List of Tables and Figures

Abbreviations

ADB	Asian Development Ban
ARMM	Autonomous Region of Muslim Mindanao
BHN	Basic Human Needs
CAR	Cordillera Administrative Region
CO	Capital Outlay
DBM	Department of Budget and Management
DECS	Department of Education, Culture & Sports
DepEd	Department of Education
DPWH	Department of Public Works and Highways
EDPITAF	Educational Development Projects Implementing Task Force
EFIP	Project for the Improvement of Educational Facilities
ICC	Investment Coordination Committee
IRA	Internal Revenue Allotment
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
LGU	Local Government Unit
MOOE	Maintenance & Other Operating Expenses
NEDA	National Economic & Development Authority
OPS	Office of Planning Service
PDED	Project Development and Evaluation Division
PDM	Project Design Matrix
PFD	Physical Facilities Division
PHIVOLCS	Philippine Institute of Volcanology and Seismology
PMU	Project Management Unit
PTA	Parents Teachers Association
PTCA	Parents Teachers Community Association
RDC	Regional Development Council
SEDIP	Secondary Education Development and Improvement Project
SIDA	Swedish International Development Agency
SRA	Social Reform Agenda
TEEP	Third Elementary Education Project
TESDA	Technical Education and Skills Development Authority
TRSBP	Typhoon Resistant School Building Project

UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
WB	World Bank

Summary

The Government of the Philippines has been making efforts to improve basic education, and under new Arroyo Administration in January of 2001 the 'Medium-Term Philippine Development Plan 2001-2004' was written. One of the prime four-pronged policies of the plan is the 'Comprehensive Human Development and Protecting the Vulnerable,' trying to relieve the problem of poverty in the Philippines. To address the education sector, the 'Master Plan for Basic Education 1996-2005' was established, aiming at expanding educational opportunity and improving the quality and effectiveness of education. However, due to the rapid school-age population increase and the expanded access to schools, enrollment between 1996 and 2001 increased from about 11,850,000 to 12,830,000 at the elementary level, and from about 4,990,000 to 5,810,000 at the secondary level. Therefore there is a serious problem of classroom shortages in the Philippines, which becomes a large obstacle for the above-mentioned development plans.

To help the Philippines with this situation, the Government of Japan, through its grant aid projects program, implemented the Typhoon Resistance School Building Project 1988-1993 (rebuilding classrooms, etc. in 360 schools) and the Project for Improvement of Educational Facilities phases I to V (EFIP) 1993-1999 (constructing classrooms, etc. in 421 schools country wide). In addition to this, with the co-financing of the World Bank in a loan-based project, the Government of Japan has been implementing the Third Elementary Education Project (TEEP) 1997-2004, which is a plan to improve the quality and quantity of elementary education including construction of school buildings for the 22 poorest Provinces. Also being implemented, with co-financing from the Asian Development Bank, is the Secondary Education Development and Improvement Project (SEDIP) 1999-2006, which is targeting secondary education in the same provinces as the TEEP.

Despite these efforts, the problem of classroom shortages is still serious. The total number of classroom shortages in the public elementary schools is about 66,000, and about 6,800 in the public secondary schools. Many schools have had to overcrowd their classrooms, use badly deteriorated facilities or temporary classrooms, rent outside facilities, conduct multi-shift classes or use special rooms such as library, science labs, art, music, and pre-school rooms for ordinary classrooms. In addition, because Region III (located near Metro Manila) had an average annual population increase rate of 3.2%

between 1995 and 2000, which was higher than the national average of 2.6%, the classroom shortage problem in this region is one of the most serious in the country. The total number of classroom shortages for both the elementary and secondary schools in Region III is now more than 5,000. Classroom congestion is especially serious at the secondary level where some schools have more than 100 students per classroom, even though the standard is 40 per classroom.

In order to improve the situation, the Government of the Philippines requests, as a Japan's Grant Aid Project, phase VI of the Project for Improvement of Educational Facilities, which constructs elementary and secondary school in the Central Luzon Region (Region III) and the West Mindanao Region (Region IX, Region XII and ARMM= Autonomous Region in Muslim Mindanao). (From a security point-of-view, the West Mindanao Region was excluded from the Project and only Region III remained as the target area of the Project)

At the request for phase VI from the Philippines, a Basic Design Study was conducted from February 7 to March 16, 2002. The Basic Design Study Team (hereinafter referred to as Team) had discussions with representatives of the Philippine Department of Education (hereafter referred to as DepEd) and other associated people to discuss Project feasibility and detailed plan, while the Team conducted site survey at each school and obtained other necessary information. After the Team came back to Japan, based on the results of the study, the relevance of the Project, maintenance and management systems, and effect of the Project were analyzed. Then, the Japanese side set the appropriate facility components and the scale of the Project, selected materials and equipment, and calculated a rough cost estimate for implementation of the Project. In order to explain these outlines of basic design of the Project to the Philippine side, the Draft Report Explanation Team was dispatched from June 26 to July 3, 2002.

From the original 142 schools surveyed, based on the following nine criteria which were agreed on with DepEd, a total number of 85 schools (elementary schools 31, secondary schools 54) were selected as the Project schools.

① Schools which have sufficient size of land to construct facilities;
② Schools with no security problems;
③ Schools which have proper access roads in order to carry construction materials and equipment into the respective sites;
④ Schools where sufficient teaching staffs and budget can be allocated in order to operate and

maintain facilities and equipment properly

⑤ Schools where no other programs of new classroom construction are on-going or scheduled by other donors, NGOs and so forth;

⑥ Schools which have no threat of natural calamity such as Mt. Pinatubo lahar or flooding;

⑦ Schools which urgently need additional classrooms due to the school congestion by serious shortage s of classrooms;

⑧ School which have the legal rights to use the land for the construction of facilities;

⑨ Schools which provide certificates or permissions necessary for the Project implementation within a specified time frame;

The components of the Project are to construct classrooms at 85 recipient schools, toilets at 84 schools (1 school's toilets were deleted because of insufficient land space), science laboratories at the 22 schools which do not have science laboratories, and to procure science equipment at the 26 schools which don't have any equipment. The size of the school facilities to be built depends on the urgent needs at each site school. The basic plan stipulates from 2 to 12 classrooms (depending on need). Further, it depends on the condition of the land at each site to determine whether 1, 2, or 3 story buildings will be constructed and what types of buildings will be set up (there are 12 types of buildings). 3 types of toilets are planned depending on the number of classrooms to be built.

Regarding architectural design plans, reflecting the situation that requires a more effective and efficient implementation of grant aid projects and further cost reduction, significant cost reduction for the Project was planned. Free from the continuous use of the same architectural designs as in previous phases of the Project, structural designs and design specifications were reexamined, and the Project follows the new DepEd design standards while still keeping the minimum necessary quality.

The following table shows the content of the Project buildings.

The Content of Project Buildings

	Elementary School	Secondary School	Total
Number of the Project Schools	31	54	85
Single Story Building	(28)	(26)	(54)
Two Story Building	(3)	(24)	(27)
Three Story Building	(0)	(4)	(4)
Number of Classrooms	90	335	425
Number of Toilets	30	54	84
Number of Science Lab	—	22	22
Number of Science Equipment Sets	—	26	26
Total Floor Area (m²)	6,941.70	29,952.68	36,894.38
Remarks	①Structure type of the buildings is reinforced concrete. ②For two and three story buildings, two stairs (for emergency and for regular use) are installed. ③A slope for the handicapped is constructed at the entrance of each building. ④3 types of the toilet (Large, Medium, and Small) are planned according to the number of classrooms to be constructed. A toilet booth for the handicapped is planned in each male and female toilet.		

The selection of basic educational furniture was based on the standards of DepEd. As for science equipment, by referring to the DepEd standards list and the secondary schools' science education curriculum, the basic equipment was selected.

Furniture and science equipment are summarized in the following table.

List of Major Furniture and Science Equipment

School Type	Type of Furniture and Equipment	Room Type ／Subject	Major Items
Elementary School	Furniture	Classrooms	student's desk, student's chair, teacher's desk, teacher's chair, closet, blackboard, bulletin board etc.
Secondary School	Furniture	Classrooms	student's chair with small table, teacher's desk, teacher's chair, closet, blackboard, bulletin board etc.
		Science Laboratory	demonstration table, experiment work bench, stool, storage shelf, blackboard, bulletin board etc.
	Science Equipment	General Science	platform balance, hand lens, magnetic compass, thermometer, terrestrial globe etc.
		Biology	compound microscope, mitosis model, chart of chromosomes, dissecting set etc.
		Chemistry	triple beam balance, graduate cylinder, Erlenmeyer flask, pipette, Ph meter etc.
		Physics	convex and concave mirror, spring balance, prism set, multi-tester, logic gate, tuning forks set etc.

Construction materials and furniture are to be procured locally for the sake of easy maintenance and operation of facilities after completion of the Project. Science equipment should also be procured locally as much as possible. However, it is difficult to procure some items in the

Philippines in terms of quality, availability, and cost, thus those items will be procured in Japan.

According to the survey results, in phases I to V of the Project, there were some schools that had problems in maintenance and operation of facilities and furniture. For the proper maintenance and operation of Project facilities, it is necessary that people in charge at each Project school fully acquire the skills and knowledge for the appropriate maintenance activities. Through the software component, activities will be conducted during the Project implementation, such as making a guideline and informing the associated people of the contents of the guideline, and introducing case studies of school maintenance and operation situations.

The maintenance, operations, and other management activities are performed by each Project school in cooperation with PTCA (Parents-Teachers-Community Association), under the jurisdiction of the DepEd Division office. The annual expense for maintenance and operating management of all 85 Project schools is estimated at 3,400,000 pesos (approx 8,740,000 yen), which is 0.872% of Region III's 2001 maintenance and operating management (MOOE) budget (total 390 million pesos). Thus, the amount is considered feasible.
As for the teacher allocation, upon the completion of teacher allocation in school year 2002 and of the Project, there are only 3 schools that would have more classrooms than the number of teachers. In order to fully utilize the classrooms at those 3 schools, 5 teachers are necessary. Since it is very unlikely that the teacher allocation would suddenly decrease after 2003, inclusion of 5 teachers in the teacher allocation plan between 2003 and the completion of the Project is judged to be feasible.

The following benefits are expected after Project Implementation:

① Improvement of the Learning Environment
In the project schools, 19,215 students will be able to study in the new, "better environment" classrooms; and, teachers as well as students will be able to have classes with a more appropriate educational style.

② Improvement of Sanitary Conditions
The shortage of toilets will be reduced. By introducing the software component, the Project will promote more efficient maintenance activities, and so the sanitary conditions for the students

will be improved.

③ Holding of Proper Science Classes

In those schools where science laboratories and equipment will be covered, appropriate science classes that follow a proper curriculum will become possible. As a result, student-focused learning shall be promoted which will contribute to the improvement of general student achievement in the education of the sciences.

④ Acquiring Skills for Facility Operation, Maintenance and Management

Through the introduction of the software component, the Project will improve the skills and techniques necessary for the proper execution of management, operation and maintenance of the facilities at each Project school, which will result in prolonging the life of both new and existing facilities. In the long term, it is expected that the cost borne by the Philippine side for rehabilitation and maintenance will be reduced significantly.

⑤ Benefits to the Local Community

The Project schools are expected to contribute to the local communities in that the school facilities can also be used for other community activities, whether social-educational activities such as meetings, adult education and literacy classes, or as evacuation shelters from natural disasters, etc.

In conclusion, this Project can expect many benefits to be realized while also meeting the conditions necessary to receive Japan Grant Aid funds; thus, the implementation of this Project has a high value and is deemed worthy and meaningful. If the items mentioned below are improved, this project will be implemented more smoothly, and thus more effectively contribute to improving the general educational environment.

① Appropriate Operation and Maintenance

After the implementation of the software component, which aims to establish the appropriate know-how for proper maintenance and operation of facilities and instruct that know-how to the proper people, it is necessary that the school principals and other persons in charge be regularly monitored and supervised with the support of the DepEd, so as to establish an appropriate and sustainable maintenance and operation system with the same level of quality among all the

Project schools.

Presently, as the mandatory collection of PTCA fees is prohibited, DepEd must guarantee the appropriation of sufficient and necessary budgetary funds to sustain the school facility maintenance and operation program activities.

② Effective Use of Science Laboratories and Equipment

For more effective use of the equipment and to incorporate the conducting of science experiments into the class, it is necessary that special training and/or allocation of special-subject science teachers, as well as special guidance for the making of lesson plans be provided. Another problem is that some teachers are reluctant to use the science equipment for fear of damaging it. Thus, DepEd should frequently monitor the Project schools and encourage teachers to use the lab equipment. Further, DepEd should encourage each school to use its science equipment through the securing of budget funds for necessary consumable items such as chemicals and fuel, etc.

③ Multiple Use of the Project Facilities

Several considerations, like electrical installation, movable partitions, securing of building durability, etc, have been taken into account and included in the basic design so that the Project facilities can also be used by the community for other purposes, such as a shelter in an emergency or as a place for meetings or other non-formal education classes, etc.

It is required that DepEd and the Project schools promote frequent use of the Project facilities to the community, informing them of the openness and flexible characteristics of the facilities for their use, and that they should actively and effectively utilize the facilities.

CONTENTS

Chapter 1 Background of the Project

Chapter 1 Background of the Project

(1) Background of the Project

The Republic of the Philippines has been trying to secure educational opportunities for all the children by focusing on basic education. The Medium Term Philippine Development Plan 2001–2004, made under new the Arroyo Administration, stipulates the "Comprehensive Human Development and Protecting the Vulnerable" as one of the four targets for poverty alleviation. As well, in educational sector, the "Master Plan for Basic Education 1996–2005" promotes expansion of educational opportunities and the improvement of educational quality and efficiency as critical concerns.

As access to a basic education expands, enrollment increases every year. On the other hand, classroom shortages are becoming a more serious problem, which hinders progress of above mentioned plans. Especially at the secondary level, affected by the introduction of the free public secondary educational system, the shortages are extremely serious due to increases in the enrollment at the primary level and increases in the school-age population. Schools temporally respond to the problem by adopting double-shift classrooms or by increasing the number of students per classroom

To help the Philippines with this situation, the Government of Japan, through its grant aid projects program, implemented the Typhoon Resistance School Building Project 1988-1993 (rebuilding classrooms, etc. in 360 schools) and the Project for Improvement of Educational Facilities phases I to V (EFIP) 1993-1999 (constructing classrooms, etc. in 421 schools country wide). In addition to this, with the co-financing of the World Bank in a loan-based project, the Government of Japan has been implementing the Third Elementary Education Project (TEEP) 1997-2004, which is a plan to improve the quality and quantity of elementary education including construction of school buildings for the 22 poorest Provinces. Also being implemented, with co-financing from the Asian Development Bank, is the Secondary Education Development and Improvement Project (SEDIP) 1999-2006, which is targeting secondary education in the same provinces as the TEEP.

However, as of 2002, there has been a nation-wide shortage of about 56,000 classrooms at the elementary level and 6,800 classrooms at the secondary level. Especially in Region III (located near Metro Manila), because of the high growth rates in the annual population, the classroom shortage problem in this region is one of the most serious in the country. The total number of

classroom shortages for both the elementary and secondary schools in Region III is now more than 5,000. In addition, while the general financial situation of Region III is comparatively good, the financial base of some of the municipalities is too weak to construct any new school buildings. Even in urban area municipalities with strong financial bases, classroom shortages are so overwhelming that it is virtually impossible to construct an adequate number of classrooms that would alleviate all the shortages.

In order to improve the situation, the Government of the Philippines requests, as a Japan's Grant Aid Project, phase VI of the Project for Improvement of Educational Facilities.

(2) Contents of the Request

Project Area: the Central Luzon Region (Region III) and the West Mindanao Region (Region IX, Region XII and ARMM= Autonomous Region in Muslim Mindanao). (From a security point-of-view, the West Mindanao Region was excluded from the Project and only Region III remained as the target area of the Project)

Contents of the Request: 450 classrooms, 50 science laboratories, toilets, water facilities, educational furniture and science equipment at 150 elementary and secondary schools

Chapter 2 Contents of the Project

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

2-1-1 Overall Goal and Project Purpose

Recently, the enrollment of children in schools in the Philippines has been increasing every year due to the population growth and their improved access to a basic education. The country has seen a dramatic increase in students, particularly in secondary schools, since a free secondary school education system was introduced, and classroom shortages have become a serious problem.

Region III is close to Metro Manila and has one of the highest rates of population increases in the Philippines, and the shortage of classrooms in Region III totaled 5,319 in 2002. In general, the schools are responsible for taking remedial actions on the problem of classroom shortages. Many schools have had to overcrowd their classrooms, use badly deteriorated facilities or temporary classrooms, rent outside facilities, conduct multi-shift classes or use special rooms such as library, science labs, art, music, and pre-school rooms for ordinary classrooms. Furthermore, there are many secondary schools that possess neither science laboratories nor even basic equipment for experiments, and at those schools science education is not being taught according to the curriculum that the Department of Education (hereinafter referred to as DepEd) has laid out.

With this situation in mind, the goal of 'Medium Term Philippine Development Plan 2001-2004' is to improve the quality of the basic education and so is the Project's overall goal. In this Project, the Project's purpose is to improve the educational environment in Region III.

2-1-2 Outline of the Project

In order to achieve the Project purpose and goal, the Project will construct classrooms and toilets at 31 elementary and 54 secondary schools (total of 85 schools) that are mainly located in the municipalities with financial limitations; the Project will also construct science laboratories and procure science equipment to those secondary schools which have no laboratories or equipment. Through the implementation of these activities, the Project intends to improve the learning environment at the Project schools.

To fully accomplish the Project purpose and goal, proper operation and maintenance of the schools is vital for long-term use of both the existing and the new additional facilities to be constructed by the Project. In order to do this, the Project will introduce software component, which aims to orient the schools for the appropriate maintenance of school facilities, in parallel with construction.

2-2 Basic Design of the Requested Japanese Assistance

2-2-1 Design Policy

(1) Basic Principles Regarding School and Component Selection for the Project

As the total shortage of classroom amounts to more than 2,500 for 142 schools surveyed in the Basic Design Study, it is not possible to fully solve the problem of the extreme classroom shortage, because the number of classrooms to be built by the Project is limited. Thus, a criteria has to be set up for deciding the number of additional classrooms to be built and in which schools to build. During the site survey period the Study Team confirmed some basic differences between the classroom shortages in elementary schools and those in secondary schools.

During discussions with DepEd, most of the elementary schools located in the class 1 & 2 municipalities[1] were eliminated from the Project because DepEd's priority is elementary school development in the not so well-to-do areas of the country[2]. This is one of the reasons that the most of the Project schools are located in the class 3 to 6 municipalities, which has financial limitations. As a result, many Project elementary schools are widely distributed in rural areas than urban areas, with a high number of students per classroom but with a small number of classroom shortages. These schools cannot realistically expect any new building construction by the local governments because school building construction had basically not been a devolved function of the local governments, and school building projects by the local people's donation are very seldom in these areas. Thus, they try to ease this situation by putting more students in the already crowded classrooms, using temporary classrooms, having open-air classes and using very old classrooms which are deemed unsafe and should be demolished.

On the other hand, the number of classroom shortages and the average number of students per classroom is very high in the secondary schools and the many Project schools are generally large in size and are usually located in the class 1 & 2 zones of the urban areas. Because of the introduction of the free secondary education system, there is a large concentration of

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[1] In the Philippines, municipalities are ranked from 1 to 6 according to the size of the revenue. The 1st municipalities have the largest revenue.

[2] The elementary schools located in the class 1st and 2nd municipalities with shortages of 10 or more classrooms were included in the site survey.

students as the students come from several municipalities.

In summary, because of these differences between the elementary and secondary schools, different approaches shall be taken in selecting the recipient schools for the Project, as well as calculating the number of classrooms to be built by the Project (refer to Chapter 2-2-2-1).

In addition, except for those schools which have specially limited building space, all Project schools will be constructed with toilets. Moreover, giving higher priority to the alleviation of the ordinary classroom shortages, science laboratories and science equipment will be constructed and procured only to those secondary schools without them.

(2) Policies Regarding the Natural Environment

The Project Area has a tropical climate with high temperatures and humidity throughout the year. The design preparation of the Project facilities shall allow for natural ventilation and insulation for a comfortable learning environment. As the school facilities will also be used as evacuation shelters for area residents during natural disasters like the frequent typhoons, the school facilities shall be designed so that they will be sufficiently durable for natural disasters. For example, when the Mayon Volcano erupted in February 1994 and February 2000, and when super typhoons such as Rosing in 1995 and Ilian in 1998 brought significant damage to most of the country, the school buildings constructed under previous Japanese Grant Aid projects were used as evacuation shelters by the area residents. In particular, roofs of school buildings are vulnerable to typhoon damage, so the Project buildings shall be designed to minimize the damage by carefully considering the weather resistance capability of roofing materials.

As an aftereffect of the eruption of Mt. Pinatubo in June 1991, there are also hazard zones in the danger of the lahar and floods in Pampanga, Tarlac, Bataan, and Zambales, specified by PHIVOLCS (Philippine Institute of Volcanology and Seismology). The schools located in the hazard zone shall be excluded from the Project unless PHIVOLCS certifies that the said schools will be safe if land elevation will be properly done.

(3) Design Policies Regarding Social Conditions

Project facilities shall be designed respecting the lifestyles and customs of the Philippine people. Besides serving as a place for school activities and public evacuation shelters during natural disasters, the Project facilities will also be used as a center for other various community activities. This includes, but is not limited to, community and non-formal classes,

night classes and two-shift classes which require lighting fixtures and movable partitions for the temporary separation of classrooms, etc. The facilities shall be designed to accommodate these uses, too. Further, the Project designs shall include installation of facilities for the handicapped, for example sloped accesses at the entrances and special access toilets in accordance with BATAS PAMBANSA BILANG 344, Accessibility Law.

(4) Policies Regarding Local Building Construction Standards and Codes

Building permits at the local government office must be applied for before construction so that the building designs shall be evaluated as to whether they meet the 'National Building Codes' of the Philippines. Aside from the building codes, there are 2 publications issued by The Department of Education, entitled, the "DepEd Handbook on Educational Facilities" and the "DepEd Service Manual 2000." The architectural designs of the Project should use these regulations as guidelines.

(5) Policies Regarding Local Contractors, Materials and Equipment

As there are no problems with utilizing local contractors and consultants, they shall be hired under the guidance of the Japanese engineers. Moreover, as there are no problems with the quality and available quantity of Philippine made building materials and equipment, they shall be used as much as possible. However, some construction materials whose strengths are critical in construction accuracy at the site, such as concrete, shall be tested for strength and quality.

(6) Policies Regarding Operation and Maintenance of Project Facilities

Considering the present financial difficulties being experienced by the Government of the Philippines, school facilities shall be designed so that the costs for operation and maintenance of the completed school facilities will be minimal and relatively easy. Further, the use of domestic materials for basic repairs to damaged or deteriorated facilities shall be considered in the designs.

In addition to this, as there are schools with problems of maintaining facilities constructed under the previous Projects, the software component is introduced in this Project, in order to contribute to the improvement of operation and maintenance of the facilities at each school. With an objective to deepen the understanding of appropriate maintenance activities, a guideline on maintenance will be made, and seminars will be held to introduce the content of

the guideline and case studies of maintenance situations in the previous Projects.

(7) Design Policies Regarding Quality of Materials and Cost Reduction

The Project will construct additional classrooms with basic classroom furniture and toilets at the elementary and secondary schools. In addition, for secondary schools, science laboratories will be constructed with procurement of science equipment.

Only a portion of the classroom shortages can be solved by Japan's Grant Aid Program. Efforts have been made to design the school facilities in the same manner that the buildings in phases I to V of the Project were designed, so that they can serve as a model for school building construction by the Philippine side. Because of this, all facility construction and the related quality levels of materials and components are not necessarily luxurious. Instead, they will be designed from the standpoint of the "necessary minimum" to secure building safety and ease of maintenance while providing a comfortable learning environment for daily class activities.

TEEP, the Third Elementary Education Program[3], as a loan Program, has chosen its building designs from a past Japan Grant Aid Project as a base model, and developed a new specification which improves those designs while cutting costs. These new designs developed by TEEP have been adopted as the design standards for DepEd.

In response to the present situation requiring the more effective use of Japan Grant Aid funds and the need for further cost reductions regarding project implementation, this Project aims to cut construction costs as much as possible while still keeping the minimum necessary quality. Thus, without clinging to sequence of the designs from phase I to V, new design focuses on low cost in this Project. Following the basic size of the design of restructured TEEP, other electrical, mechanical, structural and finishing specs of these restructured TEEP design standards are reviewed to seek further possibility of reducing costs for this Project.

Based on the policies mentioned in the “(6) Policies regarding Operation and Maintenance of Project Facilities”, basic teaching equipment and furniture, like blackboards, desks and chairs, etc., shall be procured on local markets. Science equipment shall also be procured on local markets for ease of maintenance. Only those items that may be difficult to procure on local markets in large quantities or have a specified quality shall be procured in Japan.

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[3] TEEP is an on-going loan program in 22 provinces of the Philippines, funded by JBIC and WB. Region III is out of the target area. In this report, TEEP from 1998-2000 is called “old TEEP” and that from 2001-present is called “restructured TEEP”.

(8) Policies Regarding Construction Schedules

The Project includes a large number of schools, and they are widely scattered all over Region III. Because of this geographical conditions and a large scale of the construction, it is considered appropriate to divide the Project construction into two stages (two fiscal years): namely, the four provinces of Pampanga, Tarlac, Zambales and Bataan in one stage, and the two provinces of Bulacan and Nueva Ecija in the other stage, after careful consideration of the transportation and the equal division of construction work between two stages.

As the Philippine side has a fair amount of retaining wall construction work and the largest amount of reclamation work to accomplish in Bulacan and Nueva Ecija, these areas should be the second stage of the Project in order to give the maximum time to finish this work. The construction headquarters shall be located in San Fernando, which is in the approximate center of Region III, and this is the most convenient area to serve as the transportation center for both stages. Considering the efficiency of the implementation and capability of local contractors, it is better that all the construction work is not carried out simultaneously, but the sites should be divided into several construction groups that will start work in different times.

2-2-2 Basic Plan

2-2-2-1 Selection of Schools and Setting up of Component Sizes for the Project

(1) Selection of Project Schools

1) Criteria for Selecting Project Schools

The agreement between the Basic Design Study Team and DepEd specified that a higher priority for selecting Project schools should be given to those schools that satisfy the following criteria:

① Schools which have sufficient size of land to construct facilities;
② Schools with no security problems;
③ Schools which have proper access roads in order to carry construction materials and equipment into the respective sites;
④ Schools where sufficient teaching staffs and budget can be allocated in order to operate and maintain facilities and equipment properly;
⑤ Schools where no other programs of new classroom construction are on-going or scheduled by other donors, NGOs and so forth;
⑥ Schools which have no threat of natural calamity such as Mt. Pinatubo lahar or flooding;
⑦ Schools which urgently need additional classrooms due to the school congestion by serious shortages of classrooms;
⑧ Schools which have the legal rights to use the land for the construction of facilities;
⑨ Schools which provide certificates or permissions necessary for the Project implementation within a specified time frame;

2) Prerequisites for Selecting Project Schools

① Estimation of enrollment in the future

Enrollment into elementary and secondary schools is decided based on the direct submission of an application to the desired school, and public schools are mandated to accept all students intending to enroll. Hence, DepEd cannot in any way adjust the number of students enrolling in each school. In theory, students attend the nearest school, but in practice, many students have a tendency to go to the more "popular schools" despite long traveling distances. In this way, school district are not be clearly defined. In addition, there are no statistics on school-aged children at the district level other than those of the DepEd Division level or higher. Thus, it is

impossible to estimate the future enrollment at the Project schools based on the data of the number of school-aged children in the school districts, as the data is only available at the provincial level.

The other possible way to calculate the number of future students will be based on student data for the past five years that was obtained by the Study Team during the field survey period. However, in any case, even if there are increases in future student enrollment, it will not make much difference in the number of classrooms that the Project builds. Because of the limited funds, the Project can ease only a part of the overwhelming congestion of students.

In this Project, the number students gathered in the site survey in February 2002 is used as the basis for calculating the number of classroom shortages. Further, among the candidate schools, no school has shown sharp decrease in enrollment. （Refer to 'Enrollment of candidate schools for the past 5 years in Appendix 7–(2)） Because of all these reasons, fluctuations in enrollment will not be taken into consideration and the calculations shall be based on current enrollment data.

② Dealing with a Multi-Shift System

DepEd considers the multiple-shift class system only as temporary measure and prefers each school to conduct single-shift class system. However, because of extreme classroom shortages, DepEd does not prohibit practicing multiple-shift classes and considers that it is one way to overcome the shortage situation as well as to ease the increase of students in one classroom. Besides, constructing temporary classrooms, renting outside facilities and converting special rooms into classrooms are other common methods to solve the shortage problem.

Although many schools conduct multiple-shift classes, most of them are not clearly divided into morning and afternoon classes. Many schools adopt irregular-shift classes where the classrooms are occupied by other classes when vacant, even for short break periods. Thus, the way of conducting multiple-shift classes varies from school to school.

Although many schools do conduct double-shift or irregular-shift classes, they are considered it as tentative measures because it is assumed that those schools have plans to eventually return back to a single-shift system in the future. For this reason, the formula for counting the shortage of classrooms shall not be applied to schools that conduct multi-shift classes.

③ Methods for Calculating Existing Classrooms

The following information is the basis for calculating what existing classrooms are:

- Classsrooms presently being used in good condition are counted as existing classrooms. Classsrooms presently being used that only need repair are also counted as existing classrooms.

- Although some schools have special rooms such as science laboratories, libraries, home economics rooms and industrial arts rooms, etc, they lack regular classrooms. They sometimes convert these special rooms to the regular classrooms to ease congestion. According to DepEd policy, these special rooms are "necessary" as stipulated in the "DECS Service Manual 2000, Chapter 2, Section 4.4." However, in reality, most of the small-sized schools do not fully comply with the "necessary" part of the stipulation. Thus, rooms originally designed as special rooms are counted as special rooms, whether these special rooms are used as special rooms or as regular classrooms.
- There are many elementary schools that have rooms for pre-school children. Installation of pre-school rooms at elementary schools is stipulated in the 'Early Childhood Care and Development (ECCD) Law, 2000.' Therefore, if a Project school has pre-school rooms, they shall not be counted as existing classrooms.

④ "Standards" for Number of Students

DepEd formerly set the standard number of students in one classroom at 40, but that was changed to 45 along with the change of classroom size from 7m×8m to 7m×9m in October, 2001 as a "reform" measure. Therefore, the decision was made to set 40 students as the standard number of students for existing classrooms and 45 students as the standard number of students for the new additional classrooms to be built by the Project. The standard number of students to be accommodated in one science laboratory should also be 45.

⑤ Deciding the "Maximum Number of Students per Classroom" and Introducing Two Formulas for Selection of the Project Schools

As described above, the former standard was 40 students per classroom; the new standard is 45. However, even though these standards exist, some schools put 70 or 80 students into a classroom by arranging the desks side by side, right next to each other with no space between them, thus no regard to safety or dangers in an emergency.

It is common sense that it is not possible to solve classroom congestion by continually adding more desks, and after "a certain number" it is just impossible to add any more. With this "certain number" in mind, a new standard will provide the criteria for deciding which schools will be selected for the Project, as well as the number of new additional classrooms the Project will build at each recipient school. This new standard is that the construction of new classrooms will be prioritized at schools that exceed the "certain number" of students per classroom.

"Certain number" is established by arranging as many desks (and chairs) as possible side by side, right next to each other while still keeping enough space between them as aisles for safety measures. This number of desks will be referred to the **"maximum number of students**

per classroom" from now on.

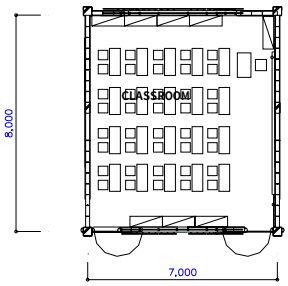
The following drawing shows the arrangement of furniture in a conventional 8m× 7m classroom (for the 40 student standard), and a new 7m × 9m classroom (for the 45 student standard - 46 for elementary schools because one desk seats 2 students). Table 2-1 shows the **"maximum number of students per classroom"** in this Project.

Table 2-1 Maximum Number of Students per Classroom

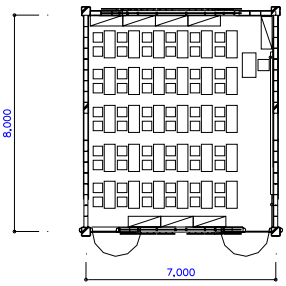
	8m × 7m size	7m × 9m size
Elementary	60 students	64 students
Secondary	56 students	63 students

Figure 2-1 Furniture Layouts for Classrooms

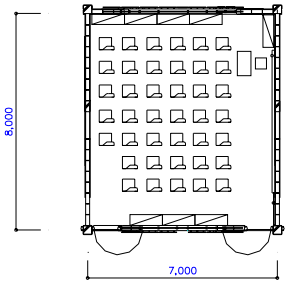
Layout for the Previous Size (8mX7m) Classroom



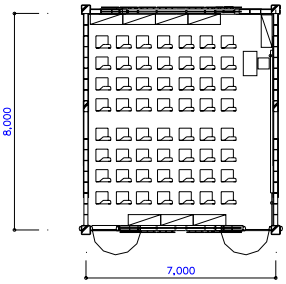
ELEMENTARY SCHOOL
STANDARD LAYOUT FOR 40 STUDENTS



ELEMENTARY SCHOOL
LAYOUT FOR 60 STUDENTS

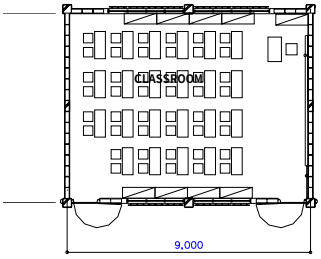


SECONDARY SCHOOL
STANDARD LAYOUT FOR 40 STUDENTS

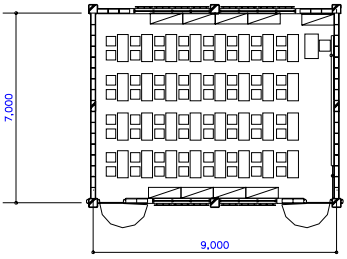


SECONDARY SCHOOL
LAYOUT FOR 56 STUDENTS

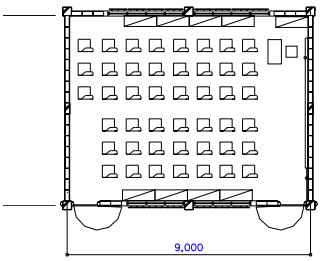
Layout for the New Size (7mX9m) Classroom



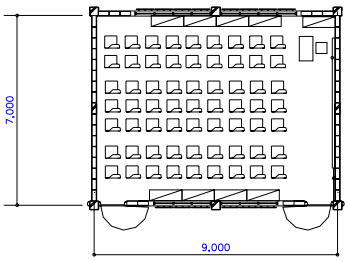
ELEMANTARY SCHOOL
STANDARD LAYOUT FOR 46 STUDENTS



ELEMENTARY SCHOOL
LAYOUT FOR 64 STUDENTS



SECONDARY SCHOOL
STANDARD LAYOUT FOR 45 STUDENTS



SECONDARY SCHOOL
LAYOUT FOR 63 STUDENTS

We have now established: 1) "the standard number of students per classroom" (40 or 45 students), and 2) "the maximum number of students per classroom" (as shown in Table 2-1). By using 1) and 2), the following two formulas, **"Shortage Formula"**, and **"Congestion Formula"** were introduced for selection of recipient schools and calculation of number of classrooms to be planned.

a) Shortage Formula

"Classroom Shortages " represents "the number of necessary classrooms" for a school when the "standard number of students per class" (new DepEd standard) figure is used in the calculation formula.

"Classroom Shortages " = { enrollment － (the number of usable Classrooms × 40)} ／ 45.

b) Congestion Formula

"Congestion Degree" represents "the minimum necessary classrooms" for a school when the "maximum number of students per class" figure is used in the calculation formula.

"Congestion Degree" = { enrollment － (the number of usable Classrooms × 60 or 56)} ／ 64 or 63.

Note: 60 and 64 are for elementary schools, 56 and 63 are for secondary schools.

For the selection of Project schools and the calculation of the number of classrooms to be constructed, as will be explained later, different calculation formula are used. The formula to be used for the calculation are as follows:

Table 2-2 Formula for the Selection of Project Schools and Calculation of Classrooms to be Planned

School	Selection of Project Schools	Calculation of Classrooms to be Planed
Elementary	Shortage Formula	Congestion Formula
Secondary	Congestion Formula	Congestion Formula

3) Selecting Project Schools

The Project schools are selected based on the following criteria

① Schools with insufficient land

The planned sites for the construction were examined carefully to confirm if they have sufficient space, and the schools with insufficient land shall be eliminated. As a result, 5 schools were eliminated in this category;

② Schools with security problems

Although most of the areas in Region III have no security problems, it was found that safety is sometimes disturbed in some mountainous areas. If the schools are located in those areas, there is a possibility that any untoward accident may occur at the construction sites or during the transportation of construction materials. During the Explanation of Draft Basic Design Report, it was reported by DepEd that 10 Project school sites located in the areas where the terrorists' activities have been seen, according to the memorandum of Philippine National Police dated May 16, 2002. One school is categorized as 'Influenced' level while the nine schools are 'Infiltrated' level.

However, it was decided that these 10 schools should not be excluded from the Project at this point, and should be monitored until the construction stage begins, because 1) Both 'Influenced' level and 'Infiltrated' level do not define the accurate degree of danger. Therefore, a detailed analysis on this matter should be taken in order to judge whether these activities certainly affect the Project implementation. 2) Security conditions keep changing day by day, and the current information of the security condition can not always be considered as that of the construction period. 3) There is a possibility that the risk may be remarkably reduced when the local communities understand the Project through the Project explanation by the Philippine side.

Thus no school was eliminated from the Project under this category;

③ Schools with access road problems for construction vehicles

Schools with access road problems for construction vehicles or schools where transportation is impossible during the rainy season shall be eliminated. However, no schools fall under this category;

④ School with problems of insufficient school operating funds or teaching staff

Schools with problems related to school operating funds or sufficient teaching staff shall be eliminated, as it is assumed that those schools will have difficulty in managing and maintaining the Project facilities over a long period of time. However, no schools fall under this

category;

⑤ Overlap with Other Donor Agencies

Schools with currently on-going projects by other foreign donors shall be eliminated, but no schools are applicable. As a general principle, even if schools have had general classrooms built by other donors in past projects, they shall not be eliminated from the Project. Classroom construction was included in past foreign donor projects, such as Secondary Education Development Project (ADB), Economic Support Fund (USAID), Engineering & Science Education Project (World Bank) and Typhoon Resistance School Building Project (Japan);

⑥ Schools located in the lahar danger zone

As an aftereffect of the eruption of Mt. Pinatubo in June 1991, there are areas in the danger of the lahar and floods in Pampanga, Tarlac, Bataan, and Zambales, specified by PHIVOLCS (Philippine Institute of Volcanology and Seismology). 3 schools, (S-54 Betis HS, S-56 Remedios HS, and S-64 Pampanga HS, school ID are old ones that were used during site survey period), are certified by PHIVOLCS as located in the hazard zone where the flooding is expected. However, it is also certified by PHIVOLCS that the 2 school sites (S-54 and S-56) out of 3 are safe from flooding, because each school property grade had already been raised properly, and the remaining school site (S-64) will be safe in case the land raising fill is provided approximately one meter. Therefore these 3 schools were kept in the Project in this category. However, as S-54 and S-56 were eliminated from the Project because of the next criteria "⑦ the number of classroom shortage", only one school (S-64) located in lahar hazard zone is included in the Project;

⑦ The number of classroom shortage

a) Elementary Schools -

Project elementary schools are to be selected by using the "Shortages" formula. Schools that satisfy at least one of the following should be selected for the Project:

a-1) Schools where "Classroom shortages" are 3 or more;

a-2) Schools where "Classroom shortages" are between 2 and 3 but the number of students in one classroom exceeds the maximum number of students(60) in one classroom.

b) Secondary Schools -

Project secondary schools are to be selected by using the "Congestion" formula, because many of the secondary schools are large sized with high number of classroom shortage. Schools that satisfy at least one of the following should be selected for the Project:

b-1) Schools where "Congestion degree" are 3 or more. However schools in the class 1 & 2 municipalities are eliminated from the project except those schools where "Congestion

degree" are 3 or more and "Classroom shortages" are 20 or more.

b-2) Schools where "Classroom shortages B" are between 2 and 3 but the number of students in one classroom exceeds the twice the standard number of students in one classroom (80).

⑧ Land Ownership

In order to avoid any future trouble related to land ownership or land use, submission of land ownership or usufruct (land use) agreement documents by each candidate school is required, and if the schools fail to submit such documents they will be eliminated from the Project. The seven types of documents, showing the legal rights to use land for facility construction that were agreed upon with DepEd, are as follows:

Table 2-3 The Legally Recognized Documents for Land Ownership or Right of Use

A	Torrence Title	Original title issued by the Bureau of Lands when a piece of land is titled for the first time.
B	Transfer Certificate of Title （TCT）	Title issued by Bureau of Land when a piece of land (titled) is transferred to a new owner.
C	Deed of Donation	Legal document issued when a landowner decides to donate his/her property to another individual or entity. This is the first step prior to the issuance of a TCT.
D	Deed of Absolute Sale	Legal document similar to The Deed of Donation except that the transfer of the property is due to purchase and not a donation.
E	Presidential Proclamation	Document when the President of the Philippines proclaims government land to be at the disposal of ancestral tribes and communities
F	Usufruct Agreement	An agreement when the land of a private indivisual, City, Municipal, or Provincial Government is allowed to be used educational purposes and has no specific period. This means for as long as the School or DepEd needs this property, the owner cannot use it for any other purposes.
G	Tax Declaration in the name of DepEd or LGU with a Certificate coming from Barangay captain and the Assessor's office of LGU	This is the least common type of document accepted by DepEd. The Certificate of Barangay captain and the Assessor states that the land has no adverse claimant.

One school failed to submit the document by the time of the Explanation on Draft of Basic Design Report, and this school was eliminated from the Project.

⑨ Other Certificates or Agreements

For schools having the special site conditions as described below, it was decided to include them in the Project if they submit certain required documents.

a) School sites where existing buildings must be demolished before the start of any new

construction need to submit a condemnation permit, issued by the local government office; and also a plan for temporary student classrooms during the construction period, which is issued by DepEd or by school principals.

b) School sites which need large-scale land development work such as constructing retaining walls need to submit a letter of agreement issued by the local government or municipality stating that the local government or municipality has agreed to do the actual land development work.

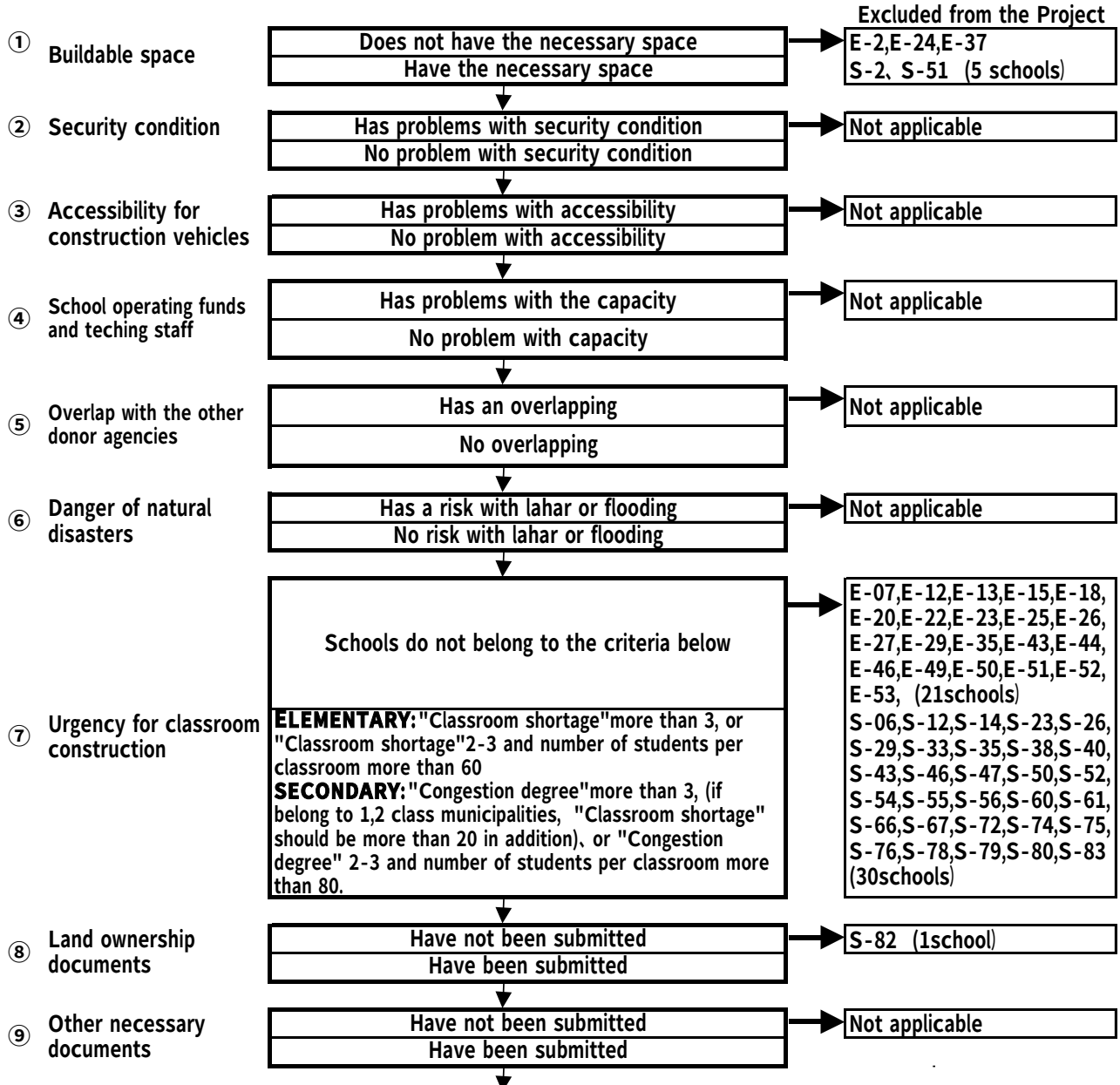
c) School sites, which do not have their own access roads for construction vehicles and must use and pass through land owned by another party need to submit a land-use agreement document signed by the landowner(s) granting permission to use the land for passage of Project construction vehicles during the construction period.

d) School sites, which agree with the construction of single-story building because of the bad soil condition although those schools are originally eligible for the construction of two- or three-story building, need to submit a letter of agreement

As all the necessary certificates or permissions were submitted by the time of the Explanation on Draft Basic Design Report, no school was eliminated in this category;

The selection process of the Project schools based on the above-mentioned criteria is shown in Figure 2-2. And the selected recipient Project schools are listed in Table 2-4.

Figure 2-2 Selection Process of the Project Schools



85 Project schools	
31 Elementary Schools	E-01,E-03,E-04,E-05,E-06,E-08,E-09,E-10,E-11,E-14,E-16,E-17,E-19,E-21,E-28,E-30, E-31,E-32,E-33,E-34,E-36,E-38,E-39,E-40,E-41,E-42,E-45,E-47,E-48,E-54,E-55
54 Secondary Schools	S-01,S-03,S-04,S-05,S-07,S-08,S-09,S-10,S-11,S-13,S-15,S-16,S-17,S-18,S-19,S-20, S-21,S-22,S-24,S-25,S-27,S-28,S-30,S-31,S-32,S-34,S-36,S-37,S-39,S-41,S-42,S-44, S-45,S-48,S-49,S-53,S-57,S-58,S-59,S-62,S-63,S-64.S-65,S-68,S-69,S-70, S-71,S-73, S-77,S-81,S-84,S-85,S-86,S-87

Note: The old school ID are used in this chart.

Table 2-4 List of Project Schools （31 Elementary Schools）

New ID number	Old ID number	School Name	Location
ELEMENTARY SCHOOLS			
Bataan 2 schools			
E-01	E-01	MAMBOG ES	Mambog, Hermosa
E-02	E-03	ORANI NORTH ES	Balut, Poblacion, Orani
Bulacan 7 schools			
E-03	E-04	BUSTOS ES	Poblacion, Bustos
E-04	E-05	BUNSURAN ES	Bunsuran, Pandi
E-05	E-06	MATIAS B. SALVADOR MEM. ES	Siling Bata, Pandi
E-06	E-08	SIBUL ES	Sibul, San Miguel
E-07	E-09	OBANDO CS	Paliwas, Obando
E-08	E-10	BAGONGBUHAY EAST CS	Fatima, San Jose del Monte City
E-09	E-11	SAN RAFAEL ES (BBH ES)	San Rafael III, San Jose del Monte City
Nueva Ecija 17 schools			
E-10	E-14	BONGABON CES	Social, Bongabon
E-11	E-16	VEGA ES	Vega, Bongabon
E-12	E-17	LIGAYA ES	Ligaya, Gabaldon
E-13	E-19	SAN FELIPE ES	San Felipe, Laur
E-14	E-21	ANDRES BONIFACIO NORTE ES	A. Bonifacio Norte, Llanera
E-15	E-28	CABUCBUCAN ES	Cabucbucan, Rizal
E-16	E-30	MACAPSING ES	Macapsing, Rizal
E-17	E-31	PACO ROMAN ES	Paco Roman, Rizal
E-18	E-32	SANTA ROSA CS	Rizal, Santa Rosa
E-19	E-33	PAG-ASA ES	Liwayway, Santa Rosa
E-20	E-34	SOLEDAD ES	Soledad, Santa Rosa
E-21	E-36	BALOC ES	Baloc, Santo Domingo
E-22	E-38	ZARAGOZA CS	San Vicente, Zaragosa
E-23	E-39	ALIAGA CS	Poblacion, Aliaga
E-24	E-40	CABANATUAN EAST CS	Maharlika Highway, Cabanatuan City
E-25	E-41	CAMP TINIO ES	Camp Tinio, Cabanatuan City
E-26	E-42	MAGSALISI ES	Magsalisi, Jaen
Pampanga 2 schools			
E-27	E-45	SANTA ANA CES	Santa Lucia, Santa Ana
E-28	E-47	EPZA Resettlement ES	Pulung Cacutud, Angeles City
Tarlac 1 school			
E-29	E-48	MORIONES ES	Moriones, San Jose
Zambales 2 schools			
E-30	E-54	BALOGANON ES	Baloganon, Masinhoc
E-31	E-55	SUBIC CS	Baraka, Subic

Table 2-4 List of Project Schools （54 Secondary Schools）

New ID number	Old ID number	School Name	Location
54 SECONDARY SCHOOLS			
Bataan 7 schools			
S-01	S-01	Don PABLO R. ROMAN Memorial HS (Pilar H	Panilao, Pilar
S-02	S-03	BONIFACIO CAMACHO HS	Poblacion, Abucay
S-03	S-04	BATAAN NHS	Roman Super Highway, Balanga City
S-04	S-05	PAGALANGGANG NHS	Pagalangang, Dinalupihan
S-05	S-07	HERMOSA HS	Culis, Hermosa
S-06	S-08	LIMAY NHS	Duale, Limay
S-07	S-09	ORANI NHS	Kawayan, Orani
Bukacan 13 schools			
S-08	S-10	ALEXIS G. SANTOS NHS	Liciada, Bustos
S-09	S-11	BUNSURAN HS	Bunsuran, Pandi
S-10	S-13	TALIPTIP HS	Taliptip, Bulacan
S-11	S-15	GUIGUINTO NATIONAL VOCATIONAL HS	Poblacion, Guiguinto
S-12	S-16	FELIZARDO C. LIPANA MEM. HS	Santa Rita, Guiguinto
S-13	S-17	MEYCAUAYAN HS	Santo Niño Subd. Perez, Meycauayan
S-14	S-18	OBANDO NHS	Paliwas, Obando
S-15	S-19	MAGUINAO-CRUZ NA DAAN HS	Maguinao, San Rafael
S-16	S-20	MARCELO H. DEL PILAR HS	Santa Isabel, Malolos
S-17	S-21	SAN MARCOS HS	Calumpang, Calumpit
S-18	S-22	SAN MIGUEL HS	San Juan, San Miguel
S-19	S-24	PARADISE FARMS HS	T. Mangga, San Jose del Monte City
S-20	S-25	SAPANG PALAY HS	Sapang Palay, San Jose del Monte City
Nueve Ecija 16 schools			
S-21	S-27	GENERAL TINIO NHS	Poblacion, General Tinio
S-22	S-28	BAGO HS	Gen. Tinio, Bongabon
S-23	S-30	PEÑARANDA NHS	Poblacion, Peñaranda
S-24	S-31	RIZAL NHS	Poblacion, Rizal
S-25	S-32	CABIAO HS	Poblacion, Cabiao
S-26	S-34	NUEVA ECIJA HS	Burgos Avenue, Cabanatuan City
S-27	S-36	JUAN R. LIWAG MEM. HS	Bayanihan, Poblacion, Gapan City
S-28	S-37	GUIMBA NHS	Saint John District, Guimba
S-29	S-39	PALAYAN CITY HS	Atate, Palayan City
S-30	S-41	AGBANNAWAG HS	Agbannawag, Rizal
S-31	S-42	SAN FRANCISCO HS	San Francisco, San Antonio
S-32	S-44	CONSTANCIO PADILLA NHS	Cadhit St., Calaocan, San Jose
S-33	S-45	SANTO DOMINGO NATIONAL TRADE SCHO	Baloc, Santo Domingo
S-34	S-48	ZARAGOZA NHS	San Rafael, Zaragosa
S-35	S-49	PUTLOD NHS	Putlod-San Jose, Jaen
S-36	S-87	CARRANGLAN HS (Annex A - Digdig)	Joson (Digdig), Carranglan
Pampanga 10 schools			
S-37	S-53	CAMBA HS	Camba, Arayat
S-38	S-57	MAUAQUE RESETTLEMENT HS	Sapang Biabas, Mabalacat
S-39	S-58	CAMATCHILES RESETTLEMENT HS (Sapan	Camatcilles Phase II, Mabalacat
S-40	S-59	SAN VICENTE-SAN FRANCISCO HS	San Vicente, Macabebe
S-41	S-62	ANGELES CITY NHS (Pampang)	Arayat Blvd., Pampang, Angeles City
S-42	S-63	ANGELES CITY NATIONAL TRADE SCHOOL	Sunset Valley, Cutcut, Angeles City
S-43	S-64	PAMPANGA HS	Jose Abad Santos, San Fernando
S-44	S-65	SINDALAN HS	Sindalan, San Fernando
S-45	S-68	BALITUCAN NHS (Annex)	San Pablo, Magalang
S-46	S-69	ANGELES CITY HS (Pandan)	Pandan, Angeles City
Tarlac 7 schools			
S-47	S-70	SAN MANUEL HS	Poblacion, San Manuel
S-48	S-71	GUEVARRA NHS	Guevarra, Gerona
S-49	S-73	BENIGNO S. AQUINO MEM. HS	San Nicolas, Poblacion, Concepcion
S-50	S-77	SANTO DOMINGO HS (CAPAS HS)	Dolores, Capas
S-51	S-81	PADAPADA HS	Padapada, Santa Ignacia
S-52	S-84	MALIWALO HS	Maliwalo, Tarlac City
S-53	S-85	VICTORIA HS	San Gabino, Victoria
Zambales 1 school			
S-54	S-86	GORDON HEIGHTS HS	K St., Gordon Heights, Olongapo City

(2) Setting up of Component Sizes for the Project

1) Calculation of the Number of Classrooms for Project Elementary Schools

For Project elementary schools selected by using the "Shortage" formula described in P 2-15 3) Selecting Project Schools ⑦, the number of classrooms to be planned should be calculated by the following method:

a) General Principles for Classroom Construction
In general principle for schools with 3 or more “classroom shortage”, 3 classrooms shall be planned. For schools with “classroom shortage” between 2 and 3, 2 classrooms should be planned. Even if the shortage of classroom is more than 3, if the school has a site limitation allowing the construction of only 2 classrooms, then 2 classrooms should be constructed.

b) Exceptions for Extremely Overcrowded Schools
The exception for very overcrowded schools with "Congestion degree" of more than 4 should be provided by setting the number of classrooms to be constructed after rounding off the calculated number of “Congestion degree” to the lowest whole number. But, the maximum limit of classrooms should be 6.

2) Calculation of the Number of Classrooms for Project Secondary Schools

For Project secondary schools, the "Congestion" formula (see P.2-13) was used for selecting the secondary schools for the Project. The number of "Congestion" formula should also be used for the calculation of the number of classrooms to be planned.

a) Calculation of the Number of Classrooms to be Planned
The number of classrooms to be planned should be the calculated number of “Congestion degree” after omitting the decimals.

b) Limits of Classroom Construction
In spite of the principles stated in “a)” above, if the results of using the " Congestion degree" calculation method is a number of 8 or more, the number of classrooms to be constructed shall still be 8. However, for schools where enrollment is more than twice the school capacity even after 8 classrooms would be added, 12 classrooms should be constructed, as an exception. If it is impossible to build 12 classrooms in a two storied building, a three storied building may be constructed.

Enrollment > [(existing classrooms)×40 + (8 × 45)] × 2

3) Other Facilities and Equipment

① Science Laboratories

One science laboratory will be built for each Project secondary school, only if the school does not have science laboratory and are not a recipient of the other Projects as shown in Table 2-5.

Table 2-5 Other Projects of Science Laboratory in the Past

	Project Name	Counterpart	Donor
1	Engineering & Science Education Project (ESEP)	DOST	WB
2	Secondary Education Development Project (SEDP)	DECS	ADB
3	Typhoon Resistance School Buildings Project (TRSBP)	DECS	JAPAN
4	Economic Support Fund (ESF)	DECS	USAID
5	Local Government Unit, or other domestic projects of the Philippines	—	—

② Toilets

a) Recipients of Toilets

Except for those that were built by other foreign donors, many toilets existing at the surveyed schools either have no water supply facilities or are broken. They are generally in unsanitary condition. As for numbers, there are approximately 1,100 toilet bowls for approximately 254,700 students at the candidate schools, which means one toilet per 231 students. DepEd's "Handbook on Educational Facilities" (1993) specifies one toilet for every 50 girls and one for every 100 boys. There is a large gap between the rule and the reality. In addition, a drastic increase in the number of students has made the toilet shortages more serious. Thus, toilets shall be installed at all schools selected for the Project. For those schools where the alloted land for construction is too narrow to layout both classrooms and toilets, only classrooms will be constructed for the schools. In a related issue, DepEd requested the Study Team to remove existing toilets and to install new ones. However, those existing toilets are still usable or only in need of minor repairs, and it is not considered appropriate to remove the existing toilets and install new ones.

b) Calculation of Toilet Units

As a basic principle, the Project should construct the number of toilet units in relation to the

number of classrooms constructed by the Project, but there are three standards regarding toilets for educational facilities in the Philippines, and according to DepEd, it has not been decided which standard should be applied. Informed that it would be sufficient if one of the standards were used, it was decided to use those found in the "DepEd Handbook" for the Project toilets, as they only require the minimum of toilet and urinal units compared to the other two standards. According to the "Handbook," a Project school having less than 4 new classrooms requires 1 toilet bowl in the boys lavatory and 2 toilet bowls in the girls lavatory. But considering that the unit cost of very small toilet is high, and that students in the old buildings can also use the new toilets, it was decided that 2 toilet bowls in the boys lavatory and 3 toilet bowls in the girls lavatory should be constructed to all the Project schools that has less than 6 new classrooms, as in phases I to V of the Project.

Number of toilet bowls and urinals according to the number of classrooms is shown in Table 2-8.

Table 2-6 Standards for Number of Toilet Facilities

Type \ Standard		Uniform Building Code	DepEd Handbook on Educational Facilities	DepEd Service Manual
Male	Toilet bowl	1 per 100 pupils	1 per 100 pupils	1 per 1 classroom
	Urinal (gutter)	1 per 60 pupils	1 per 100 pupils	1 per 2 classrooms
Female Water Closet		Elementary: 1 per 35 pupils Secondary: 1per 45 pupils	1 per 50 pupils	1 per 1 classroom
Handicapped Toilet		Needed	Needed	Needed

Table 2-7 Number of Toilet Facilities According to DepEd Handbook

Number of Classrooms		3	4	5	6	7	8	12
Male	Toilet bowl	0.68	0.90	1.13	1.35	1.58	1.80	2.70
	Urinal gutter (m)	0.68	0.90	1.13	1.35	1.58	1.80	2.70
Female toilet bowl		1.35	1.80	2.25	2.70	3.15	3.60	5.40

Note: calculated assuming 45 students per classroom and the equal number of boys and girls

c) Toilets for the Handicapped

Separate toilet facilities for the handicapped were constructed in phases I to V of the Project. However, for cost reduction purposes, one booth in the boys lavatory and one booth in the girls lavatory will be widened for wheelchair access so that both handicapped and non-handicapped

students can use them. Although ordinary toilet bowls are the squat (Asian) type, toilet bowls in the widened booths should be the western type for easy use by the handicapped. Table 2-8 shows the number of toilet units to the number of classrooms constructed by the Project.

Table 2-8 Number of Toilet Bowls and Urinals according to the Number of Classrooms to be Constructed by the Project

Number of classrooms to be constructed		6 and less	7 to 9	12
Toilet Type		Ts	Tm	Tl
Male	Toilet bowl, squat type	1	1	2
	Handicapped, western type	1	1	1
	Urinal gutter (m)	1.80	2.70	3.00
Female	Toilet bowl, squat type	2	3	5
	Handicapped, western type	1	1	1

③ Science Equipment

26 schools out of 54 secondary schools selected for the Project shall receive science equipment, providing that a school is not the recipient of any other project, as shown in Table 2-9. Although there are some Project schools that were constructed with science equipment before, either by individual donation or from local government subsidies, the covered items were limited, and they do not meet the DepEd Standards. So these schools except said school will not be regarded as overlapping with other donor projects.

For four (4) schools that have a science lab but no equipment, only science equipment will be procured. The quantity of science equipment is calculation based on the learning standards that the number of class students (45) is divided into 8 groups.

Table 2-9 Other Projects of Science Equipment in the Past

	Project Name	Counterpart	Donor
1	Engineering & Science Education Project (ESEP)	DECS	WB
2	Secondary Education Development Project (SEDP)	DECS	ADB
3	Secondary Education Instruments and Experiment Project (SEIEP)	DECS	Japan
4	Philippines-Australia Science & Mathematics Education Project (PASMEP)	DECS	Australia
5	Economic Support Fund (ESF)	DECS	USAID

④ School Furniture

All classrooms of the selected Project schools will be constructed with furniture. In addition, all science laboratories selected, in accordance with ①Science Laboratories (p.2-22) in this section, will be constructed with furniture for science laboratory.

The number of furniture units for secondary schools shall be calculated according to the "standard number of students in one classroom" which is 45. However, for elementary schools, a desk for two students will be used. Thus, an even number of 46 is used in the calculations for students in one classroom.

⑤ Policy for Overlapping with Other Donors

As previously mentioned, even if other donors provide assistance to the Project schools, construction of classrooms and toilets will still be included in the Project. However, for secondary schools, if other donors had covered any lab construction or equipment, neither the construction of science laboratories nor the procurement of science equipment will be included in the Project. Table 2-10 lists the policy details regarding overlapping with other donors.

Table 2-10 Policy on Overlapping with Other Donors' Projects

	Classrooms	Science Laboratory	Science Equipment	Toilet
TRSBP (Japan)	○	×	—	○
SEDP (ADB)	○	×	×	○
ESF (USA)	○	×	×	○
ESEP (WB)	○	×	×	○
PASMEP (Australia)	—	—	×	—
SEIEP (Japan)	—	—	×	—

○ : The items will be covered even though there is an overlapping.
× : The items shall not be covered in case there is an overlapping.
— : Not applicable

4) Number of Floors for Buildings

As a general principle, Project buildings shall be one-storied. If there are reasons like those described in Table 2-11, the buildings for these schools shall be two-storied. Further, if the planned number of classrooms is 12, the possibility of constructing a three-storied building shall be considered depending on the situations.

Table 2-11 Project Sites Where Two or Three Story Buildings will be Constructed

Reason of necessity of two or three story building	Two story building	Three story building
a) Schools with high number of shortage of classrooms and limited space for construction	E-05,E-06,E-11,S-05, S-07, S-09, S-11, S-16, S-19, S-25, S-49, S-51, S-71, S-73, S-81 S-84, S-86 (17 schools)	S-32, S-65 (2 schools)
b) Schools where some space should be remained for the future development of the school.	S-04, S-36, S-69 (3 schools)	S-17 (1 school)
c) Schools with high number of classroom shortage where most of existing school buildings are already 2 or more stories.	S-22, S-64 (2 schools)	S-34 (1 school)
d) Secondary schools where the construction space is too limited to build classrooms and science laboratory separately	S-15, S-57, S-58, S-62, S-68, (5 schools)	None
Total	27 (3 Elementary & 24 Secondary)	4 (4 Secondary)

Note: The old school ID are used in the table.

5) Special Cases for Setting the Components for Each School

When setting up the components at Project sites that have land limitations, some cases require a special determination. For example, site S-15 (in the following table) planned to have 3 classrooms and a science laboratory; but due to land restrictions, either two classrooms with a science laboratory in a two-storied building, or, three classrooms without a science laboratory in a one-storied building, should be constructed.

As specified in DepEd's "Curriculum for Secondary Education," experiment is very important in science classes. During phase I to V of the Project, science laboratories were constructed at those Project schools which had no labs, based on the "no exception" policy of one science laboratory for each secondary school. Following the spirit of this policy, science laboratory construction shall be included in the Project, even in special cases.

Table 2-12 Special Case in Setting Component

School	Planned component	Actual component if science laboratory is prioritized (Adopted)	Actual component if classroom is prioritized (Not adopted)
S-15 Guiginto National Voc'l HS	3 classrooms, a science lab. and a toilet	2 story 2 classrooms, a science lab. and a toilet	1 story 3 classroom and a separate toilet
S-62 Angeles City NHS (Pampan)	8 classrooms, a science lab. and a toilet	2 story 4 classrooms, a science lab. and a toilet	2 story 6 classroom and a separate toilet

Note: The old school ID are used in the table.

6) Project School Sites with Poor Ground Conditions

It was learned from the site surveys that some Project schools have soft soil and a high ground water table. Judging from the results of simple soil bearing tests, only one storied buildings can be constructed on such sites without using pile foundations. The bearing strength is not sufficient to construct two or more storied buildings on those sites and considering that any pile foundation work will result in increased construction costs, which shall be avoided in view of the limited funds for this program. For these reasons, one-storied buildings shall be constructed at those Project sites that have soft soil and a high ground water table. At sites S-14 (S-18) Obando NHS, S-16 (S-20) Marcero H. del Pilar NHS, and S-17 (S-21) San Marcos HS, (the number with parenthesis is the old number used during site survey) the construction of two-storied buildings is desirable for the most effective use of the land, but due to the aforementioned reasons, one-storied buildings will be constructed. (Refer to remarks column in Table 2-13)

7) Building Types

On the basis of a "2 classroom minimum" and an "12 classroom maximum" to be constructed per one Project school, the following building types are possible; Also, combining these building types to meet the conditions of each Project school is also possible.

Building Type	Symbol of Building Type
1. 2 classrooms	2
2. 3 classrooms	3
3. 4 classrooms	4
4. 6 classrooms	6
5. 2 story 4 classrooms	2-4
6. 2 story 6 classrooms	2-6
7. 2 story 8 classrooms	2-8
8. 2 story 2 classrooms, science laboratory, toilet	2-2+S+Ts
9. 2 story 4 classrooms, science laboratory, toilet	2-4+S+Ts
10. 2 story 6 classrooms, science laboratory, toilet	2-6+S+Ts
11. 3 story 9 classrooms	3-9
12. 3 story 12 classrooms	3-12
13. science laboratory and toilet (small)	S+Ts

14.	science laboratory and toilet (medium)	S+Tm
15.	science laboratory and toilet (large)	S+Tl
16.	toilet (small)	Ts
17.	toilet (medium)	Tm
18.	toilet (large)	Tl

8) Project Components

The number of classrooms and other components per school is planned by the methods described in P2-21, “(2) Setting up of Component Sizes for the Project." However, plans do not always meet the realities of construction specs or available space at every site. Thus, the actual amount of components must be reduced if the proposed locations for new buildings are too small. It was examined how many and how large facilities can be built in each of these sites. Table 2-13 is the result of this examination which shows the components for rooms, equipment and floor area per Project school.

Table 2-13 (1) Scale of Entire Project (31Elementary Schools)

New ID number	Old ID number	Name of School	Planned number of class-rooms	Number of Classrooms to be constructed	Building Type	Number of stories	Toilet's Size	Floor Area (㎡)	Remarks
Bataan									
E-01	E-01	MAMBOG ES	3	2	2	1	-	127.05	2 classrooms will be constructed due to the limited space.No toilet will be constructed. Special type foundation is required because of the soft ground.
E-02	E-03	ORANI NORTH ES	3	3	3, T	1	S	220.05	Special type foundation is required because of the soft ground. Special septic tank will be installed due to high groundwater table.
Bulacan									
E-03	E-04	BUSTOS ES	3	3	3, T	1	S	220.05	
E-04	E-05	BUNSURAN ES	6	4	2-4, T	2	S	396.10	4 classrooms will be constructed due to the limited space
E-05	E-06	MATIAS B. SALVADOR MEM. ES	4	4	2-4, T	2	S	396.10	
E-06	E-08	SIBUL ES	3	3	3, T	1	S	220.05	
E-07	E-09	OBANDO CS	3	3	3, T	1	S	220.05	Special type foundation is required because of the soft ground. Special septic tank will be installed due to high groundwater table.
E-08	E-10	BAGONGBUHAY EAST CS	3	3	3, T	1	S	220.05	
E-09	E-11	SAN RAFAEL ES (BBH ES)	4	4	2-4, T	2	S	396.10	
Nueva Ecija									
E-10	E-14	BONGABON CES	3	3	3, T	1	S	220.05	
E-11	E-16	VEGA ES	3	3	3, T	1	S	220.05	
E-12	E-17	LIGAYA ES	3	3	3, T	1	S	220.05	
E-13	E-19	SAN FELIPE ES	2	2	2, T	1	S	157.05	
E-14	E-21	ANDRES BONIFACIO NORTE ES	2	2	2, T	1	S	157.05	
E-15	E-28	CABUCBUCAN ES	3	3	3, T	1	S	220.05	
E-16	E-30	MACAPSING ES	2	2	2, T	1	S	157.05	Special type foundation is required because of the soft ground.
E-17	E-31	PACO ROMAN ES	2	2	2, T	1	S	157.05	
E-18	E-32	SANTA ROSA CS	3	3	3, T	1	S	220.05	
E-19	E-33	PAG-ASA ES	3	3	3, T	1	S	220.05	
E-20	E-34	SOLEDAD ES	3	3	3, T	1	S	220.05	Special type foundation is required because of the soft ground.
E-21	E-36	BALOC ES	3	3	3, T	1	S	220.05	
E-22	E-38	ZARAGOZA CS	3	3	3, T	1	S	220.05	
E-23	E-39	ALIAGA CS	3	3	3, T	1	S	220.05	
E-24	E-40	CABANATUAN EAST CS	3	3	3, T	1	S	220.05	
E-25	E-41	CAMP TINIO ES	3	3	3, T	1	S	220.05	
E-26	E-42	MAGSALISI ES	2	2	2, T	1	S	157.05	
Pampanga									
E-27	E-45	SANTA ANA CES	3	3	3, T	1	S	220.05	
E-28	E-47	EPZA Resettlement ES	3	3	3, T	1	S	220.05	
Tarlac									
E-29	E-48	MORIONES ES	3	3	3, T	1	S	220.05	
Zambales									
E-30	E-54	BALOGANON ES	3	3	3, T	1	S	220.05	
E-31	E-55	SUBIC CS	3	3	3, T	1	S	220.05	
Total			93	90				6,941.70	

2：2 classrooms、3：3 classrooms、2-4：2-story 4 classrooms, T: Toilet

Toilet Size S：Small、M：Medium、L：Large

Table 2-13 (2) Scale of Entire Project (54 Secondary Schools)

New ID number	Old ID number	Name of School	Planned number of class-rooms	Number of Classrooms to be constructed	Building Type	Number of stories	Toilet's Size	Science Lab.	Science Equip-ment	Floor Area (㎡)	Remarks
Bataan											
S-01	S-01	Don PABLO R. ROMAN Memorial HS (Pilar HS	4	4	4, T	1	S			283.05	
S-02	S-03	BONIFACIO CAMACHO HS	4	4	4, T	1	S			283.05	Special septic tank will be installed due to high groundwater table.
S-03	S-04	BATAAN NHS	8	8	2-8, T	2	M			706.55	
S-04	S-05	PAGALANGGANG NHS	8	8	2-8, ST	2	M	●	●	801.43	
S-05	S-07	HERMOSA HS	8	8	2-8, T	2	M		●	706.55	
S-06	S-08	LIMAY NHS	6	6	6, T	1	S			409.05	
S-07	S-09	ORANI NHS	5	4	2-4, ST	2	S	●	●	490.98	4 classrooms will be constructed due to the limited space
Bulacan											
S-08	S-10	ALEXIS G. SANTOS NHS	5	5	2, 3, T	1	S			347.10	
S-09	S-11	BUNSURAN HS	6	4	2-4, T	2	S			396.10	4 classrooms will be constructed due to the limited space
S-10	S-13	TALIPTIP HS	12	12	6, 6, ST	1	L	●	●	897.28	Special type foundation is required because of the soft ground. Special septic tank will be installed due to high groundwater table.
S-11	S-15	GUIGUINTO NATIONAL VOCATIONAL HS	3	2	2-2ST	2	S	●	●	367.99	2 classrooms will be constructed due to the limited space and policy for prioritizing science lab.
S-12	S-16	FELIZARDO C. LIPANA MEM. HS	8	8	2-8, T	2	M			706.55	
S-13	S-17	MEYCAUAYAN HS	12	12	3-12, ST	3	L	●	●	1,189.78	
S-14	S-18	OBANDO NHS	8	2	2, ST	1	S	●	●	251.93	Single story building andsSpecial type foundation is required because of the soft ground. Special septic tank will be installed due to high groundwater table.
S-15	S-19	MAGUINAO-CRUZ NA DAAN HS	8	8	2-8, T	2	M			706.55	
S-16	S-20	MARCELO H. DEL PILAR HS	12	4	4, T	1	S			283.05	Single story building andsSpecial type foundation is required because of the soft ground. Special septic tank will be installed due to high groundwater table.
S-17	S-21	SAN MARCOS HS	8	4	4, T	1	S			283.05	Single story building andsSpecial type foundation is required because of the soft ground. Special septic tank will be installed due to high groundwater table.
S-18	S-22	SAN MIGUEL HS	8	8	2-8, T	2	M			706.55	
S-19	S-24	PARADISE FARMS HS	4	4	4, ST	1	S	●	●	377.93	
S-20	S-25	SAPANG PALAY HS	8	8	2-8, ST	2	M	●	●	801.43	
Nueva Ecija											
S-21	S-27	GENERAL TINIO NHS	8	8	2-8, T	2	M		●	706.55	
S-22	S-28	BAGO HS	2	2	2, ST	1	S	●	●	251.93	
S-23	S-30	PEÑARANDA NHS	3	3	3, T	1	S			220.05	
S-24	S-31	RIZAL NHS	4	4	4, T	1	S			283.05	
S-25	S-32	CABIAO HS	12	9	3-9, T	3	M			851.27	9 classrooms will be constructed due to the limited space
S-26	S-34	NUEVA ECIJA HS	12	12	3-12, T	3	L			1,094.90	
S-27	S-36	JUAN R. LIWAG MEM. HS	8	8	2-8, T	2	M			706.55	
S-28	S-37	GUIMBA NHS	8	6	4, 2, ST	1	S	●	●	504.98	6 classrooms will be constructed due to the limited space. Special type foundation is required because of the soft ground.
S-29	S-39	PALAYAN CITY HS	3	3	3, T	1	S			220.05	
S-30	S-41	AGBANNAWAG HS	2	2	2, ST	1	S	●	●	251.93	
S-31	S-42	SAN FRANCISCO HS	4	4	2, 2, T	1	S			284.10	
S-32	S-44	CONSTANCIO PADILLA NHS	4	4	4, T	1	S			283.05	
S-33	S-45	SANTO DOMINGO NATIONAL TRADE SCHOO	8	8	4, 4, T	1	M		●	543.25	
S-34	S-48	ZARAGOZA NHS	3	3	3, T	1	S			220.05	
S-35	S-49	PUTLOD NHS	6	6	2-6, T	2	S			547.75	
S-36	S-87	CARRANGLAN HS (Annex A - Digdig)	3	3	3, ST	1	S	●	●	314.93	
Pampanga											
S-37	S-53	CAMBA HS	6	6	6, T	1	S			409.05	
S-38	S-57	MAUAQUE RESETTLEMENT HS	8	4	2-4, ST	2	S	●	●	490.98	2 classrooms will be constructed due to the limited space and policy for prioritizing science lab.
S-39	S-58	CAMATCHILES RESETTLEMENT HS	8	8	2-6, 2-2ST	2	S	●	●	885.74	
S-40	S-59	SAN VICENTE-SAN FRANCISCO HS	5	3	3, T	1	S			220.05	Special type foundation is required because of the soft ground. Special septic tank will be installed due to high groundwater table. 3 classrooms will be constructed due to the limited space
S-41	S-62	ANGELES CITY NHS (Pampang)	8	4	2-4ST	2	S	●	●	519.64	4 classrooms will be constructed due to the limited space and policy for prioritizing science lab.
S-42	S-63	ANGELES CITY NATIONAL TRADE SCHOOL	8	8	4, 4, ST	1	M	●	●	638.13	
S-43	S-64	PAMPANGA HS	8	8	2-8, T	2	M			706.55	
S-44	S-65	SINDALAN HS	12	12	3-12, ST	3	L	●	●	1,189.78	
S-45	S-68	BALITUCAN NHS (Annex)	6	6	2-6ST	2	S	●	●	671.29	
S-46	S-69	ANGELES CITY HS (Pandan)	8	8	2-8, T	2	M			706.55	
Tarlac											
S-47	S-70	SAN MANUEL HS	6	6	3, 3, T	1	S			410.10	
S-48	S-71	GUEVARRA NHS	8	8	2-8, T	2	M			706.55	
S-49	S-73	BENIGNO S. AQUINO MEM. HS	8	8	2-8, T	2	M		●	706.55	Special septic tank will be installed due to high groundwater table.
S-50	S-77	SANTO DOMINGO HS (CAPAS HS)	12	12	6, 6, ST	1	L	●	●	897.28	Special type foundation is required because of the soft ground.
S-51	S-81	PADAPADA HS	8	8	2-8, T	2	M			706.55	
S-52	S-84	MALIWALO HS	8	8	2-8, ST	2	M	●	●	801.43	
S-53	S-85	VICTORIA HS	8	8	4, 4, ST	1	M	●	●	638.13	
zambales											
S-54	S-86	GORDON HEIGHTS HS	8	2	2-2ST	2	S	●	●	367.99	2 classrooms will be constructed due to the limited space and policy for prioritizing science lab.
Total			378	335				22	26	29,952.68	

2：2 classrooms, 3：3 classrooms, 4：4 classrooms, 5：5 classrooms, 6：6 classrooms, 2-4：2-story 4 classrooms, 2-6：2-story 6 classrooms, 2-8：2-story 8 classrooms

3-9：3-story 9 classrooms, 3-12：3-story 12 classrooms

2-2ST：2-story 2classrooms＋Science Laboratory＋Toilet, 2-4ST：2-story 4 classrooms＋Science Laboratory＋Toilet, 2-6ST：2-story 6 classrooms＋Science Laboratory＋Toilet

ST：Science Laboratory＋Toilet, T: Toilet

Toilet Size S：Small, M：Medium, L：Large

2-2-2-2 Site and Layout Plan

Conditions at the construction sites of the Project vary from school to school. Thus, the most suitable building layout plan for each Project school shall be prepared by examining the conditions of each site, including the existing infrastructure and present layout of the existing school buildings. Site maps and layout plans of Project schools are attached as Appendix-8. The main policies of the building layouts are described below:

1) The layout of the new buildings shall be planned so that they will harmonize with the overall school plan and the existing buildings.
2) For the safety of the building structures, they shall be laid out on land having a good and uniform soil condition. Buildings shall be arranged on flat land and avoid being on sloped areas as much as possible.
3) They shall be laid out with sufficient clearance between them, and for purposes of allowing the wind to provide as much natural ventilation as possible, take the predominant wind direction into account.
4) Building location shall avoid such areas that are prone to natural disasters, such as falling trees during typhoons and flooding or landslides during heavy rain. If a Project school has to use such an area for new building construction, the Philippine side shall take the appropriate preventative measures, such as removing trees or branches, providing adequate land reclamation and retaining walls, etc.
5) New buildings shall be carefully laid out so that they do not interfere with existing buildings, and so that the electricity, water and drainage can be installed economically. In particular, at sites where the public water supply is not available, the layout of toilets and science laboratories shall be planned carefully, taking into consideration the location of an existing or future water well that will be provided by the Philippine side.
6) At those sites where the construction of single storied buildings are not possible due to limited space, two or three storied buildings shall be planned.
7) Basically, toilets and science laboratories shall be laid out separately from classroom buildings; in proximity to other buildings for easy access, but also in such a way that special attention is given to the surrounding environment to avoid the possibility of odors(for example, locating toilets near a school entrance gate should be avoided). If classrooms and toilets have to be planned in one building due to space limitations, openings to the toilet facilities like entrance doors and air ventilation blocks shall be directed away from the classrooms.
8) Considering the climate conditions in the Philippines, classroom buildings shall be laid

out in an east-west direction, except for sites that have space limitations.

9) The school building(s) should be laid out in such a way so as to keep school ground as much as possible to encourage outdoor activities for the students and community activities for area residents.

2-2-2-3 Architectural Plans

(1) Building Components

In accordance with the new building standards of DepEd, the room sizes in the Project buildings should be 7m×9m for classrooms (standard of 45 students), and 7m×13.5m for science laboratories (standard of 45 students). Thus, the structural module of the buildings is to be 7m×4.5m. A classroom is designed with 2 modules and a science laboratory with 3 modules. By arranging interior concrete column faces flush with the interior wall surface, each interior can be of rectangular shape without any projections inside the room. Therefore, furniture can be conveniently placed in the room. For both elementary and secondary schools, one movable partition will be installed between two classrooms to enable multi-purpose utilization of the rooms. Because the classrooms will be used in the rainy seasons, 1.6m wide corridors with canopies will be built outside of the classrooms.

For secondary schools, the science laboratory and the toilet shall be arranged in one building to centralize the water supply facilities (classrooms do not have any water supply). A workbench with 5 sinks will be built below the windows inside the science laboratories. A sloped access for the handicapped shall be installed to each building entrance and a special toilet booth for the handicapped shall be installed in each male and female toilet area.

(2) Cost Reduction Plans

Basic building design plan in this phase requires, at every step, preparation to keep costs lower. As a general premise, the plans followed in phases I to V of the Project cannot be used as is and need to be changed or re-developed. As mentioned in 2-2-1 (7), the restructured TEEP specification is emerging as the basic design standard in the DepEd; and the Project, while retaining the safety standards of the designs, will also continue to look for additional ways to reduce costs.

In general, the old TEEP (1998-2000) followed the old classroom size standards while the restructured TEEP (2001-2004) follows the new size standards. A lot of items, including the operation systems of the Project, also changed when the restructured TEEP was adopted,

but some quality problems still exist in some of the old TEEP buildings. (the restructured TEEP hasn't actually constructed anything yet, as of June, 2002). For example, a) Cracks may easily occur because there were no crack control joints on the floors or walls, b) The roof drain downspouts go into the columns which is slowly eroding the column structures, and c) Caulking for the windows are incomplete and they leak when it rains.

These problems shorten the life span of the buildings and are relatively expensive to repair as well. Therefore, it is very important to pay attention to these kinds of issues and to maintain a certain quality level in the Project construction.

There are some Project school sites with insufficient bearing capacity of the ground for building construction. Pile driving is needed for two or three storied buildings on such sites. Buildings on such sites should be single storied in order to save construction costs.

The following methods were applied to reduce the Project costs:

① Reducing the quantity of construction material by reviewing structural designs;
② Reducing the quantity of construction material by lowering the floor height;
③ Reducing the foundation sizes due to the lightened dead load of the buildings;
④ Canceling the toilet ceilings, ceiling fan outlets and hallway lighting fixtures;
⑤ Reviewing the construction base and construction organization;
⑥ Reviewing the supervising organization.

Table 2-14 shows the result of the cost reduction for the Project compared among different Projects.

Table 2-14 Comparison of Construction Unit Cost

Project Name	Construction Year	Direct Cost/ Construction Floor Area (Yen／㎡)	Direct Cost/ Construction Floor Area (Peso／㎡)
ESF (USAID)	1982－1992	Approx. 36,700	－
SEDP (ADB)	1988－1995	14,000～17,000	－
TRSBP (Japan)	1989－1994	70.000～100,000	14,000,～20,000
EFIP I to V (Japan)	1993－2000	49,000～54,000	13,000～16,000
TEEP (WB, JBIC)	1999－2004	17,000～18,000	5,000～6,000
EFIP VI	2003－2004	17,000～26,000	6,000～10,000

Note: Different exchange rates (yen-peso) are adopted according to each implementation time.

(3) Architectural Plans

1) Floor Plans

As the size of the classroom changes from 8m×7m to 7m×9m in this Project, locating columns on the four corners of the classroom as in phases I to V of the Project is not productive from an economic point of view. The structural modules should be 7m×4.5m for the Project. Additional columns should be arranged in the middle of the longer span allowing the cross section of the beam to be smaller, thereby making the structure more economical. In phases I to V of the Project, steel columns were used to support the corridor canopy. However for this phase, the depth of the canopy is designed to be shallower. Thus, the canopy can be supported by cantilever beams, so steel columns and their foundations can be eliminated.

Below are the provisions for two (2) exits as stipulated in the National Building Code and Fire Code of the Philippines that should be taken into consideration during preparation of the plans:
Under the National Building Code, Section 1207 – Stairs, Exits and Occupant Loads stipulated as follows;

- (b)-(1) Number of Exits: In all occupancies, floors above the first story having an occupant load of more than 10 shall not have less than two exits…

Under Fire Code, Division 8 – Section 3.801 (B)-(7) Exit Arrangement stipulates as follows;

- Exits shall be arranged so that at least two (2) separate exits will be available from every floor area…

Thus, in accordance with the Fire Code of the Philippines, two staircases shall be installed.

2) Section Plans

The Basic Design Study revealed that most of the existing school buildings had a floor height between 2.7m and 3.0m. As many school buildings have no ceilings, the temperatures in the classrooms are high because of radiant heat from the roof, and this hinders learning. The floor height in phases I to V of the Project was 3.47m in order to improve room environment. In order to reduce building construction costs, the ceiling height for this phase of the Project shall be lowered from 3.47m to 2.8m, the same as in the restructured TEEP standards, and by modifying the roof structure and installing sloped ceilings (ceiling height

is from 2.7m to 3.7m, and the average is 3.2m), a sufficient amount of air volume may be maintained in the classrooms. Windows in the classroom walls shall be installed as tall as possible for effective use of natural lighting and ventilation. Installing sloped ceilings does sacrifice the amount of space in the attic and reduces insulation capability, but it also allows fresh air to come into the attic space through the openings above the beam, and by convection, releases warm air through the slit at the top of the roof, so radiant heat being transmitted into the room is prevented.

As for toilets, the ceiling and insulation that had been installed during phase I to V of the Project shall be cancelled by taking the cost reduction policy into consideration. It is expected that the temperature inside the toilet may increase because of the direct heat radiation from the roof. In order to ease the heat problem, ventilating louver blocks shall be installed in the upper part of the walls and openings shall be made between beams and roof to maintain ventilation as much as possible. The openings may allow rainwater coming into the toilets during typhoon, but it is not considered as a major problem as Typhoon does not continue long period of time.

The standard cross section of a Project school building is shown in Fig. 2-3.