's schoolbuildings will accommodate those students who are presently unable to attend existing schools because of overcrowding, consideration must be given to the design criteria and to the relationship between Project facilities and existing schoolbuildings, giving special attention to Project construction to avoid interfering with present school activities, in the preparation of the Basic Design.

Based on the contents of the Government of the Philippines' request and the series of discussions held with concerned officials of the Government, the following Basic Design policies were established:

1) Design Policies for Natural Conditions

By taking into consideration the natural conditions in the Philippines, such as the typhoons that frequently occur every year, the tropical climate, and the area characteristics of Regions II and IV, the Basic Design shall be prepared as follows:

1. The design must be prepared with emphasis placed on typhoon-resistant capabilities.

   Every year the Philippines suffers from the effects of typhoons. School facilities in Regions II and IV in the Project Area were severely damaged by typhoons. The schoolbuildings to be built under the Project will be used as places of refuge for the area residents. The buildings must therefore by designed to be typhoon resistant structures that will last for many years. There is no need for these buildings to be of high-grade quality nor have elaborate decorative designs.

2. Examination of the Natural Environment and Meteorological Conditions.

The Philippines has a tropical climate; its annual average temperature is 26 to 27°C. The schoolbuildings, as a general principle, shall be designed to have large openings for natural ventilation purposes.

To provide comfortable classroom environment, electrical wiring for fan installation (fans to be installed by the Philippine side) shall be planned.

Open corridors with roofs should be built to offer students and teachers shelter when moving from classroom to classroom on rainy days. The corridors shall be designed to prevent raindrop splashes, mud, and dirt from entering.

Some schoolbuildings will be built near seasides. For the design of these buildings, the probability of salt damage must be taken into consideration.

During the field survey period, some schoolbuildings were found to have termite damage. During the design stage, antitermite treatment of wooden portions must be considered.

The annual rainfall of 1989 in Regions II and IV was 1,616 mm and 1,850 mm respectively. In these regions, it will be necessary to consider taking measures against flooding, such as the adoption of elevated foundations.

As a general principle, natural lighting must be fully utilized. Electric lighting shall only be used on occasions when classes are conducted during dark, rainy days. To obtain sufficient natural light 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 the lighting efficiency.

2) Design Policies for Social Conditions

The design shall be prepared by respecting the Philippines' school facility design standards and by taking into consideration the living mode of the people.

In the Philippines, school facilities are not only used for children's education but for the meeting places for area residents, and as places of refuge during calamities. Therefore, to create larger spaces, movable partitions must be designed for installation between classrooms.

By taking into account the possibility that double-shift classes or meetings may take place at night, all schoolbuildings shall be designed to have lighting systems.

According to the Philippines' accessibility laws, Batas Pambansa Bilang 344, the installation of sloped accesses and special toilets for handicapped students shall be planned. Furthermore, by considering students' safety, round-shaped columns shall be used for corridor structures and the use of independent columns in classrooms shall be avoided.

3) Design Policies for the Situations of Local Construction Field

In the Philippines, there is the National Building Code that corresponds to the Building Design Standards in Japan. Similar to Japan, it is necessary to obtain various permits by submitting formal applications to start building construction.

There are some high level local construction contractors and consultant firms. A careful screening would be necessary prior to hiring them as subcontractors.

A number of construction workers are available in the Philippines. However, it would be necessary to dispatch engineers from Japan to supervise the construction of prefabricated structures. The work skill level of local construction workers is equal to that found in other Southeast Asian countries, such as Thailand, Indonesia, etc. With proper guidance, the workers can accomplish a high level of work.

For Project construction, it would be necessary to secure a sufficient number of skilled laborers for each construction item and for each construction stage.

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

The levels of local construction contractors and consultant firms are high. Use of local contractors for building construction, finish work, and facility installation will be possible. If technical manuals are provided, local consultants will be able to assist in supervising construction work.

Except for the prefabricated materials required for securing the typhoon-resisting capabilities of Project schoolbuildings, Project use materials and equipment shall be procured locally for the purpose of easy maintenance and management of school facilities after Project completion. Most of the necessary materials and equipment are available in Regions II and IV. Some items that are required to be of higher grade or are needed in greater quantities than are available in Regions II and IV will be procured in Manila.

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

By taking into consideration the Philippine Governments financial difficulties, building structures shall be planned by giving top priority to a maintenance-free concept to allow minimum maintenance and management costs and easy maintenance and management after completing Project facilities. Furthermore, consideration shall be given to the use of local materials, except prefabricated materials, for effecting easy repairs to damaged or deteriorated facilities.

6) Design Policies for Scope and Level of Project Facilities and Equipment to be Provided

The contents of the Project include the construction of classrooms and toilets for primary schools and classrooms, science laboratories, and toilets for secondary schools. These facilities will provide basic educational spaces and they should be designed to be comfortable for daily class activities. For the design, emphasis shall be placed not only on their looks but on their quality and quantity. They should be designed not only for class use but for multipurpose use such as the places of refuge during natural calamities.

The equipment plan shall be made to provide basic units necessary for

classroom activities. By considering the use frequencies of equipment units for daily classroom activities, practicality and durability shall be emphasized when preparing the design.

7) Design Policies for Project Construction Period

The Project is to construct 72 primary and secondary schoolbuildings scattering in Regions II and IV which stretches approximately 530 km in a north-south direction. The construction work must be completed within the limited time span.

An effective Project construction plan shall be carefully prepared -- the construction of building foundations and toilets may be undertaken while the prefabricated materials are being manufactured in Japan.

As there will be many schoolbuilding under construction at the same time, the entire Project Area will be divided into eight area and the Project construction in each area will be carried out by one work group.

4-2 Examination of Design Criteria

To meet various site conditions and the size and classroom necessity of each Project school, four types of schoolbuildings were designed. Each one of them was adopted according to each school's classroom shortage situation and site condition.

Optimum room sizes were decided upon by referencing the Philippines' design standards and Japanese design standards. For reducing costs, it is extremely important to establish appropriate prefabricated unit sizes and shorten the construction period.

By taking into consideration the number of students to be assigned in each class and the furniture arrangement, a classroom size was decided upon as being 8 m x 6.25 m (54 m^2) and a science laboratory as being 8 m x 11.25 m (90 m^2).

Toilets are planned according to local building methods as described in DECS's improved specifications. A toilet for males is 11.875 m^2 and one for females is 13.625 m^2.

The features of Project schoolbuildings are shown in Table 4-1.

Table 4-1 Features of Project Schoolbuildings

Building Type	Name of Room	No. of Units	Area (m²)	Remarks
· Primary School Type B	Classrooms	3	162	40 students per room
	Toilet(Male)	1	11.875	
	Toilet(Fenale)	1	13.625	
Subtotal			187.5m²	For 1 school
Total			2,437.5m²	13 schools 1,560 students
· Primary School Type C	Classrooms	4	216	40 students per room
	Toilet(Male)	1	11.875	
	Toilet(Fenale)	1	13.625	
Subtotal			241.5m²	For 1 school
Total			2,173.5m²	9 schools 1,440 students
Total Floor Area of Primary Schools:			4,611.0m²	22 schools 3,000 students

Building Type	Name of Room	No. of Units	Area (m²)	Remarks
· Secondary School Type SA	Classrooms	2	108	42 students per room
	Science Lab	1	90	
	Toilet(Male)	1	11.875	
	Toilet(Female)	1	13.625	
Subtotal			223.5m²	For 1 school
Total			223.5m²	1 schools 84 students
· Secondary School Type SB	Classrooms	3	162	42 students per room
	Science Lab	1	90	
	Toilet(Male)	1	11.875	
	Toilet(Female)	1	13.625	
Subtotal			277.5m²	For 1 school
Total			3,607.5m²	13 school 1,638 students
· Secondary School Type SC	Classrooms	4	216	42 students per room
	Science Lab	1	90	
	Toilet(Male)	1	11.875	
	Toilet(Female)	1	13.625	
Subtotal			331.5m²	For 1 school
Total			7,293.0m²	22 schools 3,696 students
· Secondary School Type SD	Classrooms	5	270	42 students per room
	Science Lab	1	90	
	Toilet(Male)	1	11.875	
	Toilet(Female)	1	13.625	
Subtotal			385.5m²	For 1 school
Total			5,397.0m²	14 schools 2,940 students
Total Floor Area of Secondary Schools:			16,521.0m²	50 schools 8,358 students

4-3 Basic Plan

4-3-1 Site and Layout 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 movement of people 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) To utilize natural ventilation, a new building shall be arranged by taking into account the prevailing wind direction. Furthermore, the building arrangements shall be made by considering the distance from the distance between the existing building and the new building for allowing drafts to pass between them and for avoiding 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) A new building shall be arranged as not to adversely affect existing facilities. The building shall be arranged to allow for the economical installation of facilities and electrical supply lines.

6) Different types of structures shall not be arranged continuously. The toilet facility shall be built separate from the prefabricated main structure. New facilities shall be arranged by taking into account the movement of people so that they will be functional together with the existing facilities.

4-3-2 Architectual Design

a. Floor Plan

When the prefabricated unit construction method is used, the

setting of the adequate size 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 x 8 m. The Japanese standard is about the same and the classroom size is appropriate.

For Project schoolbuildings, the minimum size of the module was decided upon as being 2.25 m wide, and classrooms as 8 m x 6.75 m (2.25 m x 3) and science laboratories as 8 m x 11.25 m (2.25 m x 5).

The toilets that are to be built based on Philippine standards shall be arranged separate from the prefabricated main structure. Taking into account odor problems, the toilets will be located away from other buildings.

Science laboratories shall be arranged to keep water supply and drain pipe installation work to a minimum. All Project buildings shall be arranged from the viewpoint of overall school facility use.

By taking into consideration the Project site areas' population, the number of students, the environmental conditions, and the condition of existing buildings, the floor plans of the four basic buildings and the science laboratory were prepared.

Each school's arrangement plan shall be made to suit the needs of the school and area conditions by using these floor plans.

An open corridor is designed to allow teachers and students to move easily between classrooms.

A comparison of Project facility features to those having Philippine standard is given in Table 4-2.

Table 4-2 Comparison of Project Facility Features to Those Having Philippine Standards

	Name of Room	Philippine Standard	Project Facility Standard	Difference
PRIMARY SCHOOL	Classroom	1.2 m²/student (minimum requirement)* but actual figure is 1.17m²/student	1.35m²/student (40 student/class)	· Typhoon-resisting capability · Unit area per student was increased to meet possible future inrcease of students per class-room · Sliding partition is adopted to permit combining two class-room. · Major structure is maintenance free type · High ceilings are adopted to allow natural ventilation
	Toilet	One urinal per 50 males. Two urinals for additional 100 males. One toilet bowl per 50 students. One sink per one toilet bowl. One water faucet per two classrooms.	Male Toilet: · One handicapped person use. · One urinal (4 persons use). · One sink with pail. Female Toilet: · One handicapped person use. · Two toilet bowls. · One sink with pail.	· Abopted Philippine Standard, but added handicapped person use toilet units
	Corridor	No rule exists for the outside corridor. 2.0m wide for inside hallway for a school having less than 500 students.	1.5m wide for outside corridor	· Similar to Philippine Standards

	Name of Room	Philippine Standard	Project Facility Standard	Reference
SECONDARY SCHOOL	Classroom	1.4 ㎡/student (minimum requirement) but actual figure is 1.11㎡/student	1.28㎡/student (42 students/ class)	· Same as for Primary Schools · Unit area per student is slightly smaller than Philippine standard, but one classroom can accommodate 42 students.
	Science Laboratory	2.4 ㎡/student (minimum requirement)	2.14㎡/student (42 students/ class)	· Typhoon-resisting capability · Designed to install one steel shelf unit in each laboratory. · Designed to install one sink unit for experiment
	Toilet	Same as primary school standards	Same as primary school standards	Same as Philippine Standards, but added handicapped person use toilet units
	Corridor	Same as primary school standards	Same as primary school standards	Similar to Philippine Standards

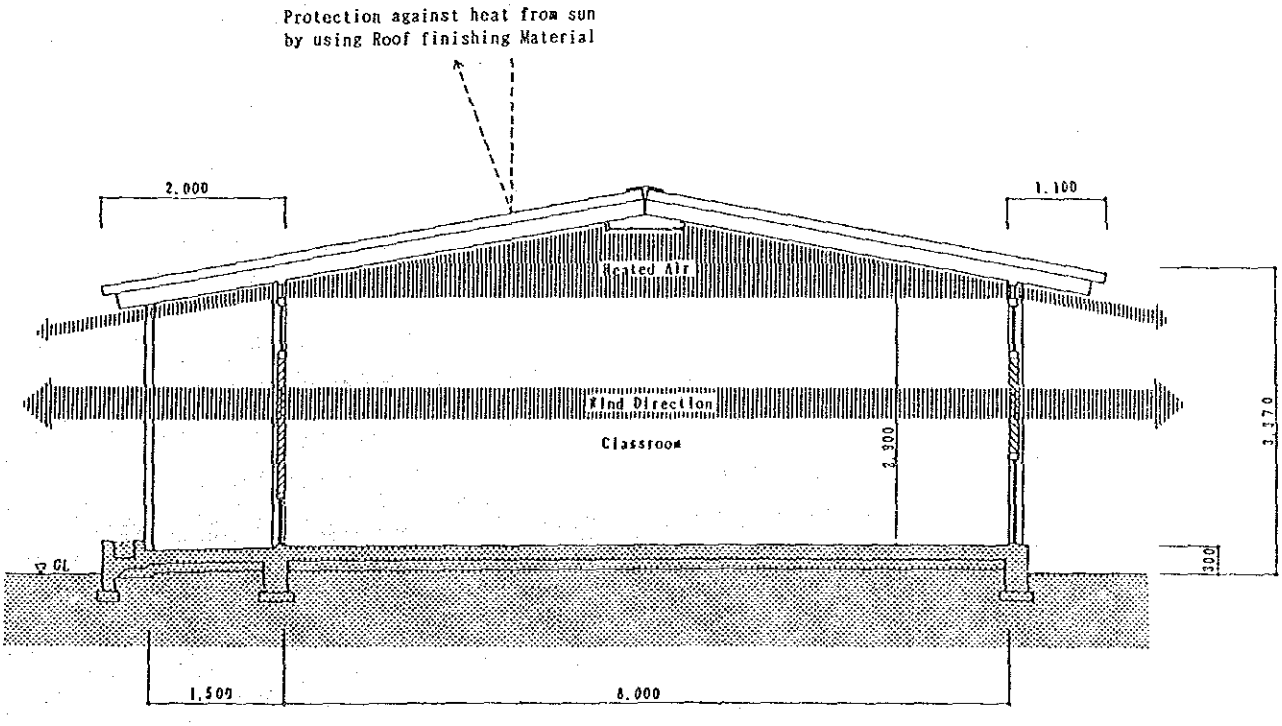
b. Section Plan

During the Phase II project design period, DECS requested changing door heights from 1.8 m to 2.0 m. Thus, the door height was designed as 2.0 m and, according, the division of the exterior wall panel and the jalousie window was altered.

As a general principle, the section plan for the Phase III Project followed the one for the Phase II project. By taking into consideration the tropical climate of the Philippines, the graded ceiling was adopted to keep the air stratum as thick as possible above the classroom.

The length of the eaves was decided upon from the viewpoint of the effects of intercepting 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 0.5 m from the columns to the tip of the eaves. Eaves on the other side of the building are to be 1.1 m long. The standard section of Project buildings are shown in Fig. 4-1.

Fig. 4-1 Standard Section



c. Structure Plan

1. Basic Requirements

The main purpose of the Project is to restore or rebuild 72 schoolbuilding that were damaged by large typhoons in Regions II and IV. The following three aspects specifically required for the Phase III Project's structure plan were also applicable in the Phase I and Phase II projects:

(1) Typhoon-resistant capabilities
(2) Durability
(3) Short construction period

Based on the experience gained during the Phase I and Phase II projects, steel-frame prefabricated panel structures are thought to be most suitable for meeting the above requirements. The panel units are to be fabricated with factory made steel frames. The panel units made in Japan will be shipped to each Project site and assembled there to make a permanent structure. By using this method , construction quality control and a short construction period can be accomplished.

From the viewpoint of the above concept, the structure plan was made to ensure the typhoon-resistant capabilities and durability of the buildings as follows:

2. Design Policies

a) Design Loads and External forces

Basically, the National structural Code of the Philippines was used to determine the design loads for Project schoolbuildings. From the viewpoint of typhoon-resistant 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 Interpretation" published

by the Japan Society of Architects specifies the external force factors for local wind forces. The Philippine Code does not specify the local wind force for building design. However, the design load condition equivalent to that specified by the Japanese 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 in 1975" published by the Japan society of Architects. Typhoon No.13 was about the same scale as the typhoons that caused extensive damages in the Project Area in 1987. Many similarities were found between the above record and the recorded damages in the Philippines. Therefore, the design loads for Project schoolbuildings were decided upon after carefully examining the above publication.

b) Building Structure Plan

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

(1) Vertical external forces (fixed loads, live loads on roofs) will be taken by the prefabricated module unit (8 m x 2.25 m 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 frames and the fixed-partition walls, and the rigid frames of each module unit.

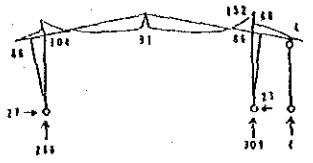
(3) Beam direction horizontal external forces (wind forces and seismic forces) will be taken by the rigidity of the wall panels. In general, the beam direction of steel frame structures is the weaker structure direction against horizontal external forces. Therefore, vertical bracings are used to take the external forces.

From an esthetic viewpoint, the exposed vertical bracings are not desirable. Thus, the external forces will be taken by the internal rigidity of the wall panels instead of installing vertical bracings.

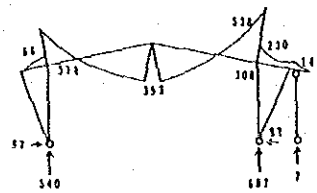
Mat foundations will be constructed around the buildings. The thickness and reinforcement of the foundations will be decided upon to suit the condition of each Project school site. For example, according to the Building Damages in Hachijo Island Caused by Typhoon No. 13 in 1975, it was reported that wind forces lifted buildings from their concrete block foundations.

For Project schoolbuildings, the large lifting forces of winds and the column pulling forces by an overturning moment acting on the schoolbuildings may occur. Special attention shall be paid to the method of fixing building structures to foundations.

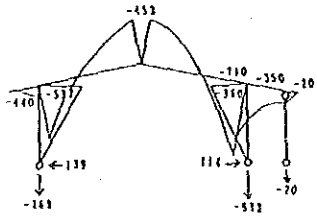
The results of the stress analyses of the rigid frame structure against beam direction horizontal external forces are shown below.



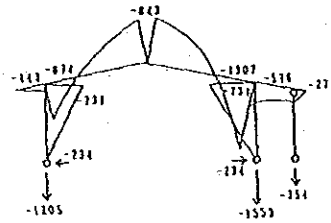
Fixed load



Roof Area Live Load



Wind Load
(Open Windward and Leeward)



Wind Load
(Only Windward Open)
* Vertical Component Only

Unit: kg·m

c) Design of Each Structure Member

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

. Eaves and Roof ridges:

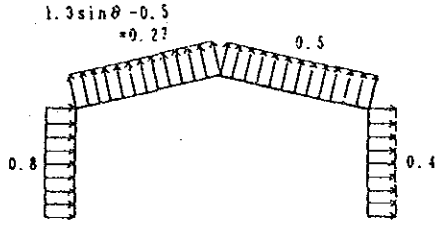
During the field survey period, in particular, many damaged eaves and roof ridges were observed. Special attention must be paid when designing these building parts because they will receive the impact from

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 for reinforcing eaves and roof ridges is to utilize deform preventive materials.

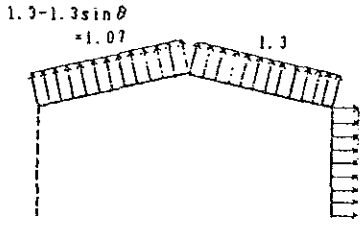
The installation of these members shall be taken into consideration in the detailed design of Project buildings.

. Wall Panel's Strength Against External Forces:

"The Building Damages in Hachijo Island Caused by Typhoon No. 13 in 1975" reported on the damaged buildings whose roofs were completely blown away by the lifting wind forces 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:



Closed



Open Windward

As the above figure shows, the failure of walls will create enormous wind forces in the building which might result in its complete destruction. Thus, it is necessary to pay special attention to wall panel strength against external forces. Since it is planned to utilize removable wooden jalousies that are 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.

d. Building Facility Plan

(1) Electrical Facility Plan

Electrical facilities are planned to be installed in all Phase III Project schools. All materials for the electrical facilities will be procured in the Philippines.

Lighting fixtures, outlets, and fans will be installed. For fan installation, electrical wiring and switches will be installed -- fan units will be installed by the Philippine side.

The designed number of fluorescent lighting fixtures, ceiling fans, switches and outlets for each room are shown in Table 4-3.

Table 4-3 The Designed Number of Fluorescent Lighting Fixtures, Ceiling Fans, Switches, and Outlets for Each Room

Type of Room	Number of Units			
	Fluorescent Lighting Fixtures	Ceiling Fans	Switches	Outlets
Classroom	4	2	2	4
Science Laboratory	6	3	3	6
Toilets for Males	2	0	1	0
Toilets for Females	2	0	1	0

(2) Water Supply Facility Plan

The same as for the Phase I and II projects, pipe supply or well water will be lifted by electric power or manual pumps into 4 m high elevated tanks. The water will then be supplied to the wash basins in toilets, water closets, urinals, and the science laboratory sinks by gravity flow.

The water supply facility includes the following items:

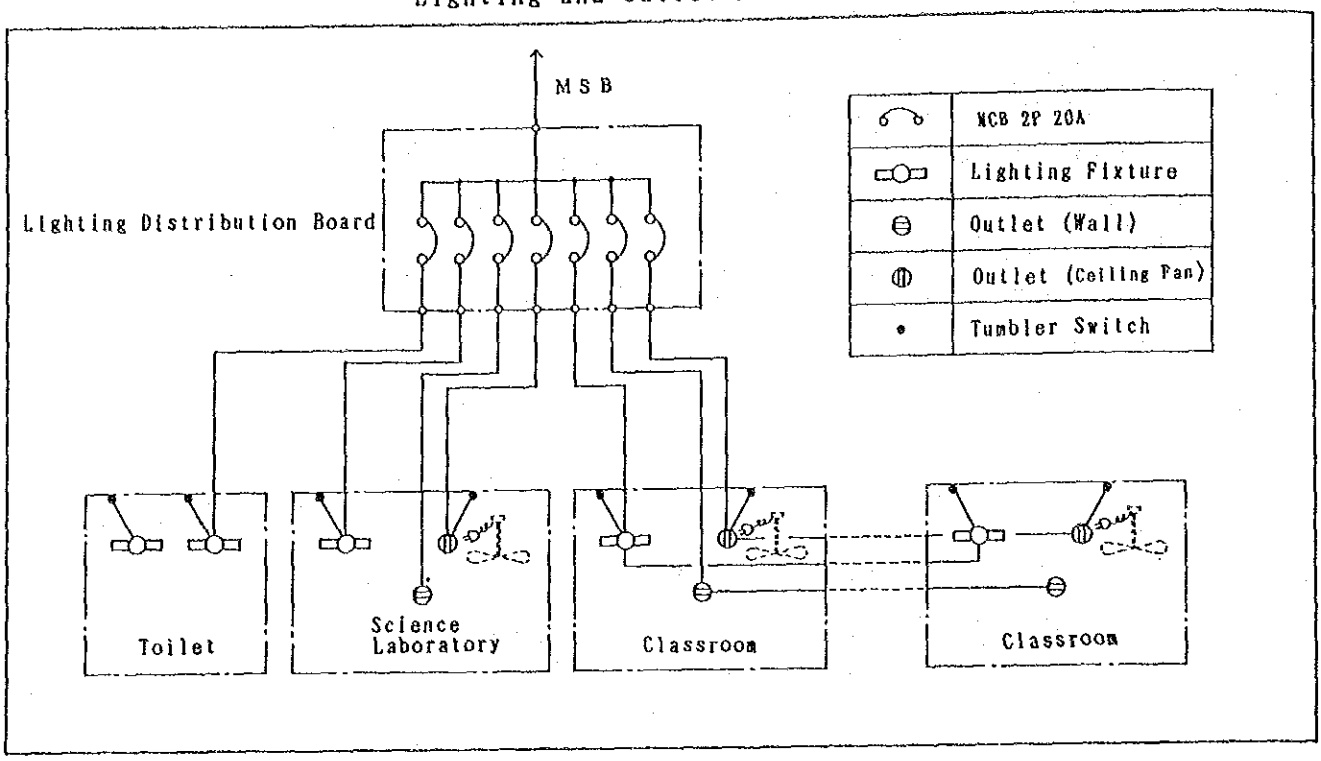
. Elevated tanks:	F.R.P. tanks, 2.0 m^3 capacity
. Supporting structures:	Fabricated with steel angle bar
. Pumps:	Motor operated pumps and hand pumps (for schools having no power supply)
. Piping material:	PVC pipe and ductile iron pipe for tank connection portions.

(3) Sewerage Facility Plan

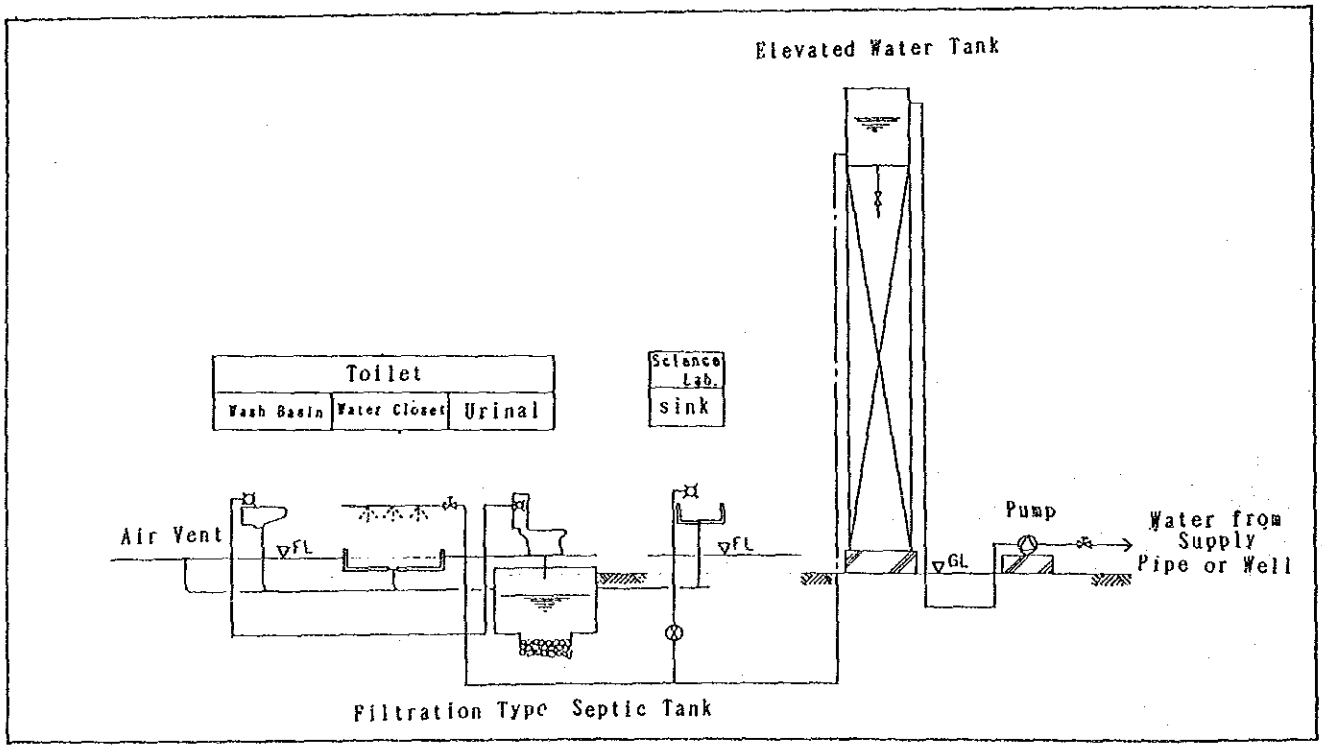
It will be necessary to install sewage treatment facilities for sewage from toilet wash basins, urinals, and water closets, and water from the sinks in the science laboratories. It is designed to treat sewage and waste water by simple infiltration type septic tanks. The sewerage facility includes the following items:

. Water closets:	Western type
. Urinals:	Multiple unit type, tiled
. Wash basing:	China
. Piping material:	PVC pipe
. Septic Tanks:	Infiltration type, made of reinforced concrete

Lighting and Outlet Wiring Diagram



Water Supply and Sewerage System Diagram



e. Schoolbuilding Material Plan

1. Basic Requirements

As in the Phase II Project, in view of durability and short construction period requirements, prefabricated materials procured in Japan, such as steel structure, and roofing materials, the long sandwiched insulated panels are adopted for the Project. Since no problems are foreseen in the use of local materials for the interior walls, local dressed plywood is to be used as the finish material of interior walls and ceilings and colored mortar cement for interior floor.

2. Major Materials to be Used

a) Structure Material

Weatherproof, lightweight shaped steel that provides longer life than regular steel is to be used for the main members of buildings.

b) Roofing Material

Most of the schools in the Philippines are roofed with zinc plated sheets. Unfortunately, most of them are corroded. Thus, aluminum-zinc alloy plated steel sheets that have a stronger anti-corrosion resistance than zinc Plated steel sheets were selected. Also, uncoated aluminum-zinc alloy plated steel sheets have a better capability to reflect sunshine than the zinc plated steel sheets. It is expected that the selected roofing material will be helpful in preventing temperature rises in the rooms.

c) Windows

Sliding glass windows that are used extensively in Japan are rarely found in Philippine primary and secondary schoolbuildings -- wooden jalousies are most commonly used in the Philippines. Wooden jalousies are unique, ingenious contrivances that utilizes the merits of non-shattering, easily maintainable and manageable wood and yet allows

jalousies for the schoolbuildings; they are suitable for the Philippine environment.

d) Walls and Ceilings

It was decided to use long insulation sandwich panels for exterior wall material by taking into account their high insulating qualities. Local dressed plywood will be used for partition walls and ceilings. Some movable walls are designed for Project schoolbuildings. Since the movable walls require highly accurate finish work, they are to be procured in Japan.

The finish materials to be used for Project schoolbuildings are listed in Table 4-4.

Table 4-4 Finish Materials to be Used for Project Schoolbuildings

EXTERIOR	PHILIPPINE METHOD	THIS PROJECT'S METHOD	REASON FOR ADOPTION
Roofs	Zinc plated corrugated steel sheets	Aluminum-zinc alloy plated steel sheets	Stronger anti-corrosion resistance
Roof edges	No underlay, O.S. finish	Waterproof plywood. S.O.P. coating	Easy maintenance and adoption of local material
Walls	Concrete blocks. mortar finish	Long-sized insulating sandwich panels	Insulating effect
Windows	Wooden jalousies coated with S.O.P.	Wooden jalousies coated with S.O.P.	Easy maintenance
Doors	Wooden doors	Wooden doors coated with S.O.P.	Durability and easy maintenance
Baseboards	Cement mortar steel trowel finish	Cement mortar steel trowel finish	Durability and easy maintenance
Corridor Floors	Cement mortar steel trowel finish	Cement mortar steel trowel finish	Durability and easy maintenance
Septic tanks	Reinforced Concrete particially made of concerete blocks	Concrete block made (inside, and outside tank tops are to be waterproof mortar steel trowel finish)	Durability and easy maintenance

EXTERIOR	PHILIPPINE METHOD	THIS PROJECT'S METHOD	REASON FOR ADOPTION
Classrooms and Science Laboratories			
Floors	Reinforced concrete, mortar finish	Colored cement mortar steel trowel finish	Durability
Walls	Concrete blocks, mortar finish	Partion walls-- decorative plywood S.O.P. Side plank--long-sized insulating sandwich panels	Durability, insulating effect, easy construction, and adoption of local materials
Ceilings	No ceiling, O.S. finish(truss structures)	Decorative plywood	Easy to install
Other parts		Work benches with sinks 100 mm tiled tops (science laboratories only) Dadoes-- CHB mortar, E.P. coating	Easy maintenance and accurate finish work
Male and Female Toilets			
Floors	Local mosaic tiles	Mortar, steel trowel finish	Easy maintenance
Walls	Concrete blocks, V.P. laying	Concrete blocks, V.P. laying	Easy maintenance
Ceiling	No ceiling, O.S.finish	No ceiling, O.S.finish	Easy maintenance

4-3-3 Equipment Plan

In order to fulfill the education conditions after the opening of the Project schools, proper accommodations must be installed. Upon completion of the classrooms, science laboratories, and toilets in the Project schools, various types of equipment will be used.

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

For the science laboratories, three-person type tables were decided upon. One workbench (to be used for teacher demonstrations) will be installed in each of the science laboratories. Judging from the purposes for which they are to be used, it was planned to provide practical, strong equipment; elaborate equipment was avoided.

The equipment types and number of units to be provided for each Project school classroom are shown in Table 4-5. The equipment types and number of units to be provided for each different size Project school are shown in Table 4-6.

Table 4-5 Equipment Types and Number of Units to be Provided for Each Project School Classroom

Primary Schools

Name of Room	Name of Item	No. of Units for One Room
Classroom	• Teacher's desk	1
	• Teacher's chair	1
	• Teacher's filling cabinet	1
	• Student's chair-desks (large size)	8
	• Student's chair-desks (medium size)	8
	• Student's chair-desks (small size)	8
	• Student's closets	8
	• Blackboard	1
	• Bulletin board	1

Secondary Schools

Name of Room		No. of Units for One Room
Classroom	• Teacher's desk	1
	• Teacher's chair	1
	• Teacher's filling cabinet	1
	• Student's chair-desks	42
	• Student's closets	8
	• Blackboard	1
	• Bulletin board	1
Science Laboratories	• Experiment tables	14
	• Student's closets	5
	• Demonstration workbench	1
	• Stools (1 for Teacher, 42 for Students)	43
	• Blackboard	1
	• Bulletin board	1
	• Storage shelve	1
	Steel shelve	1

Table 4-6 Equipment Types and Number of Units to be Provided for Each Different Size Project School

Primary Schools

(1 of 2)

Furniture	B Type Three Classrooms (13 schools)		C Type Four Classrooms (9 schools)		For All Primary Schools
	For one school	13 schools	For one school	9 schools	
Teacher's desk	3	39	4	36	75
Teacher's chair	3	39	4	36	75
Teacher's filling cabinet	3	39	4	36	75
Student's chair (Large)	24	312	32	288	600
Student's chair (medium)	24	312	32	288	600
Student's chair (small)	24	312	32	288	600
Armchair					
Student's closet	24	312	32	288	600
Workbench					
Experiment Table					
Stool					
Blackboard	3	39	4	36	75
Bulletin board	3	39	4	36	75
Storage shelf					
Steel shelf					

Table 4-6 (Cont'd)

Secondary Schools

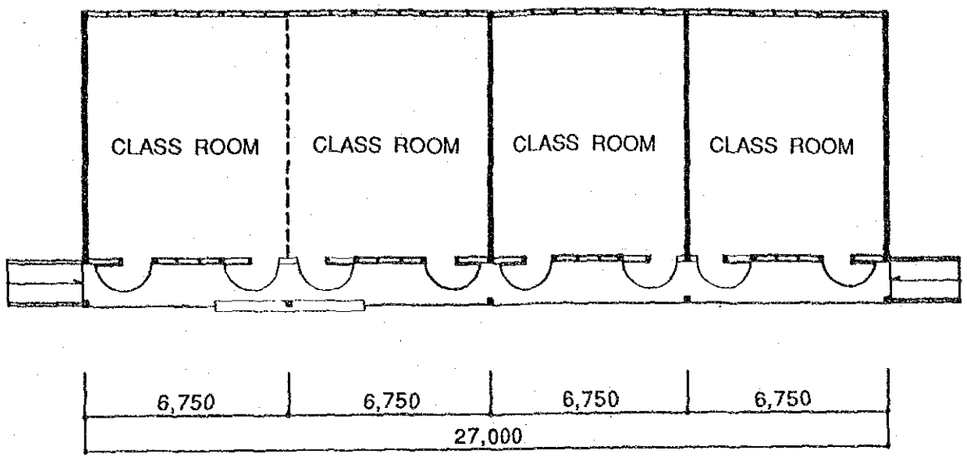
(2 of 2)

Furniture	SA Type Two Classrooms (1 school)		SB Type Three Classrooms (13 schools)		SC Type Four Classrooms (22 schools)		SD Type Four Classrooms (14 schools)		Total of Secondary schools	Total of All Project Schools
	For one school	1 schools	For one school	13 schools	For one school	22 schools	For one school	14 schools		
Teacher's desk	2	2	3	39	4	88	5	70	199	274
Teacher's chair	2	2	3	39	4	88	5	70	199	274
Teacher's filling cabinet	2	2	3	39	4	88	5	70	199	274
Student's chair (Large)										600
Student's chair (Mediun)										600
Student's chair (Small)										600
Armchair	84	84	126	1,630	168	3,696	210	2,940	8,558	8,558
Student's closet	21	21	29	377	37	814	45	630	1,842	2,442
Workbench	14	14	14	182	14	308	14	196	700	882
Experiment Table	1	1	1	13	1	22	1	14	50	50
Stool	43	43	43	559	43	946	43	602	2,150	2,150
Blackboard	3	3	4	52	5	110	5	84	249	324
Bulletin board	3	3	4	52	5	110	5	84	249	324
Storage shelf	1	1	1	13	1	24	1	14	50	50
Steel shelf	1	1	1	13	1	22	1	14	50	50

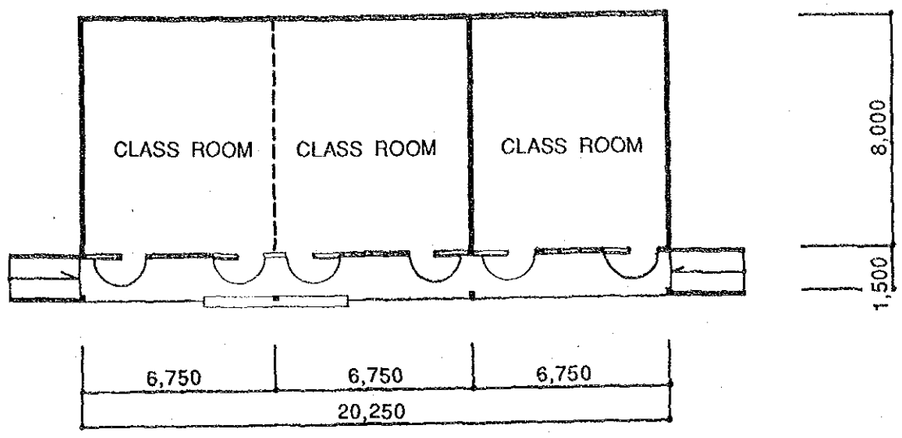
4-3-4 Basic Design Drawings

Drawing List

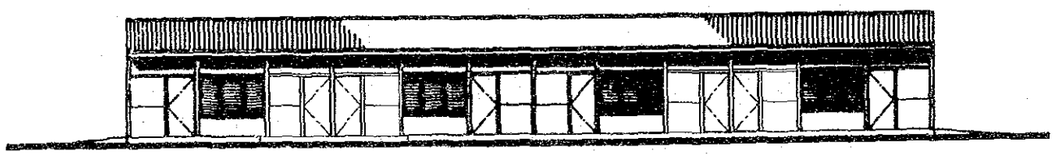
No.	Title
01	Primary School B & C Types: Plans, Elevations, and Sections
02	Secondary School SC Type: Plan, Elevations, and Sections
03	Secondary School SA, SB and SD Types: Plans, Elevation and Section
04	Toilet: Plan, Elevations, and Sections
05	Primary School B and C Types' Equipment Arrangement
06	Secondary School SA, SB, SC, and SD Types' Equipment Arrangement



ELEMENTARY SCHOOL C-TYPE PLAN

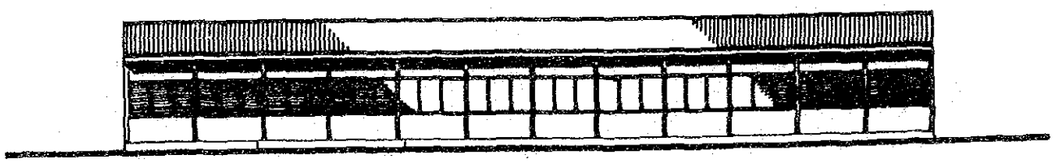


ELEMENTARY SCHOOL B-TYPE PLAN



ELEVATION

ELEVATION



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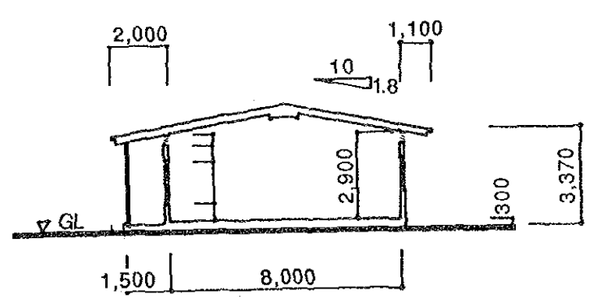

SECTION

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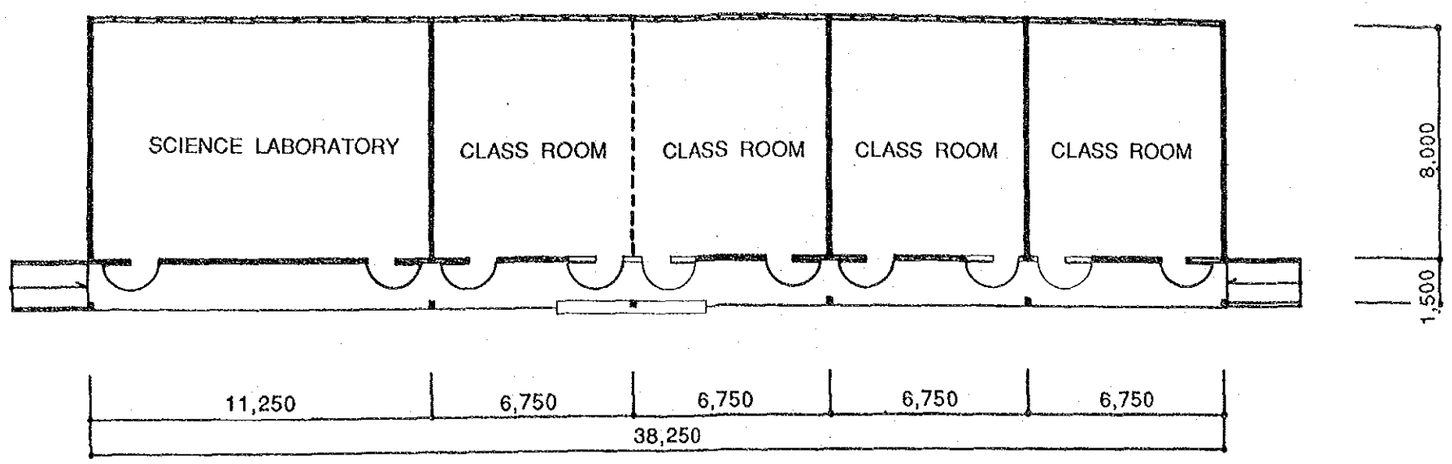
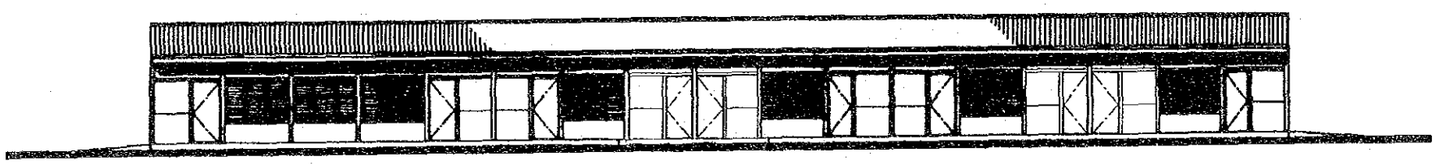


SECONDARY SCHOOL SC-TYPE PLAN



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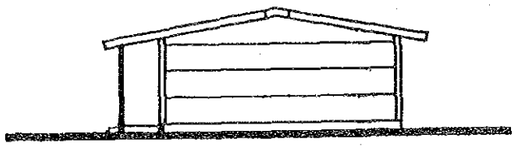

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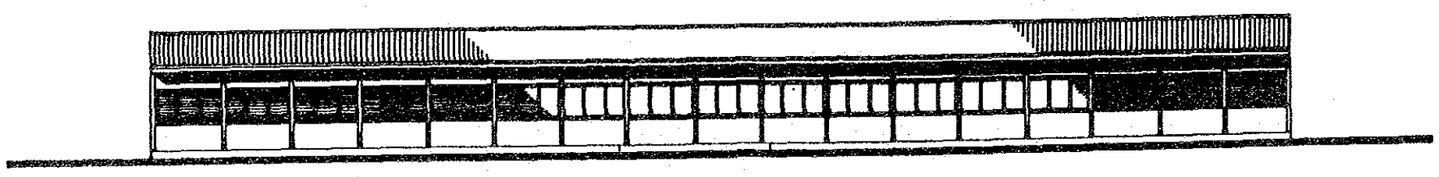

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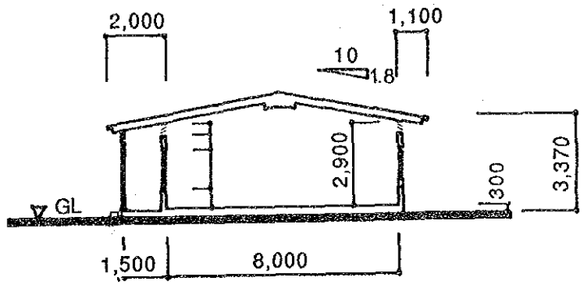

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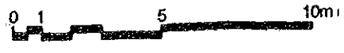

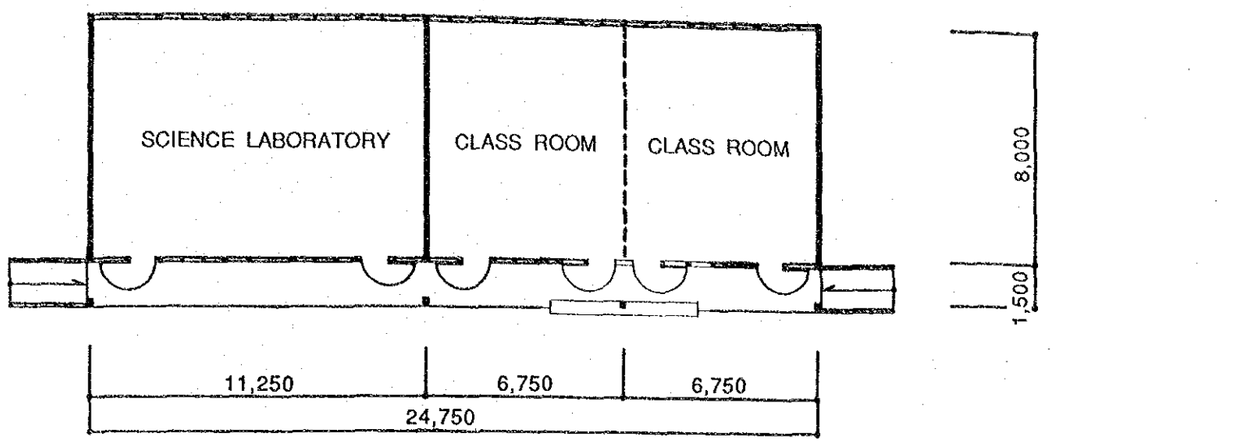

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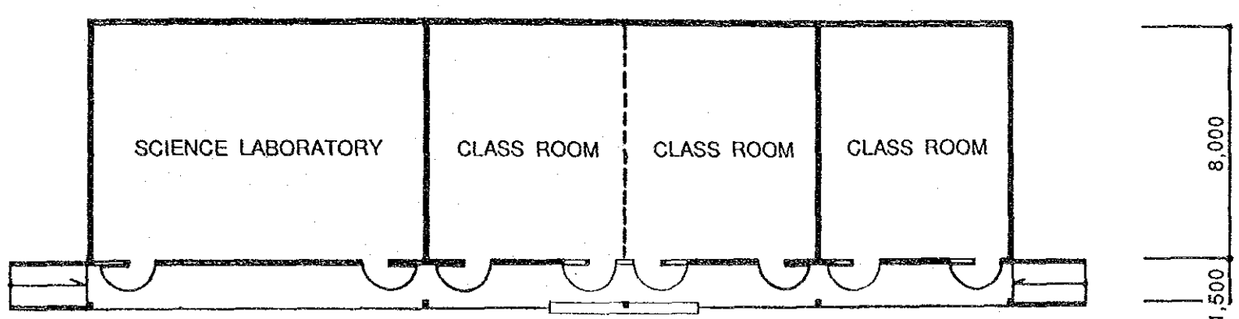

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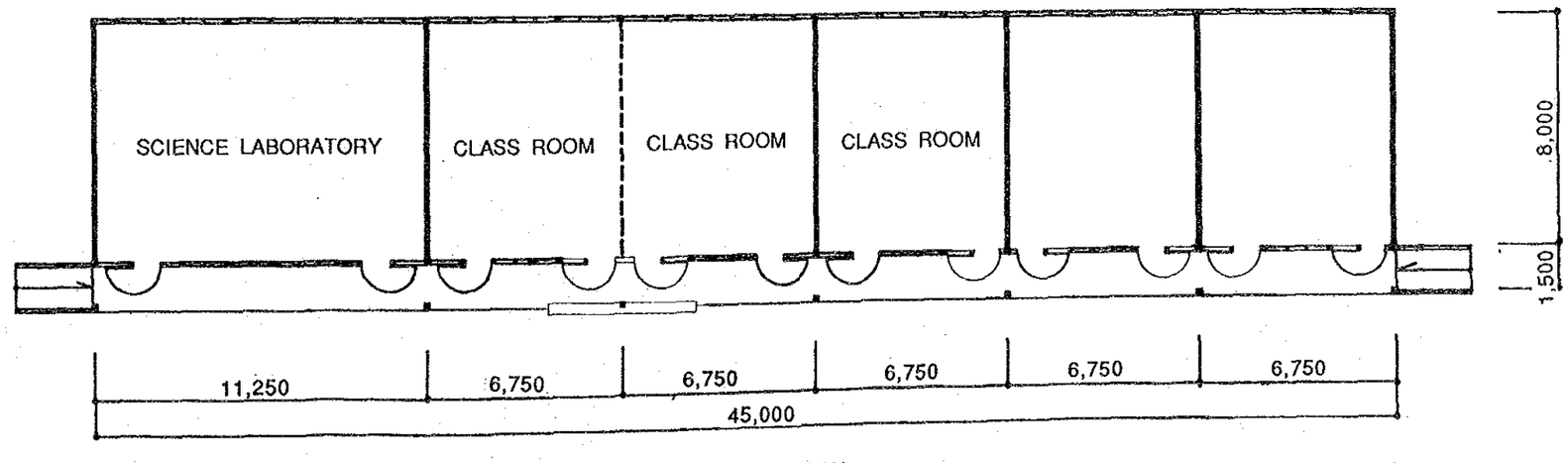

SECONDARY SCHOOL SD-TYPE PLAN

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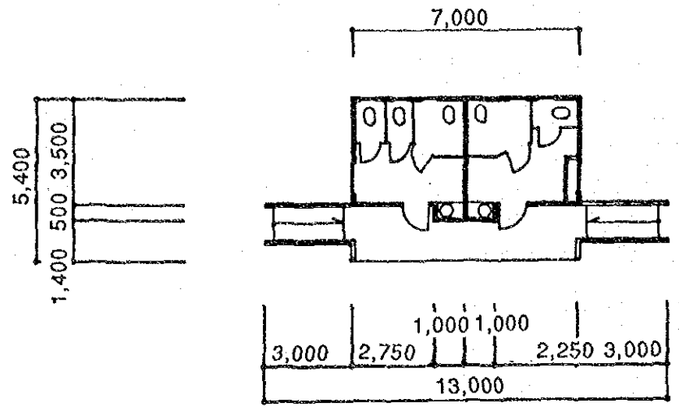
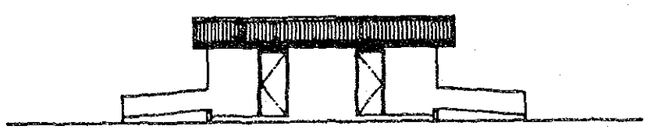


PLAN



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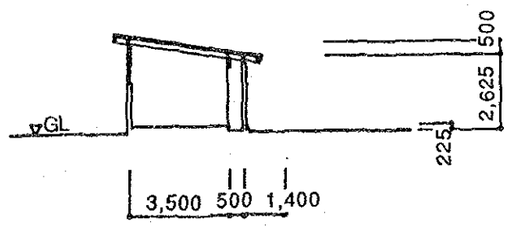

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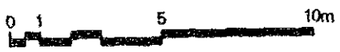
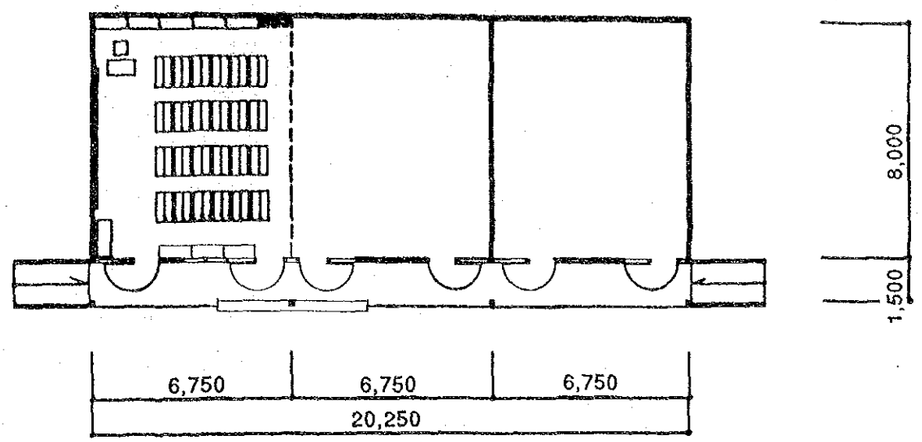
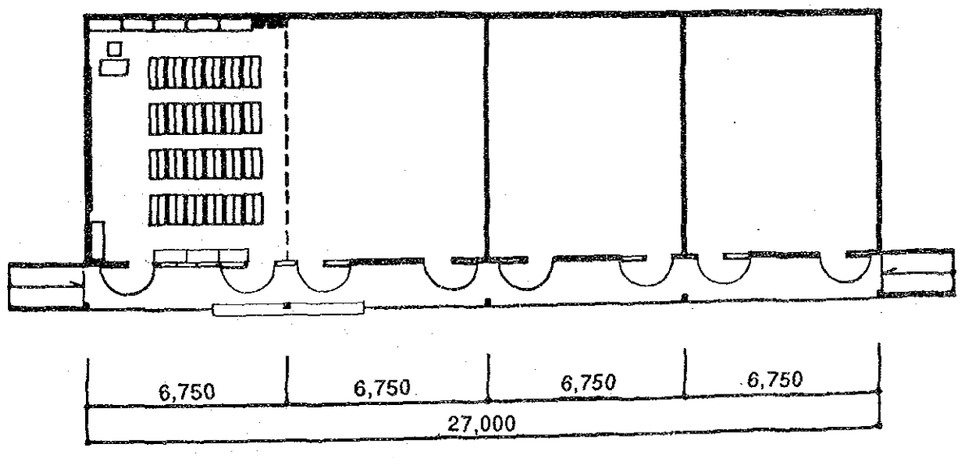




ELEMENTARY SCHOOL B-TYPE EQUIPMENBT PLAN



ELEMENTARY SCHOOL C-TYPE EQUIPMENBT PLAN

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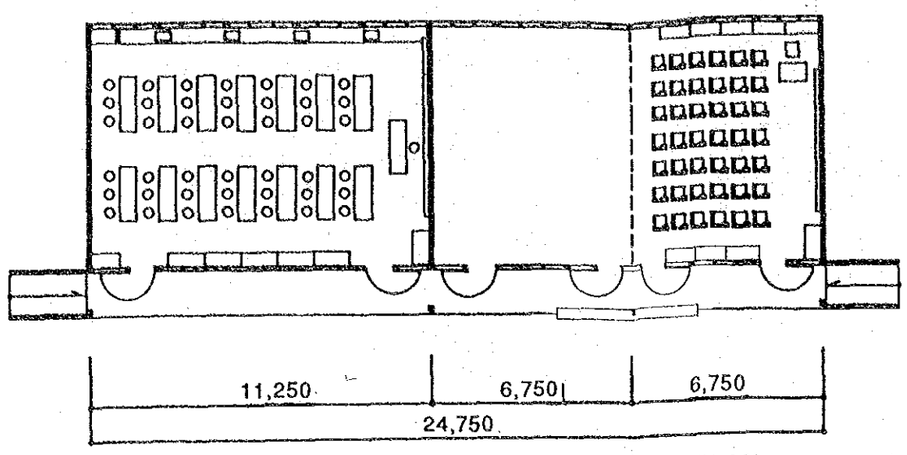
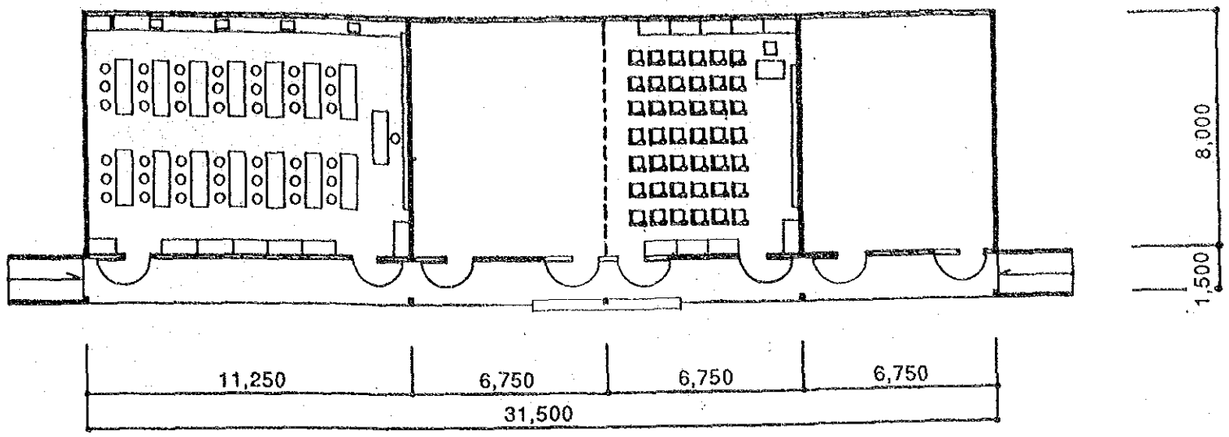
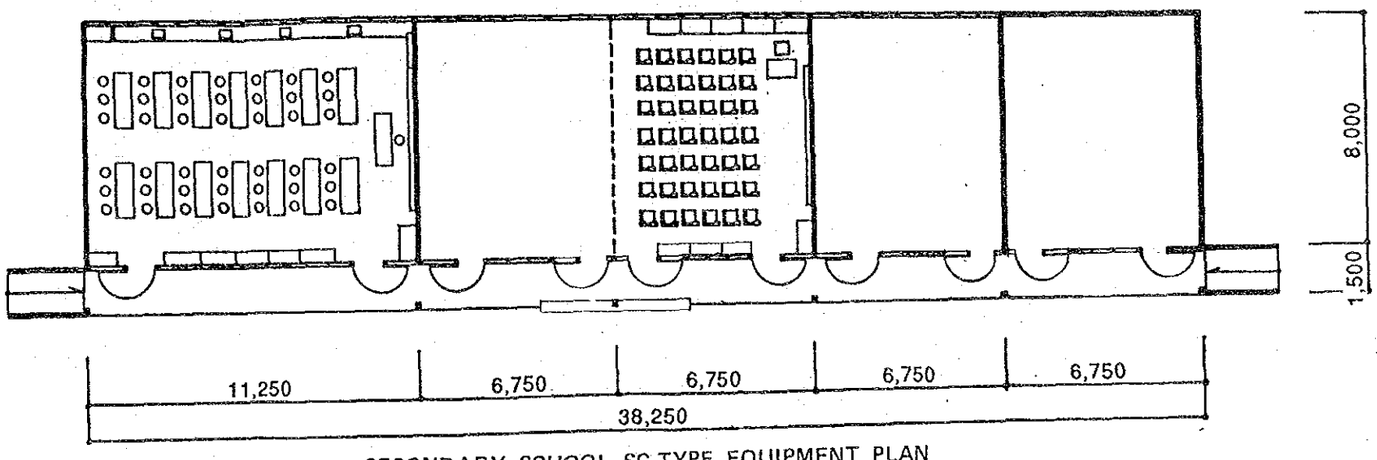


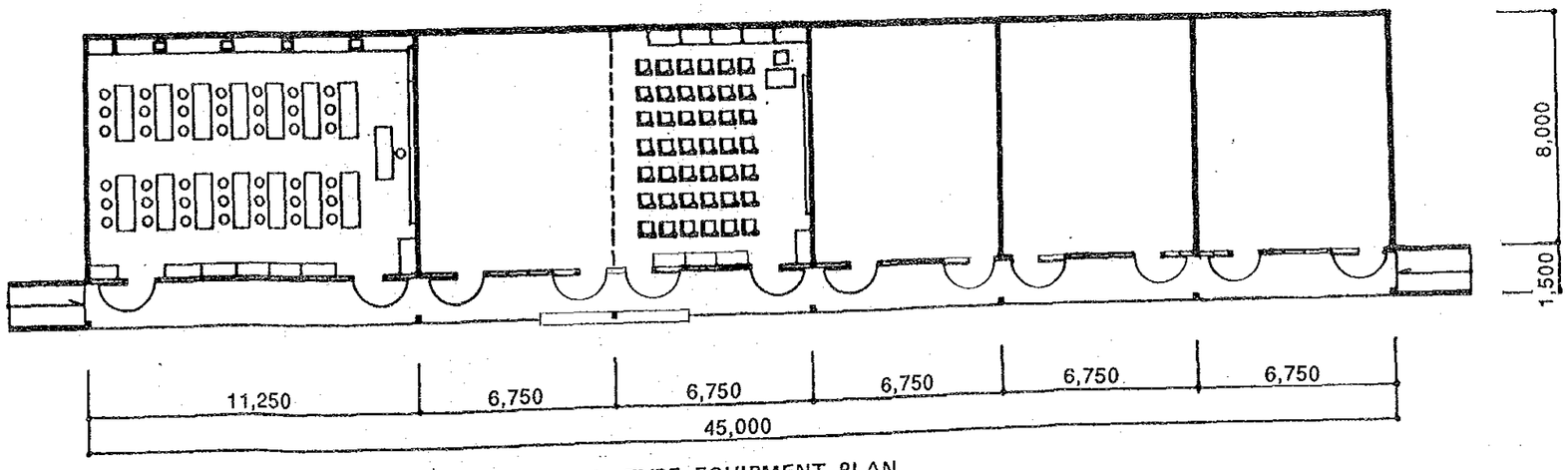
SECONDARY SCHOOL SA-TYPE EQUIPMENT PLAN



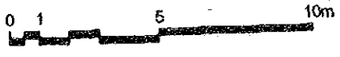
SECONDARY SCHOOL SB-TYPE EQUIPMENT PLAN



SECONDARY SCHOOL SC-TYPE EQUIPMENT PLAN



SECONDARY SCHOOL SD-TYPE EQUIPMENT PLAN



4-4 Implementation Plan

4-4-1 Implementation Method

A peculiarity of the Project is the construction of school facilities at widely scattered sites in Regions II and IV that stretches some 530 km in a north-south direction during a very short period of time. The construction plan must be able to meet this peculiarity.

1) Two schools will be set up as the Project's model schools. One will be in Tuguegarao, the construction base in Region II. The other will be in Batangas, the construction base in Region IV.

   The group-leader class engineers who will carry out the Project construction at each site will be provided with on-the-job training in the following subjects:

   I. The accurate foundation concrete placing method and the method for fixing prefabricated material by anchor bolts. Both of these methods are important in the building of typhoon-resistant schoolbuildings.

   II. Training in prefabricated structure construction methods and finishing methods will be conducted for fourteen days by engineers dispatched from Japan. Actual job experience coupled with the used of the construction manual will be of great value to the engineers when performing future construction work.

2) As construction work will be conducted at various sites simultaneously, the supervisors shall communicate with each other frequently so that the plan can be carried out smoothly.

3) Regarding the construction materials and equipment to be procured in Japan, adequate quality control and inspection should be carried out in Japan to prevent troubles from arising at the construction sites.

4) To guide Japanese contractors in making the technology transfer of prefabricated structure construction techniques to local contractors and workers.

5) The schedule for the foundation construction work should be set up according to the arrival dates of the prefabricated material at the sites.

6) The maintenance of security and the prevention of theft within the construction sites throughout the entire construction period is of utmost importance.

7) As the existing electric power supply to the Project sites is inadequate, small generators will be used. Most of the schools have a water supply. As Project water usage will be small, water for construction purposes will be stored in drum cans or drawn by hand pumps.

8) To ensure the success of Project construction, it will be absolutely necessary to maintain close cooperation with the local contractors. The clarification of the roles of a prime contractor and the subcontractors, and the establishment of an appropriate staff plan should be made for the smooth progress of the construction work.

As described in Section 4-1 (Basic Design Policies), it will be necessary to utilize local consultants and contractors, and dispatched specialists from Japan. The construction management by the Philippine side will be carried out by EDPITAF with the cooperation of DECS and DPWH as explained in the previous sections of this report concerning the Executing Agency and Operational Structure.

4-4-2 Construction Management System

As the seventy-two Project schools are scattered throughout the wide areas of Region II and IV, it is important to have adequate management of the construction schedule and quality control.

The consultant firm and construction contractors should establish the Project construction headquarters in Manila which is located nearly in the center of the Project Area, Regions II and IV. Each region shall be divided into four construction areas. A construction base should be established in

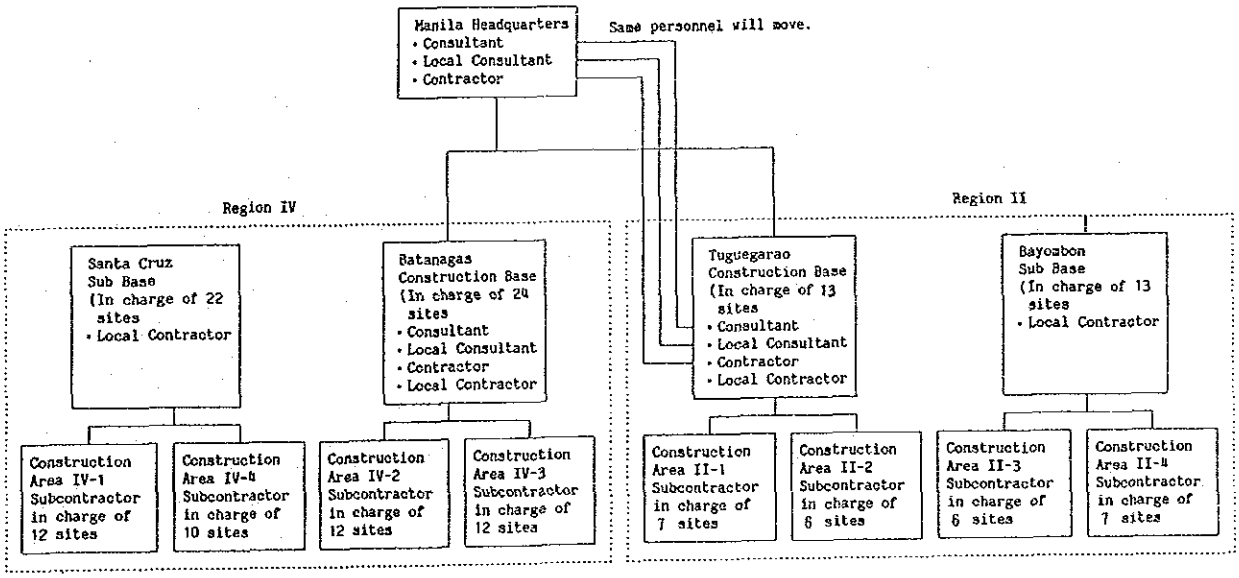
each region to supervise construction work in the areas (Region II's construction base in Tuguegarao City and Region IV's construction base in Batangas City).

To assist the construction bases, two construction sub bases should be set up (one in Bayombong for Region II's construction base and the other in Santa Cruz for Region IV's construction base).

By having construction management bases in five cities, smooth delivery of equipment and materials to each site can be made and the periodic close construction management by consultants, construction contractors and local engineers will be possible.

The Project construction management organization chart is shown in Table 4-7.

Table 4-7 Project Construction Management Organization Chart



4-4-3 Equipment and Material Procurement Plan

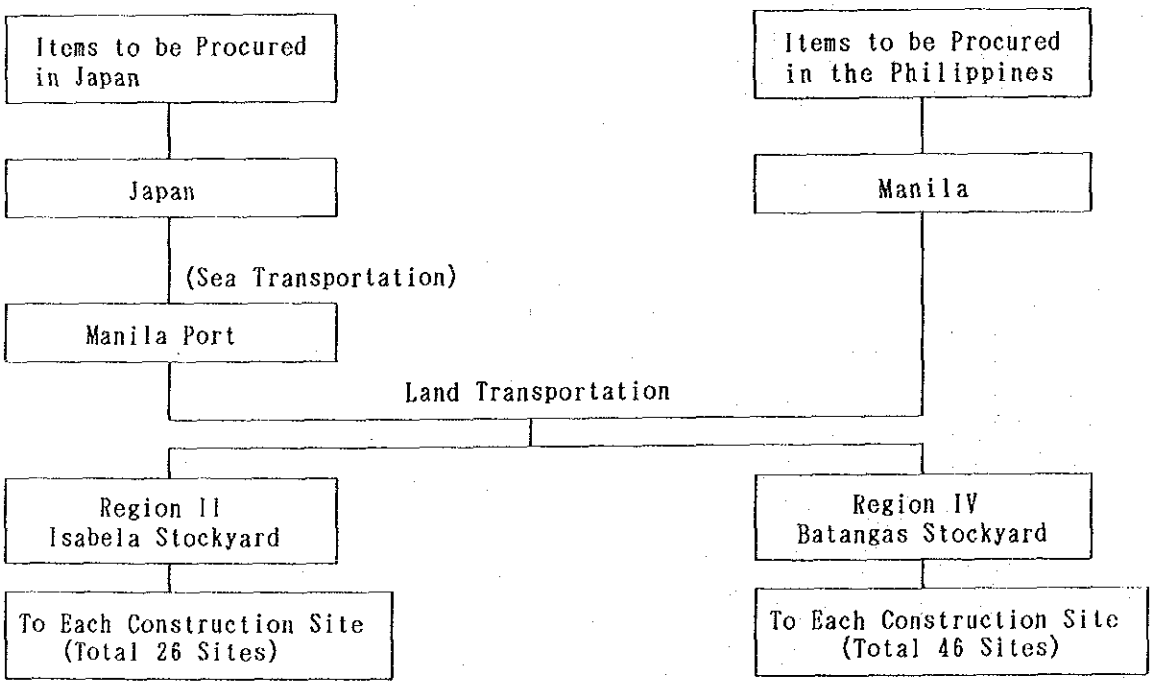
(1) Equipment and Material Procurement Policies

The prefabricated materials needed to secure the Project's typhoon-resisting capabilities will be procured in Japan. Since there are no technical problems concerning local construction materials, such as reinforcing bars, cement, gravel, concrete blocks, etc., and utility fixtures and furniture, they will be procured locally for the sake of easy maintenance and management of school facilities after project completion. Most of these materials and equipment can be procured in each Region. Items requiring to be of higher grade, or are needed in larger quantities than available in each Region, will be obtained in Manila.

There is a sufficient work force available in the Philippines. For work requiring special techniques, such as assembling prefabricated materials, it will be necessary to dispatch the manufacturer's engineers from Japan.

The transportation plan for procured equipment and materials is shown in Table 4-8.

Table 4-8 Transportation Plan for Procured Equipment and Materials



(2) Sea Transportation Plan

By taking into account the economical manufacturing process of almost 16,000 m^3 of prefabricated frames and the progress of the foundation construction work in the Philippines, a sea transportation plan shall be drawn up to provide smooth construction progress during each construction stage.

It is planned to disembark the prefabricated construction material procured in Japan at the Manila International Port. Since the port is the representative international port of the Philippines, the 5,000 to 8,000 ton class ship planned on being used for the Project will have no problem entering.

(3) Inland Transportation Plan

The material and equipment disembarked at the Manila International Port will be transported to each Region's stockyard for temporary storage by heavy vehicles. Although the principal highway is in good condition, there are problems concerning access roads and the allowable loads and widths of bridges. In particular, the failure of a bridge during the rainy season may affect the Project's construction schedule. Various means of transportation, such as using manual labor to carry uncrated materials and equipment should therefore by employed.

To prevent damage during transportation, compact sized wooden crates of from 700 kg to 3 tons should be used. Load heights should be limited to 2 m because many of the roads are unpaved and the power line crossing over the roads very low.

(4) Material and Equipment Storage Plan

The prefabricated construction materials that are disembarked at the Manila International Port will be inspected by customs and kept in a bonded warehouse for a short period of time. They will then be transported by land to the Project's two stockyards (one in Isabela for Region II and the other in Batangas for Region IV). Equipment and materials procured in each region and in Manila will also be stored in these stockyards for later delivery to each Project site depending upon the progress of construction work.

4-4-4 Implementation Schedule

1) Project Construction boundaries

The Project construction boundaries to be undertaken by the Japanese and Philippines sides are shown in Table 4-9.

Table 4-9 Project Construction Boundaries to be Undertken by the Japanese and Philippine Sides

WORK ITEM	Japanese Side	Philippine Side
1. Securing of Project sites.		○
2. Site clearing prior to commencing Project construction work.		○
3. Incidental work, such as gardening and fencing.		○
4. Construction of access roads to Project sites prior to the commencement of Project construction work.		○
5. Installation of facilities for distribution of electricity, water supply, and drainage, and other incidental facilities to Project sites when needed.		○
6. Obtaining building, occupancy, and all necessary permits for the Project with respect to the laws and regulations of the Philippine Government.		○
7. Securing the necessary budget and personnel for the proper and effective maintenance of Project schoolbuildings and equipment.		○
8. Procurement of Project use equipment and materials in Japan and their shipment to Project sites in the Philippines.	○	
9. Procurement of Project use equipment, materials, and labour in the Philippines and their transportation to Project sites.	○	
10. Construction of Project facilities.	○	
11. Exempting Taxes and all other levies and duties and ensuring prompt unloading and customs clearances at the port of disembarkation in the Philippines for Project use materials and equipment.		○
12. Exempting Japanese nationals involved in the Project from customs duties, internal taxes, and other fiscal levies which may be imposed in the Philippines with respect to the supply of the equipment and services under the verified contracts.		○
13. According Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contracts for their entry into the Philippines and stay therein for the execution of the Project.		○
14. Bearing of commissions to the Japanese foreign exchange bank for the banking services based on the Banking Arrangement in accordance with the standard grant procedure.		○
15. Bearing all expanses other than those to be borne by the Grant, necessary for the construction of the schoolbuildings as well as for the transportation and installation of the equipment.		○
16. Effective operation and management of the facilities and equipment to be provided under the Grant Aid.		○

2) Implementation Schedule

The preparation of the Project Implementation schedule will be made based on the premise that the measures to be taken by the Philippine and Japanese governments will be carried out smoothly in accordance with procedures established by the Grant Aid Program of the Government of Japan.

Project implementation will start when the Exchange of Notes for the Project is signed by both governments. The preparation of the detailed design, the tendering for the construction work, the fabrication of building frames, the shipping of equipment and materials, and the facility construction work will then follow in five steps.

* Detailed Design:

After the confirmation of the consultant contract agreement by the Government of Japan, the consultant will prepare the tender documents based on the Basic Design Study Report. The specifications and detailed items for Project facilities should be decided upon as a result of discussions to be held with the actual users of Project facilities.

As for the boundaries between the measures to be undertaken by the Philippine and Japanese governments for the Project under the Grant Aid Program of the Government of Japan, they should be clarified during the early stage of the detailed design period on the Exchange of Notes.

Both governments will take the necessary steps to promote the forming of the organization structure of the Project's implementation agency, and to secure the necessary funds for the Project to meet the requirements of the Grant Aid Program. It will take approximately two months to prepare the detailed design.

* Tendering for Project Construction Work

The tender period is that time which is required for tender announcement, prequalification evaluation of tenders, tender opening, and tender evaluation prior to reaching contract agreement.

The methods for tendering and for reaching contract agreement should be carefully decided upon after discussions are held with representatives from both governments. There will be an approximately 40 day tender period.

* Fabrication and Transportation of Frame Structures

The preparation of the detailed drawings will commence immediately after the contract agreement is reached. After the completion and approval of the detailed drawings, the frame structures for Project schoolbuildings will be fabricated at manufacturing plants. After the construction contract agreement is negotiated, it will take at least five months to effect the first shipment of frames. The ship transporting the frames will depart from the Port of Yokohama and will sail to Manila. The shipping time from the manufacturing plant to the Project sites (this includes the time for effecting land transportation and obtaining custom clearance) will take from 20 to 30 days.

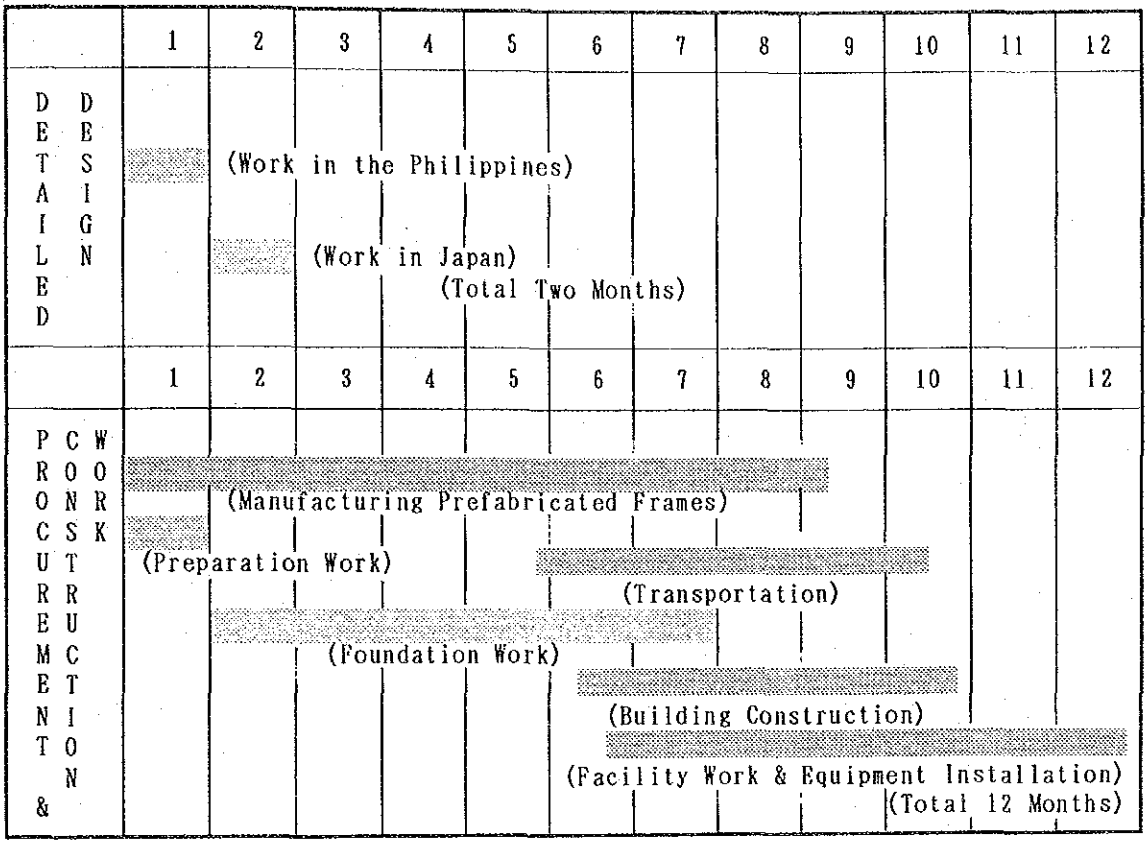
* Construction

The first material shipment will be made approximately five Months after the contract agreement is signed. It would be desirable to complete the construction of most of the schoolbuilding foundations during the five month period that will be necessary to prefabricate and ship the frame structures. During this period, it would also be desirable to proceed with the construction of toilets using the Philippine method. Weather conditions permitting, the foundations can be completed in approximately four weeks.

In Regions II and IV, it would be most desirable to complete the earth and foundation construction work during the dry season (March through October). From ten to fourteen days will be needed to erect the prefabricated frame structures. Once construction personnel become familiar with the job, one week per site should be sufficient to complete the erection work.

The Project implementation schedule is shown in Table 4-10.

Table 4-10 Project Implementation Schedule



4-4-5 Construction Costs to be Borne by the Philippine Side

Construction costs to be borne by the Philippine side is estimated as being 3,886,000 pesos. The breakdown of the costs is as follows:

Land Clearance:	887,000 pesos
Removal of Existing Buildings:	150,000
Water Supply Work:	685,000
Power Supply Work:	2,164,000
TOTAL	3,886,000 pesos

CHAPTER 5. PROJECT EVALUATION AND CONCLUSION

CHAPTER 5 PROJECT EVALUATION AND CONCLUSION

The Government of the Philippines has been promoting the education and manpower development and has been making every effort to improve the education conditions. However, the number of primary and secondary schools are still Insufficient. Some 2.56 million school-age children cannot receive an education.

In addition to the above situations, typhoons, especially the ones in 1987, inflicted heavy damage to many primary and secondary schools. And now, the lack of classrooms has become more and more of a serious problem. The construction of primary and secondary schoolbuildings is an urgent matter for the Government of the Philippines.

(1) Project Effects

Under the above-mentioned situations, including the construction of the schoolbuildings for 72 primary and secondary schools in Region V (Bicol Region) as the Phase I project, 69 primary and secondary schools in Region VIII (Eastern Visayas Region) as the Phase II project, and 72 primary and secondary schools in Region II (Cagayan Valley) and Region IV (Southern Tagalog) as the Phase III Project, the five-year schoolbuildings construction plan for 360 schools located throughout the country will have the following effects:

(a) Increase Opportunities for Children to Attend School

516 classrooms have either been or are being built under the Phase I and II projects. 158 classrooms are for primary schools; 358 are for secondary schools. Assuming that one classroom can accommodate 40 students, these classrooms can accommodate 20,640 students.
274 classrooms are to be built under the Phase III Project. 75 of the classrooms are for primary schools; 199 are for secondary schools. These classrooms will accommodate 11,358 students.
As a result, 31,998 students will be able to use the classrooms built under the Phase I, II and III projects. Thus, the Projects

will represent a meaningful contribution towards increasing the opportunities for children to attend school.

(b) Contribution to Area Residents

The Project's school facilities will not only be used for classroom purposes (including classes that will be conducted in two or three shifts) but also as places of refuge for area residents during periods of natural calamities and as meeting places. This additional use of the Project's school facilities will be a beneficial contribution to the area residents.

(c) Activation of Rural Economies

The construction of numerous schoolbuildings in the rural areas of the Philippines will provide employment opportunities for area residents. The local procurement of construction materials and equipment other than prefabricated building frames will make a significant contribution towards stimulating the rural economies of the Philippines.

Since the Project was proposed as being a part of the Philippine Government's six-year schoolbuildings construction plan, the necessary staff and the maintenance and management for the Project facilities have already been included in the plan. Furthermore, since the main objective of the Project is to rebuild school facilities destroyed by typhoons, new Project facilities will be adequately maintained and managed by the present school staff and budget.

The selections of Project facilities (other than buildings) were made based on the principles of minimum maintenance and management costs, i.e., maintenance free facilities and equipment in order to allow maintenance and management work at the lowest cost.

(2) Conclusion

The chronic shortage of school facilities in the Philippines is a serious problem for the country. Furthermore, the problem has been compounded by the damage inflicted on school facilities by typhoons.

In the Medium-term Philippine Development Plan, the National Economic and Development Authority described that the improvement of school education is an important mainstay of the country's manpower resources development, and that it is of utmost importance to determine how best to improve the quality of education while, at the same time, promoting industrial development and economic growth.

It is believed that the implementation of the Project will be indispensable for the achievement of the country's education development plan; it will greatly contribute to the promotion of the national development plan.

Project school facility construction will also alleviate the chronic school facility shortage thereby enabling many children to receive a proper education which, in turn, will contribute to the improvement of the country's education conditions. Therefore, it is considered to be appropriate to implement the Project under the Japanese Government's Grant Aid Program.

As the management and maintenance of the Project's school facilities has been planned within the scope of the Philippine Government's six-year schoolbuildings construction plan, it is judged that the amount of budgetary funds and the number of staff personnel will be sufficient to handle the job.

(3) Recommendations

1. The Project shall be implemented with the cooperation of both Japan and the Philippines. Therefore, it will be of great importance that the construction work to be borne by the Philippine side is definitely carried out for successful Project implementation. In particular, site preparation and the construction of access roads

to the Project sites must be completed prior to the commencement of schoolbuildings construction. Furthermore, DECS and DPWH must maintain close cooperation and establish a solid Project implementation system.

2. Even though the school facilities' major structures are designed after making a thorough examination of the principals of minimum maintenance and management costs, i.e., maintenance free facilities, it would be desirable to give more consideration to the maintenance system. For example, the students could clean the school facilities as part of the school's education program.

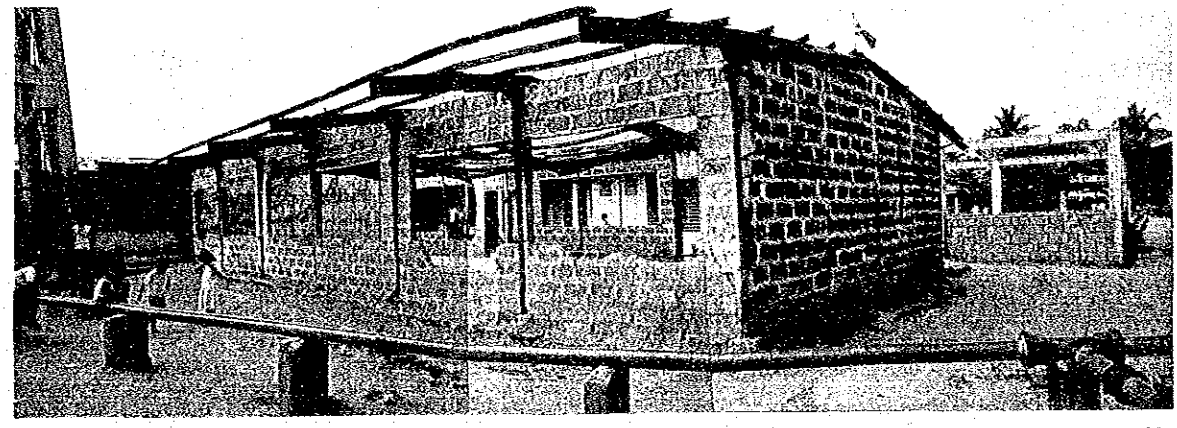
APPENDICES

APPENDICES

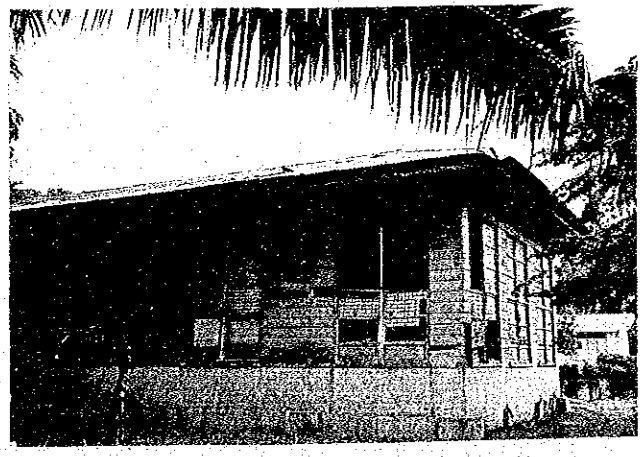
APPENDIX 1. Area Photographs

E-2. PUNTA ELEMENTARY SCHOOL

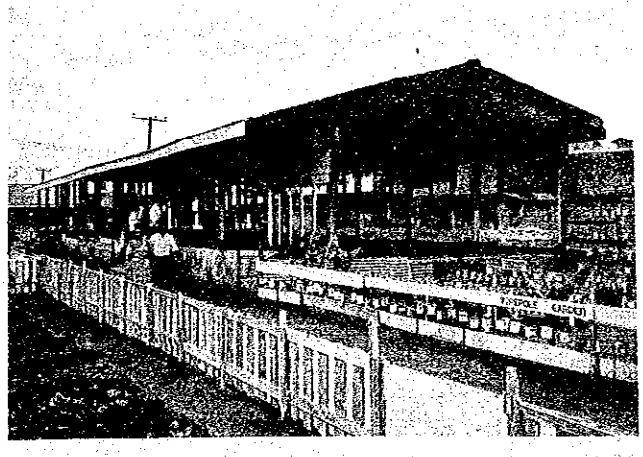
E-2. PUNTA ELEMENTARY SCHOOL



E-8. LANGGAM ELEMENTARY SCHOOL



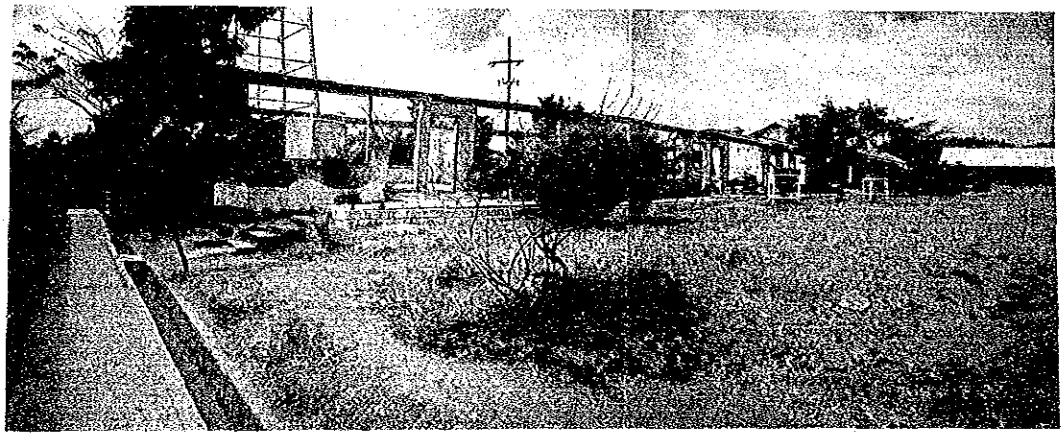
E-11. CALACA ELEMENTARY SCHOOL



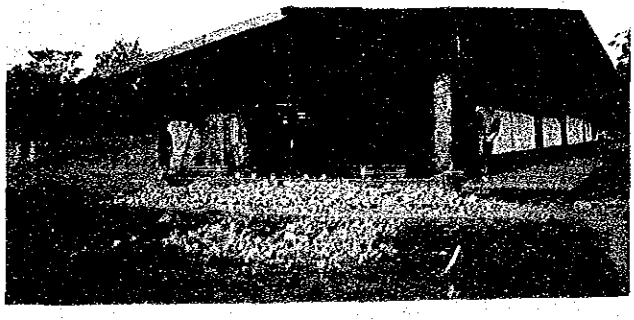
E-14. TALABA ELEMENTRAY SCHOOL

E-15. BULIHAN SITES SERVICES ELEMENTARY SCHOOL

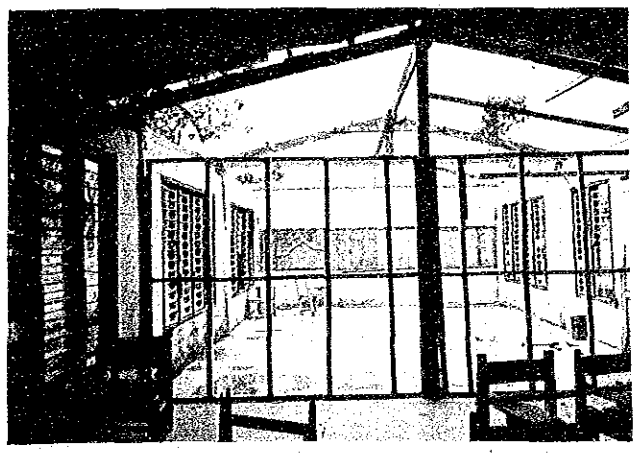
E-18. TAYABAS EAST ELEMENTARY SCHOOL



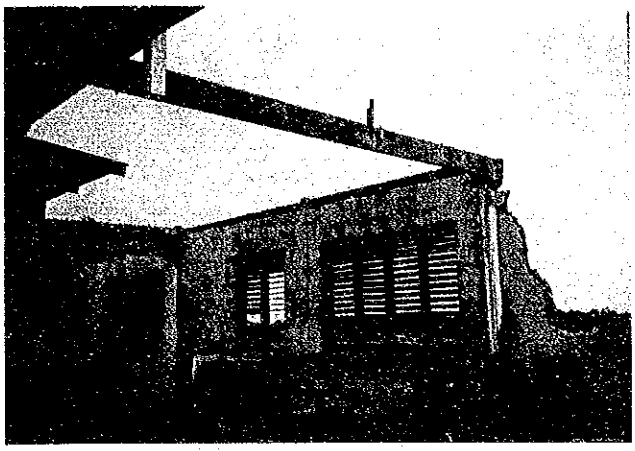
E-22. BAGONG NAYON II ELEMENTARY SCHOOL



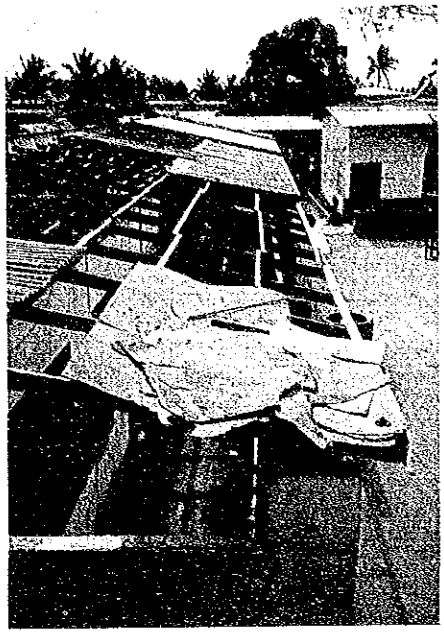
S-27. MABINI HIGH SCHOOL



S-32. RAMON NATIONAL HIGH SCHOOL

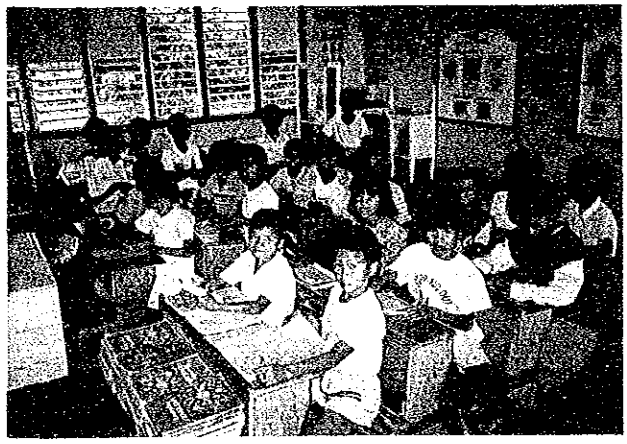


S-54. LIGTONG BARANGAY HIGH SCHOOL



S-54. LIGTONG BARANGAY HIGH SCHOOL

Signing of the Minutes of Discussions



Typical Classroom

APPENDIX 2. Member List of the Basic Design Study Team

NAME	ASSIGNMENT	AFFILIATION
Mr. Yutaka Yokoi	Team Leader	Deputy Director Grant Aid division Economic Cooperation Bureau Ministry of Foreign Affairs
Mr. Takenobu Mohri	Architectural Planner	Mohri, Architect and Associates, In
Dr. Masaaki Suko	Architectural Designer (1)	Mohri, Architect and Associates, In
Mr. Shiro Sasaki	Architectural Designer (2)	Mohri, Architect and Associates, In
Mr. Tomihide Chishina	Construction Planner/ Cost Estimator	Mohri, Architect and Associates, In

APPENDIX 3. Itinerary of the Study Team

A Group: Takenobu Mohri
C Group: Tomihide Chishina
B Group: Masaaki Suko
D Group: Shiro Sasaki

No.	Date	Activities			
1	1991 Feb 20, Wed	Study Team departed Tokyo (10:00 by JAL 741) and arrived Manila 13:45			
2	Feb 21, Thu	Made courtesy visit to the Japanese Embassy and JICA Office in Manila and held a meeting concerned with the Project. Made courtesy visit to DECS			
3	Feb 22, Fri	Held a meeting at DECS's Regional Office in Region IV (A, B, and C Groups). Group D departed Manila at 11:00, arrived Tuguegarao at 11:55, and held a meeting at DECS's Regional Office in Region II.			
		A Group: Stayed in Manila	B Group: Stayed in Tagaytay	C Group: Stayed in Lipa	D Group Stayed in Tuguegarao
4	Feb 23, Sat	Team Leader departed Tokyo (10:00 by JAL 741) and arrived Manila 13:45)	Stayed in Batangas	Stayed in Lucena	Stayed Santiago
5	Feb 24, Sun	Meeting among Study Team. Clarified collected data. Examined survey results.	Returned to Manila	Stayed in Santa Cruz	Stayed in Bayombong
6	Feb 25, Mon	Made courtesy Visit to Japanese Embassy, JICA Office and DECS		Returned to Manila	Stayed in Cabanatuan
7	Feb 26, Tue	Team Leader and A Group inspected the Phase III Project's school sites			Returned to Manila

No.	Date	Activities			
8	Feb 27, Wed	Reported field survey results to Japanese Embassy and JICA Office. Held a meeting with DECS. Held a meeting among the Study Team on the field study results, and clarified, examined, and analyzed obtained survey data.			
9	Feb 28, Thu	Held a meeting with DECS. The Minutes of Discussions on the Project was signed by the Team Leader and the Secretary of DECS.			
10	Mar 1, Fri	Reported the results of field surveys to the Japanese Embassy and JICA Office. Team Leader departed Manila (14:50 by JAL 742) and arrived Tokyo 19:50			
11	Mar 2, Sat	Held a meeting among the Study Team and confirmed the study schedule.			
12	Mar 3, Sun	Held a meeting among the Study Team. Clarified and analyzed obtained data.			
13	Mar 4, Mon	Held a meeting with DECS			D Group: Departed Manila at 12:00 by PR 224 for Tuguegarc
14	Mar 5, Tue	Held a meeting with DECS	B & C Groups made field surveys		Confirmed school sites. Departed Tuguegarao 12:55 by PR 237 for Manila
			Moved by car	Moved by car	
15	Mar 6, Wed	Held a meeting with DECS			
16	Mar 7, Thu	Held a meeting with DECS			
17	Mar 8, Fri	Held a meeting among the Study Team. Examined and discussed the field survey results. Made building and equipment related cost estimate surveys and collected data.			
18	Mar 9, Sat	Held a meeting among the Study Team. Made supplemental surveys. Examined collected data.			

No.	Date	Activities
19	Mar 10, Sun	Held a meeting among the Study Team. Clarified and analyzed collected data.
20	Mar 11, Mon	Held a meeting with DECS
21	Mar 12, Tue	Held a meeting among the Study Team. Clarified and evaluated the field survey results. Held the final meeting with DECS
22	Mar 13, Wed	Reported the field survey results to the Japanese Embassy and JICA Office
23	Mar 14, Thu	The Study Team Departed Manila at 14:50 by JAL 742 and arrived Tokyo 19:50.

APPENDIX 4. List of Personnel Interviewed

During the Basic Design Study's field survey period, the Study Team interviewed the following personnel:

(1) Concerned Personnel of the Philippine Side:

* DECS

Dr. Isidro Carino	Secretary, DECS
Dr. Erlinda C. Pefianco	Under Secretary, DECS
Mr. Ramon C. Bacani	Assistant Secretary, DECS
Mr. Estela M. Ferriols	Engineer, DECS-Consultant
Mr. Alberto Bantugan	Educational Program Specialist II. DECS
Ms. Luis Purisima	Senior Education Program Specialist, DECS
Mr. Felipe Beronilla	Architect, DECS

* DECS-EDPITAF

Dr. Achilles Del Callar	Executive Director, EDPITAF-DECS
Mrs. Amelida C. Cruz	Deputy Executive Director, EDPITAF-DECS
Ms. Yolanda Ramo	Head, Grant Administration Office, EDPITAF-DECS
Mrs. Lilia J. Tuason	Project Manager, EDPITAF-DECS
Ms. Teresita Domingo	Senior Program Specialist, EDPITAF-DECS
Ms. Millagros Talinio	Project Development Office, EDPITAF-DECS

* DECS's Region II

Regional Office

Mr. Francisco Taccad	Chief Secondary, Education Development, Regional Office II
Mr. Leonides Israel	Educational Supervisor II DECS Regional Office II
Mr. Damian P. Maguira	Assistant Chief, Technical Vocational Education DECS Regional Office II
Mr. Pedro Balino	Craft Demonstrator, DECS Regional Office II

* DECS's Region IV

Region Office

Ms. Desideria R. Rex	Regional Director, DECS Regional Office IV
Mr. Rodelio Manglapuz	Physical Facilities Coordinator, DECS Regional Office IV

(2) Concerned Personnel of the Japanese Side

* Japanese Embassy in Manila

Mr. Nobuyasu Abe	Minister
Mr. Koh Dekiba	First Secretary

* JICA Manila Office

Mr. Moriya Miyamoto	Resident Representative
Mr. Kikuo Takeuchi	Deputy Resident Representative
Mrs. Harumi Ookawa	Assistant Resident Representative

MINUTES OF DISCUSSIONS

ON

THE PROJECT FOR CONSTRUCTING PRIMARY AND SECONDARY SCHOOLBUILDINGS (PHASE III)

IN

THE REPUBLIC OF THE PHILIPPINES

MINUTES OF DISCUSSIONS
ON
THE PROJECT FOR CONSTRUCTING PRIMARY AND SECONDARY SCHOOLBUILDINGS (PHASE III)
IN
THE REPUBLIC OF THE PHILIPPINES

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 schoolbuildings, Phase III, and the Japan International Cooperation Agency (JICA) sent to the Philippines the study team headed by Mr. Yutaka Yokoi, Deputy Director, Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs of the Government of Japan, from February 20 to March 14, 1991. The team had a series of discussions on the project with the officials concerned of the Government of the Republic of the Philippines and conducted a field survey in Regions II and IV.

As a result of the study, both parties agreed to recommend to their respective Governments that the major points of understanding reached between them, attached herewith, could be examined towards the realization of the Project.

Manila, 28 February 1991

横井 裕

MR. YUTAKA YOKOI
Leader
Basic Design Study Team
Deputy Director
Grant Aid Division
Ministry of Foreign Affairs
The Government of Japan

DR. ISIDRO D. CARIÑO
Secretary
Department of Education,
Culture and Sports

The Government of the Republic
of the Philippines

ATTACHMENT

1. Project Title

The project for constructing primary and secondary school-buildings (Phase III)

2. Objective of the Project

The objective of the Project is to construct typhoon resistant pre-fabricated schoolbuildings in Regions II and IV with basic equipment that go with them.

3. Government Organizations Related to the Project

Responsible and Coordinating Agency for the Project:
Department of Education, Culture and Sports (DECS)
Educational Development Projects Implementing Task Force (EDPITAF)

4. Schools to be Covered by the Project

The list of schools where the schoolbuildings and equipment will be provided is shown in Annex 1.

5. Project Location

The project locations in Regions II and IV are as shown in the map in Annex 2.

6. Major Items Included in the Project

The major items included in the project are listed in Annex 3.

7. Tentative Floor Plans

Tentative floor plans for the primary and secondary schoolbuildings are shown in Annex 4.

8. Grant Aid Program

1) The Government of the Philippines understands that Japan's Grant Aid Program includes the requirement of employing a Japanese consulting firm to implement the project to provide the buildings and the equipment.

2) The Study Team will convey to the Government of Japan the desire of the Government of the Philippines that the Government of Japan takes necessary measures in

implementing the Project and providing necessary buildings and equipment under the Japan's Grant Aid Program.

3) The Government of the Philippines confirms that it will implement the necessary measures as listed in Annex 5 on condition that a Grant Aid by the Government of Japan will be extended to the Project.

ANNEX 1

PROJECTED RECIPIENTS OF TYPHOON RESISTANT BUILDINGS
FROM THE JAPANESE GRANT IN AID PROGRAM

NAME OF SCHOOL	LOCATION
REGION II	
Elementary School	
E-1. Masisit Elementary School	Sanchez Mira, Cagayan
E-2. Punta Elementary School	Aparri East, Cagayan
E-3. Gayong Elementary School	Cordon, Isabela
E-4. Oddiawan Elementary School	Solano, Nueva Vizcaya
E-5. Gov. Alfonso Castaneda Elementary School	Dupax del Sur, Nueva Vizcaya
Secondary School	
S-33. Baggao High School	Baggao, Cagayan
S-34. Calaoagan Dackel High School	Gattaran, Cagayan
S-35. Camasi High School	Penablanca, Cagayan
S-36. Ballesteros High School	Ballesteros, Cagayan
S-37. Mabini High School	Gamu, Isabela
S-38. Calliang High School	San Miguel, Isabela
S-39. Don Mariano Marcos High School	Echague, Isabela
S-30. Sta. Maria High School	Sta. Maria, Isabela
S-31. Benito Soliven High School	B. Soliven, Isabela
S-32. Ramon National High School	Ramon, Isabela
S-33. Highway Region High School	Echague, Isabela
S-34. Bintawan National High School	Villaverde, Nueva Vizcaya
S-35. Oddiawan National High School	Solano, Nueva Vizcaya
S-36. Dupax National High School	Dupax del Norte, Nueva Vizcaya
S-37. Diadi National High School	Diadi, Nueva Vizcaya
S-35. Paniki High School	Bagabag, Nueva Vizcaya
S-40. Murong Barangay High School	Bagabag, Nueva Vizcaya
S-39. Saguday National High School	Saguday, Quirino
TOTAL REGION II: Elementary Schools = 5 Secondary Schools = 18	
REGION IV	
Elementary School	
E-22. Bagong Nayon II Elementary School	Cogeo, Rizal
E- 8. Langgam Elementary School	San Pedro, Laguna
E-16. Pakil Elementary School	Pakil, Laguna
E- 9. Balakilong Elementary School	Laurel, Batangas
E-10. Nasugbu West Central Elementary School	Nasugbu, Batangas
E-11. Calaca Elementary School	Calaca, Batangas
E- . Batangas South Central Elementary School	Batangas City
E-12. Lipa City South Elementary School	Lipa City, Batangas

NAME OF SCHOOLS	LOCATION
E-14. Talaba Elementary School	Bacoor, Cavite
E-15. Bulihan Civic Services Elementary School	Silang I, Cavite
E-17. Mulanay Central Elementary School	Mulanay, Quezon
E-18. Tayabas East Elementary School	Tayabas, Quezon
E-19. Yawe Elementary School	P. Burgos, Quezon
E-20. Gumaca West Central Elementary School	Gumaca, Quezon
E-21. Dalahican Elementary School	Lucena City
E- 6. AV Mijares Elementary School	Baler, Quezon
E- 7. San Luis Elementary School	San Luis, Aurora
Secondary School	
S-61. Malaya Barangay High School	Pililla, Rizal
S-70. F.P. Felix Municipal High School	Cainta, Rizal
S-69. Antipolo Municipal High School	Antipolo, Rizal
S-68. Concepcion Barangay High School*	Plaridel, Quezon
S-72. Quisao Barangay High School	Pillila, Rizal
S-60. Lingga Barangay High School	Calamba, Laguna
S-58. Masapang Barangay High School	Victoria, Laguna
S-71. Dayap Barangay High School	Dayap, Laguna
S-43. Laiya Barangay High School	San Juan Batangas
S-44. F. Paterno Memorial High School	Calaca, Batangas
S-45. Lumbangan Barangay High School	Nasugbu, Batangas
S-46. Wenceslao Trinidad Memorial High School	Laurel, Batangas
S-47. Maabud Barangay High School	San Nicolas, Batangas
S-48. San Pedro Barangay High School	Sto. Tomas, Batangas
S-49. Sta. Clara Barangay High School	Sto. Tomas, Batangas
S-50. Anilao Barangay High School	Anilao, Batangas
S-51. Sapak Barangay High School	Lipa City, Batangas
S-52. Caluangan Barangay High School	Magallanes, Cavite
S-53. Kaong Barangay High School	Silang, Cavite
S-54. Ligtong Barangay High School	Rosario, Cavite
S-56. Cavite Provincial Science High School	Maragondon, Cavite
S-57. Lumil Barangay High School	Silang, Cavite
S-55. Dasmarinas Relocation School-Annex*	Dasmarinas, Cavite
S-62. Infanta Prov'l High School	Infanta, Quezon
S-63. Camohaguin Barangay High School	Gumaca, Quezon
S-64. Talipan Barangay High School	Pagbilao, Quezon
S-65. Paiisa Barangay High School	Tiaong, Quezon
S-66. Amontay Barangay High School	Pitogo, Quezon
S-67. Tongohin Barangay High School	Infanta, Quezon
S-59. Bagopaye Barangay High School	Mulanay, Quezon
S-41. Ditumabo Barangay High School	San Luis, Aurora
S-42. Palocpoc Barangay High School	Mendez, Cavite

TOTAL REGION IV: Elementary Schools = 17
Secondary Schools = 32

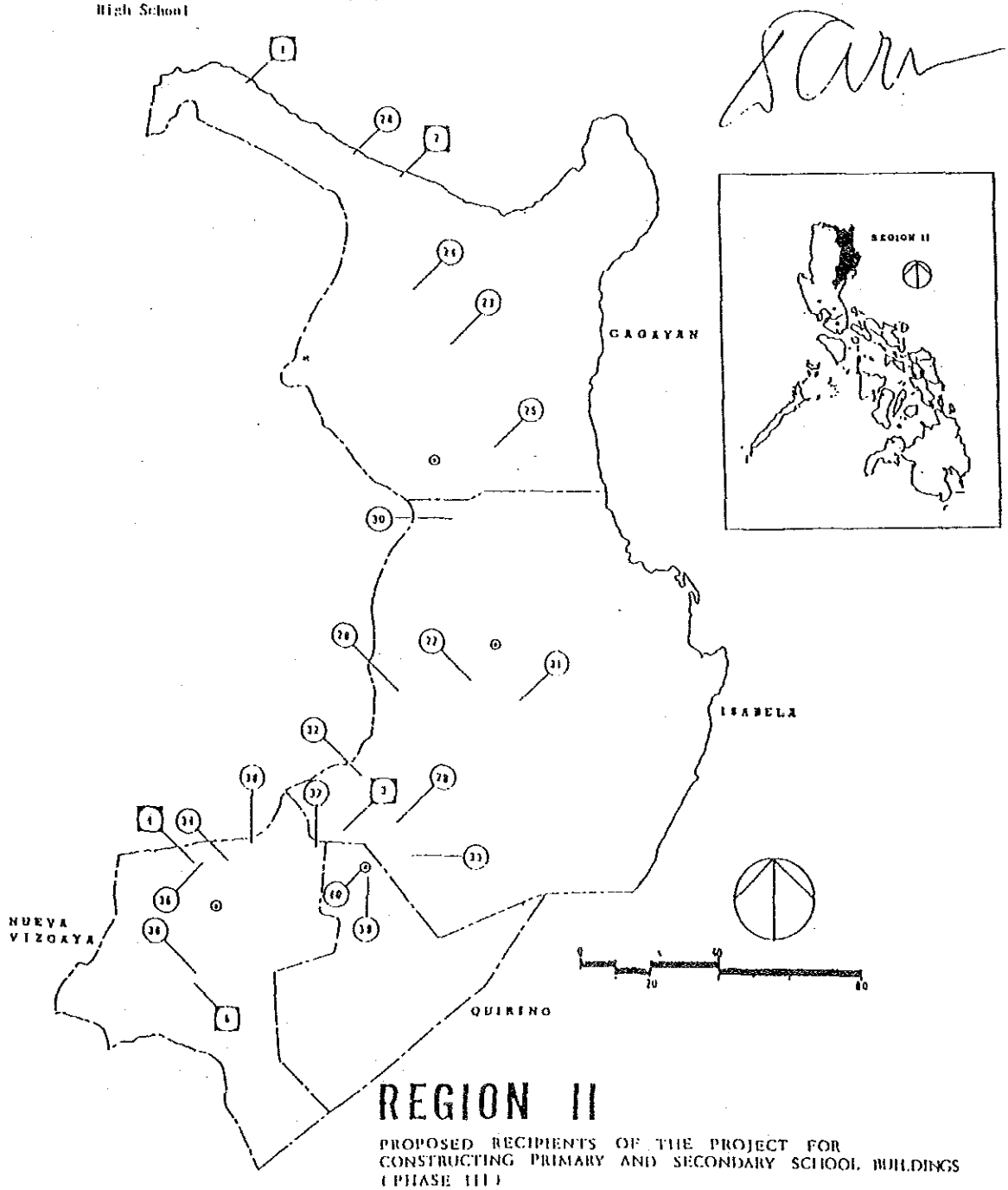
REMARKS: *These schools (Concepcion BHS and Dasmarinas Relocation School Annex) are included subject to further verification by the Basic Design Study Team which should be completed on or before 11 March 1991.

ANNEX 2

LIST OF RECIPIENT SCHOOLS FOR REGION II

NUMBER	NAME OF SCHOOL	LOCATION
E-1	Masisit Elementary School	Masisit, Sanchez Mira, Cagayan
E-2	Punta Elementary School	Punta, Aparri
E-3	Gayong Elementary School	Cordon, Isabela
E-4	Oddiavan Elementary School	Solano, Nueva Vizcaya
E-5	Gov. Alfonso Castaneda Elementary School	Dupax, del Sur Nueva Vizcaya
S-23	Baggao High School	Baggao, Cagayan
S-24	Calaoagan Dackel High School	Gattaran, Cagayan
S-25	Camasi High School	Penablanca, Cagayan
S-26	Ballesteros High School	Ballesteros, Cagayan
S-27	Mahini High School	Mahini, Gamu, Isabela
S-28	Gattang High School	San Manuel, Isabela
S-29	Don Mariano Marcos High School	Echague, Isabela

NUMBER	NAME OF SCHOOL	LOCATION
S-30	Sta. Maria High School	Sta. Maria, Isabela
S-31	Benito Soliven High School	Benito Soliven Isabela
S-32	Ramon National High School	Ramon Isabela
S-33	Highway Region High School	Garit Norte, Echague, Isabela
S-34	Bintawan High School	Villaverde, Nueva Vizcay
S-35	Oddiavan National High School	Solano, Nueva Vizcaya
S-36	Lamo National High School	Dupax, Nueva Vizcaya
S-37	Diadi National High School	Diadi, Nueva Vizcaya
S-38	Pantki High School	Bagabag, Nueva Vizcaya
S-39	Saguday National High School	Saguday, Quirino
S-40	Nurong High School	Nurong, Bagabag, Nueva Vizcaya

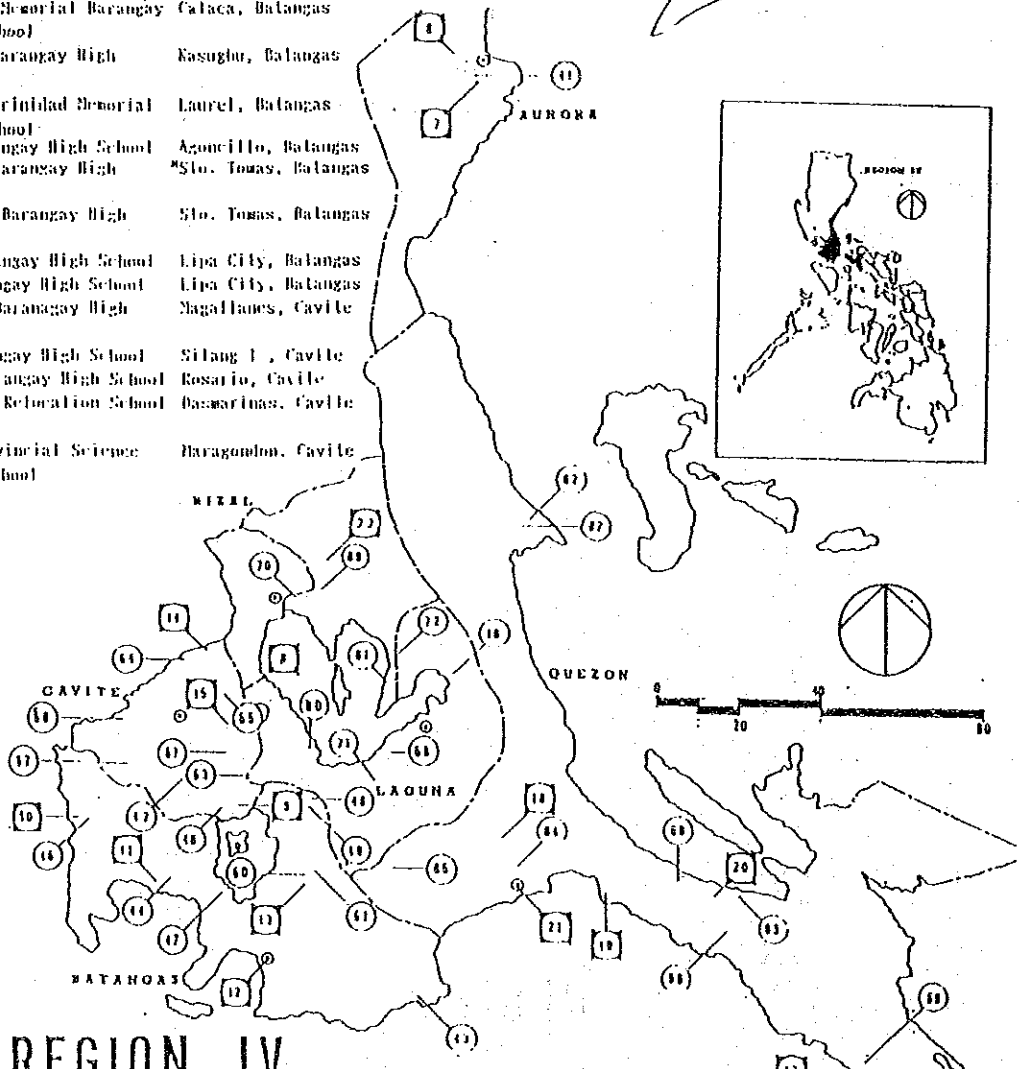


PROPOSED RECIPIENTS OF THE PROJECT FOR CONSTRUCTING PRIMARY AND SECONDARY SCHOOL BUILDINGS (PHASE III)

ANNEX J

LIST OF RECIPIENT SCHOOLS FOR REGION IV

NUMBER	NAME OF SCHOOL	LOCATION
E-6	A.V. Mijares Elementary School	Baler, Aurora
E-7	San Luis Elementary School	San Luis, Aurora
E-8	Langgam Elementary School	San Pedro, Laguna
E-9	Balakilong Elementary School	Laurel, Batangas
E-10	Kasuglan West Elementary School	Kasuglan, Batangas
E-11	Calaca Elementary School	Calaca, Batangas
E-12	Batangas South Central Elementary School	Batangas City, Batangas
E-13	Lipa City South Elementary School	Lipa City, Batangas
E-14	Talaba Elementary School	Bacoor, Cavite
E-15	Bulihan Sites Services Elementary School	Silang I, Cavite
E-16	Pakil Elementary School	Pakil, Quezon
E-17	Sulanay Central Elementary School	Sulanay, Quezon
E-18	Tayabas East Elementary School	Tayabas, Quezon
E-19	Yaoc Elementary School	Padre Burgos, Quezon
E-20	Gumaca West Central Elementary School	Gumaca, Quezon
E-21	Dalahican Elementary School	Lucena City, Quezon
E-22	Bagong Nayon II Elementary School	Cogeo, Rizal
S-41	Dilumabo Barangay High School	San Luis Aurora
S-42	Palocpoc Barangay High School	Palocpoc, Indez, Cavite
S-43	Laiya Barangay High School	San Juan, Batangas
S-44	P. Paterno Memorial Barangay High School	Calaca, Batangas
S-45	Lumbangan Barangay High School	Kasuglan, Batangas
S-46	Venceslao Trinidad Memorial High School	Laurel, Batangas
S-47	Maalad Barangay High School	Agoncillo, Batangas
S-48	San Pedro Barangay High School	Sto. Tomas, Batangas
S-49	Sta. Clara Barangay High School	Sto. Tomas, Batangas
S-50	Anilao Barangay High School	Lipa City, Batangas
S-51	Sapac Barangay High School	Lipa City, Batangas
S-52	Calumpang Barangay High School	Magallanes, Cavite
S-53	Kaong Barangay High School	Silang I , Cavite
S-54	Ligtong Barangay High School	Rosario, Cavite
S-55	Basmarinas Relocation School - Annex	Basmarinas, Cavite
S-56	Cavite Provincial Science High School	Maragondon, Cavite
S-57	Lumil Barangay High School	Silang I, Cavite
S-58	Masapang Barangay High School	Victoria, Laguna
S-59	Bagupaye Barangay High School	Sulanay, Quezon
S-60	Lingga Barangay High School	Calauan, Laguna
S-61	Balaya Barangay High School	Pililla, Quezon
S-62	Infanta Provincial High School	Infanta, Quezon
S-63	Casolaguin Barangay High School	Gumaca, Quezon
S-64	*Talipan Barangay High School*	*Pagbilao, Quezon*
S-65	Palisa Barangay High School	Tiaong, Quezon
S-66	Anoulay Barangay High School	Pitogo, Quezon
S-67	Longohin Barangay High School	Infanta, Quezon
S-68	Conception Barangay High	Mauriel, Quezon
S-69	Antipolo Municipal High School	Antipolo, Rizal
S-70	C.C. Celis Municipal High School	Cainta, Rizal
S-71	Dayap Barangay High School	Calauan, Laguna
S-72	Quisao Barangay High School	Pililla, Quezon



REGION IV

PROPOSED RECIPIENTS OF THE PROJECT FOR CONSTRUCTING PRIMARY AND SECONDARY SCHOOL BUILDINGS (PHASE III)

ANNEX 3

THE MAJOR ITEMS INCLUDED IN THE PROJECT

1. Buildings

(1) Primary School

Classrooms
Toilet

(2) Secondary School

Classrooms
Science Room
Toilet

2. Equipment

(1) Primary School

Pupil's desks, chairs and side shelves
Teacher's desks, chairs and filing cabinets in the classrooms
Tables stools and workbenches for science room
Blackboards and bulletin boards

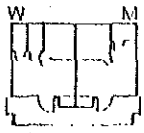
(2) Secondary School

Pupil's desks, chairs and side shelves
Teacher's desks, chairs and filing cabinets in the classrooms
Tables, stools and workbenches for science room
Blackboards and Bulletin Boards

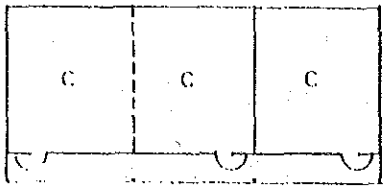
ANNEX 4

FLOOR PLANS

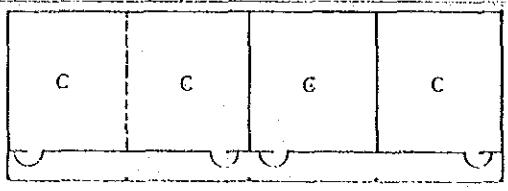
ELEMENTARY SCHOOL (2 TYPES)



TOILET (COMMON TYPE: 25.5M²)

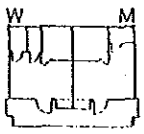


B TYPE (16.2M²)

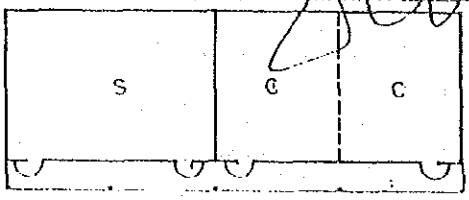


C TYPES (216.0M²)

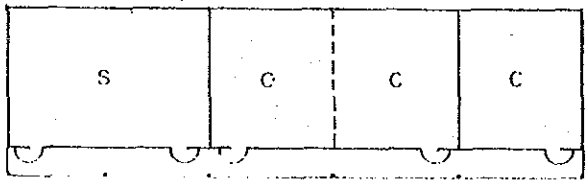
SECONDARY SCHOOL (4 TYPES)



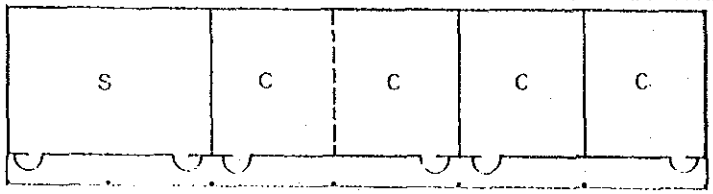
TOILET (COMMON TYPE: 25.5M²)



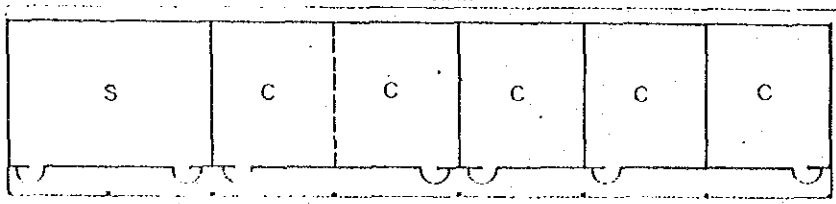
SA TYPE (198.0M²)



SB TYPE (252.0M²)



SC TYPE (306.0M²)



SD TYPE (306.0M²)

LEGEND C: CLASS ROOM S: SCIENCE LABORATORY

ADDENDUM TO THE SIGNED MINUTES
OF DISCUSSIONS DATED 28 FEBRUARY 1991
THE PROJECT FOR CONSTRUCTING PRIMARY AND SECONDARY
SCHOOLBUILDINGS (PHASE III)

1. This Addendum is being executed to modify the REMARK found in Annex 1 of the Minutes of Discussions dated 28 February 1991.

2. The Basic Design Team together with their DECS and EDPITAF counterparts, conducted a follow-up survey to Concepcion Barangay High School (S-68) and Dasmariñas Relocation School-Annex (S-55) on March 05, 1991 and found these schools meeting the qualification standards set for the above-named project.

3. Based on this consideration, the inclusion of Concepcion Barangay High School (S-68) and Dasmariñas Relocation School-Annex (S-55) in the Phase III Project is hereby confirmed.

Signed this 8th day of March 1991 in Pasig, Metro Manila, Philippines.

THE GOVERNMENT OF JAPAN
THE BASIC DESIGN STUDY TEAM

By:

MORIYA MIYAMOTO
Resident Representative
Japan International
Cooperation Agency

For MR. YUTAKA YOKOI
Team Leader
Deputy Director
Grant Aid Division
Ministry of Foreign Affairs

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

By:

ISIDRO D. CARINO
Secretary

ANNEX 5

UNDERTAKINGS BY THE GOVERNMENT OF THE PHILIPPINES

1. To secure the sites for the Project.

2. To clear, level and reclaim the site prior to the commencement of the construction.

3. To undertake incidental outdoor works such as gardening, fencing, etc.

4. To construct access roads to the site prior to the commencement of construction (only in case they are not available).

5. To provide facilities for distribution of electricity, water supply, drainage and other incidental facilities to the site when needed.

6. To obtain building, occupancy and all necessary permits for the Project with respect to the laws and regulations in the Philippines.

7. To ensure necessary budget and personnel for the proper and effective maintenance of the schoolbuildings and equipment provided under the Grant Aid.

8. To provide exemptions for taxes and all other levies and duties and to ensure prompt unloading and customs clearances at the port of disembarkation in the Philippines for the materials and the equipment provided under the Grant Aid.

9. To exempt Japanese nationals involved in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in the Philippines with respect to supply of the equipment and services under the verified contracts.

10. To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contracts such facilities as may be necessary for their entry to the Philippines and stay therein for the execution of the Project.

11. To bear commissions to the Japanese foreign exchange bank for the banking services based on the Banking Arrangement, in accordance with the standard grant procedure.

12. To bear all expenses other than those to be borne by the Grant, necessary for the construction of the schoolbuildings as well as for the transportation and installation of the equipment.

13. To undertake the pre-site survey in the target beneficiary region/s well in advance of the arrival of the Basic Design Mission in the event that GOP requests further assistance for its school building program and to make sure that the proposed sites of the GOP will meet project requirements (i.e., from the view point of necessity and feasibility of the construction).