

Chapter 2 Contents of the Project

Chapter 2. CONTENTS OF THE PROJECT

2-1 Basic Concept of the Project

(1) Overall goal and the Project purpose

In Mozambique, primary education system consists of five years of first level education (EP1) and two years of second level education (EP2) and net enrollment for primary school is 62.6 percent (2002). Only 46.2 percent of enrolled schoolchildren move up to the final grade of EPI (first to fifth grades)(1998-99). Many problems have to be solved so that all children may have the opportunity to have primary education. It should be noted that the country's annual population growth rate is 2.2 percent (2000). In view of the increase in enrollment of primary schools (average for the period from 1998 to 2002)--every year nearly 190,000 children reach school age, it is necessary to increase 3,800 primary teachers every year. In actuality, however, the annual number of graduates of teacher training institutions is less than 1,800. In addition, the percentage of unqualified primary teachers is on the increase (38.6 percent in 2002). It is urgently necessary, therefore, to enhance the country's primary education system, both in quantity and in quality.

Under such circumstances, the Government of the Republic of Mozambique gives the highest priority to education in its "National Five-Year Plan 2000-2004." It has set "Gradual shift from the CFPP to the IMAP", "Establishment of Teacher Support Resource Centers" and "Continuous support for the IMAP System" as its goals in the field of training of primary school teachers.

The Government of the Republic of Mozambique intends to establish an IMAP in each province and train a total about 2,200 new students every year through the "Education Sector Strategic Plan 1999-2003."

At present, there are three provinces-- Niassa Province, Manica Province and Gaza Province-- which still do not have an IMAP. In Gaza Province, for which the project is proposed, in particular, the situation has been improved considerably, as the number of primary school pupils per teacher is 59.2 (2002), while the target ratio set by the Ministry of Education of the Republic of Mozambique is 50. On the other hand, however, the percentage of unqualified primary teachers in the province is 52.2 percent (EP-1/2002), 52.1 percent (EP-2/2002) which is the highest in the country. This represents a continuing serious shortage of teachers.

(2) The outline of the Project

This Project aims to convert Xai-Xai CFPP to IMAP by rehabilitating existing deteriorated

facilities, constructing additional facilities in need, and procuring necessary educational equipment.

2-2 Basic Design of the Requested Japanese Assistance

2-2-1 Design Policy

(1) Basic Plan

This project is aimed primarily at rehabilitating the Xai-Xai CFPP's existing facilities. The basic design policy for this project is therefore to create an educational environment as defined by the IMAP standards by rehabilitating the existing facilities to recover their initial functions as part of an IMAP and constructing a minimum number of necessary facilities. Facility components included in the IMAP standards have already been identified by the Ministry of Education. The status of the existing facilities is as shown in the following table.

Table 2-1 The Condition of Existing Facilities against the Standard of IMAP

Standard Facilities	Existing Facilities	Standard Facilities	Existing Facilities
Administration Building	Yes	Canteen Building	Yes
Teachers Building	Yes	Male Accommodation Building	Yes
Library	Yes	Female Accommodation Building	Yes
Clinic	No	Teacher Accommodation Building	Yes
Classroom Building	Yes	Garage	Yes
Laboratory Building	No	Electrical Building	Yes
Teacher Support and Resource Center Building	No	Pump, Elevated Tank Building	Yes
Multi Purpose Building	No	Guard Building	No

The existing facilities are not located in a consistent manner, as the result of their repeated extension in the past. Under this project, an administrative zone and a learning zone are to be set up, both facing the hill which is to serve as the core directly accessible from outside. This arrangement will help the two zones to keep their independence.

On the other hand, dormitories, lodging houses for teachers and administration staff are to be located around the learning zone so that these facilities may be free from the effects of school activities. This arrangement will help students, teachers and administration staff to keep their private and public lives separate.

Shown below is the outline of positioning of the projected facilities

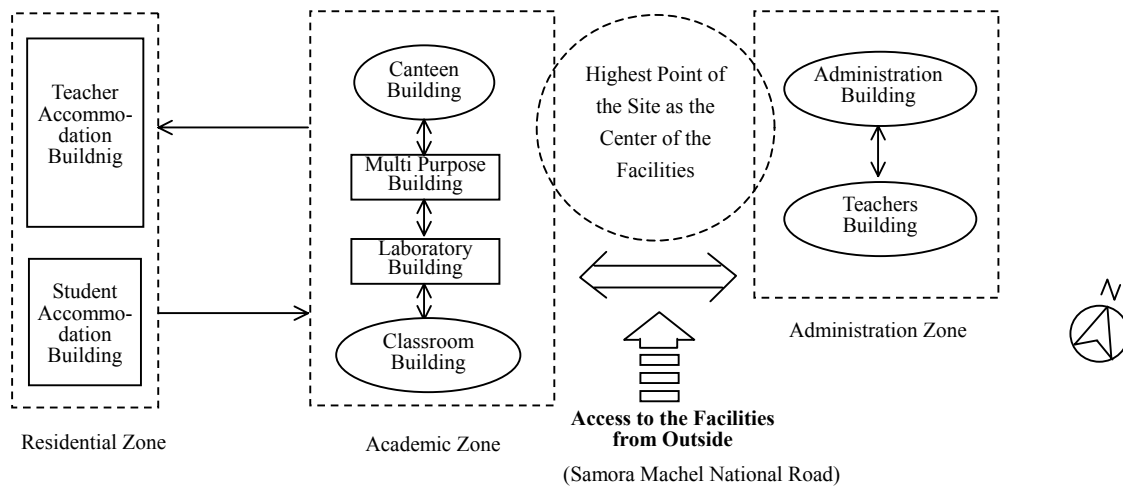


Figure 2-1 Outline of Facilities Arrangement

In light of the present financial condition of the Government of the Republic of Mozambique, particular emphasis should be placed on minimization of costs of facility maintenance and management through effective use of natural conditions in designing the projected facilities.

The equipment plan for this project should focus on the need to procure a minimum set of instruments for learning and practical training. Instruments for practical training, in particular, are to be procured giving due consideration to their consistency with the details of practical training in music, art, physical education, and natural science. It is assumed that those existing equipment which are still usable are to be used after completion of this project.

(2) Natural Conditions

The coastal plateau, where Xai-Xai City is located, has a high temperature and high humidity climate. The highest temperature often exceeds 30°C. In winter, on the other hand, the temperature drops to about 10°C. The existing facilities are well suited for natural air conditioning. The facilities plan for this project will take advantage of this characteristic of the existing facilities to minimize temperature control by the use of air conditioners which may increase costs of operation and management. According to the Directorate of Construction and School Equipment, Ministry of Education (DCEE), there is no record of earthquakes and other natural disasters in and around the project site. Since the ground of the project site is sandy, it will be necessary to take measures to protect slopes against erosion by rainwater.

The average bearing capacity of soil in the project site, is less than 5 tons/m², which indicates poor

ground conditions. Under this project, therefore, all facilities to be newly built should be single-story structures. As sewer is not connected to the project site, waste water is to permeate through the ground. Soil permeability in and around the project site is low despite the sandiness of the ground. A field survey shows that soil permeability is decreasing further due to the rise in the groundwater level, which was caused by floods (occurred) during the past few years. For this reason, a method of wastewater disposal should be figured out carefully paying special attention to its possible effect on the surroundings.

(3) Socio-economic Conditions

In Mozambique, many foreign countries are providing financial assistance on a continual basis as a result of political stability that followed the termination of the civil war. As a consequence, the financial condition of the country has been relatively stable in recent years. Since budgetary appropriations for the IMAPs are limited, however, it will be necessary to reduce costs of operation and management in consideration of the budgets for other IMAPs.

About 10 households have been illegally occupying both sides of the paths within the project site since the outbreak of the civil war, and have formed a community. In light of the relatively large scale of the community, the Provincial Directorate of Education in Gaza has decided not to order these households out and has granted them the right to use the area. The project site has a large area of about 13.5 ha. The implementation of this project will therefore have no adverse effect on the residents of local communities, including the illegal occupants. The fences to divide the illegally occupied portion and the project site are to be constructed by the Government of the Republic of Mozambique.

(4) Local Construction Industry

In Mozambique most construction materials except for cement, aggregate and wooden products are imported. Construction materials produced in and imported from South Africa, which are widely used in the country, will be used in this project. Those which are suitable for renovation of the existing facilities and construction of new facilities are to be procured.

Mozambique has its own building standards. Unrevised for a long time, however, these building standards do not reflect recent situation of construction. For this reason, selection of design standards is left to architects' discretion. Because of the need to make architectural design consistent with building materials to be used, however, the South African Building Standards (SABS) are often selected. The design work for this project will also be conducted in accordance with the SABS.

Before commencement of the project, the Ministry of Education shall apply for a temporary permit to the Public Works Department in advance, it would take several weeks for approval. Upon completion of construction work, the Ministry of Education report the Government of the Republic of Mozambique.

(5) Local Contractors

For ease of maintenance and management of the projected facilities after completion of this project, the Japanese contractor will use the services of local contractors as its subcontractors. The construction work is to be carried out using a construction method commonly used in the country as well as building materials that can be procured in the country.

(6) Project Implementing Organization of the Mozambique side

When this project is implemented, it is necessary for the Implementing Agency to promptly make banking arrangements and follow the procedures for budgetary appropriations for the work to be carried out by the Government of the Republic of Mozambique as well as the procedures for tax exemption. In the case of this project, the site of which is located more than 200 kilometers away from Maputo City where the Ministry of Education is located, there might be delays in these procedures. For this reason, a system for maintaining close communication with the Ministry of Education is to be created.

Upon completion of the project, facilities operation expenses and a part of personnel expenses are to be defrayed directly from the provincial government's budget. Since the budget amount for facilities operation, in particular, is limited, the projected facilities are to be so designed as to minimize such expenses and financial burden on the provincial government.

(7) Grading of the Facilities and Equipment of the Project

1) Facilities

Since this project includes renovation of the existing facilities and construction of a multipurpose hall, laboratories, a teacher support resource center, etc., the grade of facilities and individual items of equipment should be set in a manner that secures the minimum functions required for an IMAP.

2) Equipment

Those items of equipment now in use at other IMAPs were procured based on the list of equipment that meet the IMAP standards. In the course of selecting individual items of equipment and deciding on purchasing quantities and details of consumables and attachments, the following criteria of grading,

which were set with reference to the list, are to be fulfilled.

- ① Consistent with the IMAP standards. Example: sizes of desks and chairs for students and beds in dormitories.
- ② Equivalent in quality to those commonly used in other IMAPs.
- ③ Hand-operated basic items of equipment for practical training.

(8) Construction Method, Procurement of Materials and Construction period

Mozambique's construction industry is small in scale and most of the construction materials used in the country are imports. There is only a limited number of skilled construction workers. Under such circumstances, architectural designs that require high precision in execution will likely cause delays in construction work. For the smooth implementation of the construction work, therefore, construction materials which can be easily procured in the country and a method of construction which is equivalent to those commonly used in the country are to be used.

Of electrical equipment and equipment for use in training, those which are to be maintained and managed while in use and those which require the use of consumables are to be procured in South Africa for ease of maintenance and management after completion of this project.

As it will take at least one month to complete the procedures for exempting imported materials from customs duty, the schedule of work should be coordinated through detailed prior discussions with the Implementing Agency so that there may be few delays in construction work.

2-2-2 Basic Plan

2-2-2-1 Facilities Plan

(1) Rationale for Deciding the Number of Students

The number of students is to be decided based on the standard number of IMAP students. The Ministry of Education has set the official number of students of each IMAP at 420 in consideration of the IMAP's personnel system and the financial capability of each provincial Directorate of Education. In some cases, IMAP could be established by reorganizing the existing primary teacher training centers. In this case, if the official number of students is to be applied, it will be necessary to construct additional facilities, which may

impose an economic burden. In actuality, therefore, the Ministry of Education allows the number of students to vary from 400 to 420 depending on the size of the existing facilities to be reconstructed.

In the case of the Xai-Xai CFPP, for which this project is to be proposed, it has male dormitories with a capacity of 200 students, and a total of 12 general classrooms, have been built and are still usable. When these classrooms are to accommodate a total of 400 students, the number of students per class is about 33 (400/12). The figure falls within the range of 30 to 40 set by the Ministry of Education. Therefore, if the number of 400 is applied as the number of students for IMAP, it will not be necessary to extend existing facilities such as classrooms and male dormitories. For these reasons, the number of students of the IMAP is appropriate to be 400 in this project.

The number of primary school pupils per teacher in Gaza Province was 59.2 in 2002, which comes closer to the target ratio of 50 set by the Ministry of Education. On the other hand, however, the number of unqualified primary teachers is expected to increase. According to a tentative calculation carried out as part of "Strategy for Teacher Education 2002-2004," it is expected that the shortage of qualified primary teachers will continue in Gaza Province and even all the other provinces until the period of execution of " Strategy for Teacher Education 2005-2015."

In Gaza Province, the number of new ESG1 graduates, who qualify for the IMAP entrance examination, was 2,920 in 2002. According to the Ministry of Education, in the other provinces more than 4,000 ESG1 graduates applied for the IMAP entrance examination while only 200 were accepted. This means that not only new ESG1 graduates but also a considerably large number of former ESG1 graduates take the IMAP entrance examination. One of the reasons for so many ESG1 graduates applying for the IMAP entrance examination is that IMAP is a boarding school with free meals and that IMAP graduates are guaranteed ample employment opportunity and incomes higher than the national average.

As is clear from the above descriptions, it is certain that in Gaza Province the shortage of primary teachers and the upward trend in the number of applicants for the IMAP examination will continue for some time to come. In light of the managerial capability of the provincial Directorate of Education, the Ministry of Education set the official number of students of the new IMAP in the province at 400. Judging from the states the other existing IMAPs are operated, the figure is reasonable.

(2) Rationale for Deciding the Number of Teachers

The number of teachers, which determines the scale of the administration department, is to be calculated based on the IMAP curriculum. In the case of compulsory subjects, the number of teachers is to be calculated on the assumption that the number of lecture during the term--the first or the second term--when the total number of lecture is at most. According to the IMAP curriculum, the total number of lecture is longer during the first term for each grade. The number of classes should be six for each grade.

The IMAP curriculum is as follows:

Compulsory Subject	First Year				Second Year				Total Number of Lecture	Required Number of Teacher (15-20 hours/teacher)	Teacher for Elective Subject	Total Number of Teacher
	First Term, Lecture/week	Second Term, Lecture/week	Number of Class	Maximum Number of Lecture	First Term, Lecture/week	Second Term, Lecture/week	Number of Class	Maximum Number of Lecture				
History of Education and General Didactics	3	3	6	18	3	2	6	18	36	2		2
Educational Psychology	3	3	6	18	3	2	6	18	36	2		2
Sociology in Education	2	2	6	12				12	12	1		1
School Organization and Supervision					2	2	6		12	1		1
Teaching Method of Portuguese	5	5	6	30	5	5	6	30	60	3		3
Teaching Method of Physical Education		2	6	0	2		6	0	12	1	1	2
Teaching Method of Musical Education	2	2	6	12				12	12	1	1	2
Teaching Method of Visual and Technological Education					2	2	6		12	1	1	2
Bantu Language	3		6	18				18	18	1	1	2
English	3	3	6	18				18	18	1	1	2
Teaching Method of History	3	3	6	18				18	18	1		1
Teaching Method of Geography					4	4	6		24	2		2
Civil Education	2	2	6	12	2	2	6	12	24	2		2
Health and Hygiene in Education					3	3	6		18	1		1
Teaching Method of Mathematics	5	5	6	30	5	4	6	30	60	3		3
Teaching Method of Natural Science and Biology	2	2	6	12	2	2	6	12	24	2		2
Total	33	32		198	33	28		198	396	25		30

Elective Subjects	Remarks
Portuguese	
English	
Bantu Language	
Social Science / Civil Education	
Natural Science	
Musical Education	
Physical Education	
Visual / Technological Education	Visual / Pottery / Handicraft / Dressmaking

The necessary number of teachers to teach compulsory subjects is to be calculated by dividing the total number of lectures during the term with a longer total number of lectures by 15-20 hours , which is the weekly total length of instruction for each teacher.

In the case of subjects such as physical education, music, art, Bantu and English, one full-time teacher is assigned for each subject when it is taught as compulsory. Therefore, it is necessary to assign an additional teacher for each of these subjects when it is taught as optional so that lectures may be given as scheduled.

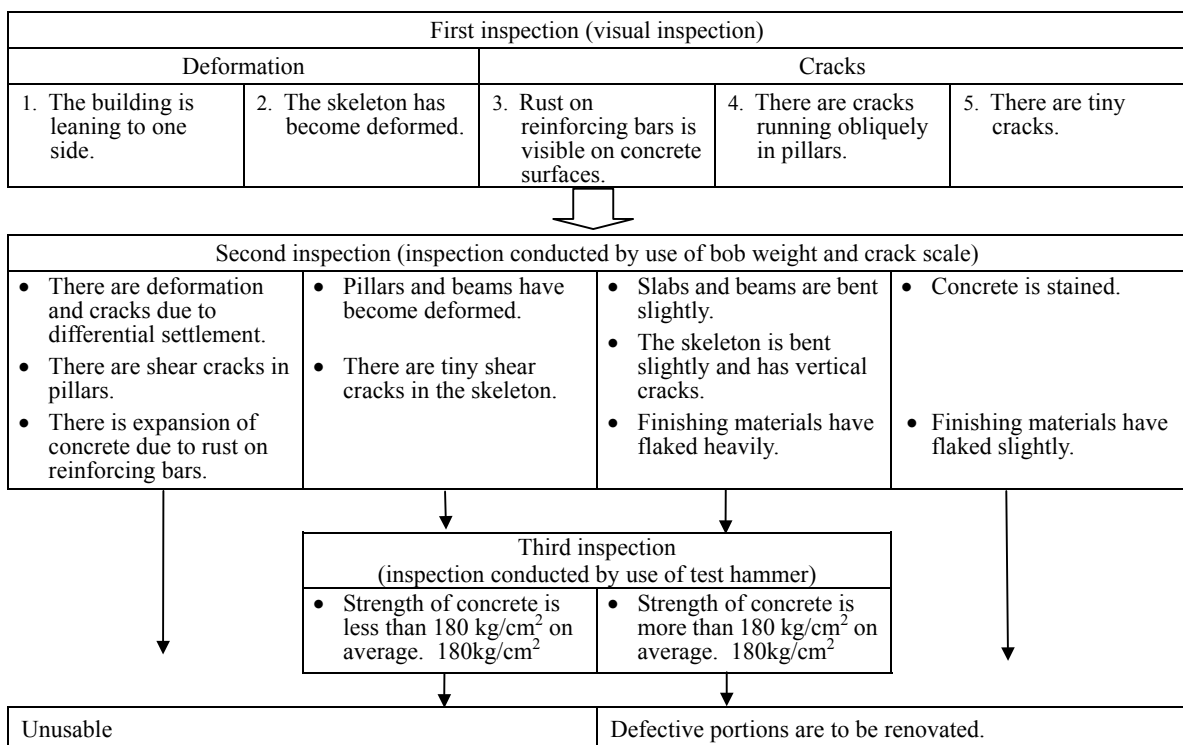
As a result of calculations made based on the above-mentioned assumption, the total necessary number of teachers is 30.

(3) Determination of the Degree of Superannuation of the Existing Facilities

At the project site the administration building, the female accommodation buildings, the canteen building, are concentrated around on the plateau, and the male accommodation buildings and the teacher accommodation buildings are scattered on its western slope. All the existing facilities are faced with such problems as leaks in the roofs, broken fixtures and failures in plumbing equipment. Only in one of the female accommodation buildings a structural defect was found. This means that all the other existing facilities can be reused if they are renovated. In the case of the female accommodation building where a structural defect was found, the floors inclined significantly due to structural cracks in the floors which were caused by differential settlement. This building should not be included in this project since it is very difficult to repair this building for reuse.

Shown below is the flow of the work to determine the degree of superannuation of the existing facilities.

Flow of the Work to Determine the Degree of Superannuation of the Existing Facilities



Results of the Work to Determine the Degree of Superannuation of the Existing Facilities

Facilities	Survey Result	Content
Administration Building	Renovation of Defectives (Degree of Defects is Medium)	Renovation required on Floor (except corridor), Finishing of Exterior and Interior Walls, Doors and Windows, Ceiling, Truss, Roofing Materials, Electrical, Mechanical facilities
Classroom Building (1)	Renovation of Defectives (Degree of Defect is High)	Renovation required on Floor, Finishing of Exterior and Interior Walls, Doors and Windows, Ceiling, Truss, Roofing Material, Electrical and Mechanical facilities, Toilet is not repairable
Classroom Building (2)	Renovation of Defectives (Degree of Defects is Medium)	Renovation required on Floor (except corridor), Finishing of Exterior and Interior Walls, Doors and Windows, Ceiling, Truss, Roofing Materials, Electrical, Mechanical facilities
Classroom Building (3)	Renovation of Defectives (Degree of Defects is Medium)	Renovation required on Floor (except exterior or corridor), Doors and Windows, Ceiling, Roofing Materials, Electrical and Mechanical facilities
Canteen Building	Renovation of Defectives (Degree of Defect is High)	Wait on room, Pantry, Food Storage (1), (2), Corridor (3), Toilet, Kitchen and Washing area are not repairable. Renovation required on Floor, Finishing of Exterior and Interior Walls, Doors and Windows, Ceiling, Truss, Roofing Materials, Electrical and Mechanical facilities
Male Accommodation Building (1)	Renovation of Defectives (Degree of Defect is High)	Renovation required on Floor of Existing Building, Finishing of Exterior and Interior Walls, Doors and Windows, Ceiling, Truss, Roofing Materials, Electrical and Mechanical facilities. Toilet is not repairable.
Male Accommodation Building (2)	Renovation of Defectives (Degree of Defect is High)	Renovation required on Floor of Existing Building, Finishing of Exterior and Interior Walls, Doors and Windows, Ceiling, Truss, Roofing Materials, Electrical and Mechanical facilities. Toilet is not repairable.
Female Accommodation Building (1)	Renovation of Defectives (Degree of Defect is High)	Renovation required on Floor, Finishing of Exterior and Interior Walls, Doors and Windows, Electrical and Mechanical facilities. Toilet is not repairable.
Female Accommodation Building (2)	Not repairable	
Teacher Accommodation Building (1A/1B)	Renovation of Defectives (Degree of Defect is High)	Renovation required on Floor, Finishing of Exterior and Interior Walls, Doors and Windows, Electrical and Mechanical facilities.
Teacher Accommodation Building (2)	Renovation of Defectives (Degree of Defect is High)	Renovation required on Floor, Finishing of Exterior and Interior Walls, Doors and Windows, Electrical and Mechanical facilities.
Teacher Accommodation Building (3)	Renovation of Defectives (Degree of Defect is High)	Renovation required on Floor, Finishing of Exterior and Interior Walls, Doors and Windows, Electrical and Mechanical facilities.
Teacher Accommodation Building (4)	Renovation of Defectives (Degree of Defect is High)	Renovation required on Floor, Finishing of Exterior and Interior Walls, Doors and Windows, Electrical and Mechanical facilities.
Garage (1)	Renovation of Defectives (Degree of Defect is Low)	Renovation required on Defective Doors.
Electrical Building (1)	Renovation of Defectives (Degree of Defect is Medium)	Renovation required on Floors, Finishing of Exterior and Interior Walls, Doors and Windows. And remove Defective Doors.

Degree of defect - low: superannuated but poses no practical problems; less necessity of renovation

Degree of defect - medium: available only for temporary use; in need of renovation

Degree of defect - high: badly superannuated; in urgent need of renovation

(4) Site/Facilities Plan

The project site is situated on the northern side of Samora Machel National Highway which runs eastward from Xai-Xai City to Inhambane. It is surrounded by residential districts. There are sign peg and shrubberies, which indicate site boundaries for the project site. It is possible, therefore, to draw clear boundary lines between the project site and the neighboring lots. The project site borders on the national highway. The paths running within the project site are about six meters wide and therefore there will be no vehicular traffic problem within the project site.

Facilities to be constructed under this project will be placed along the contour lines on the western slope, to avoid any difference in level within the building. Facilities such as Teacher Support and Resource Center and Clinic, which will be frequently utilized by visitors, are to be located in which are easily accessible and manageable. Multi Purpose Building, which will likely be used often as the place for ceremonies, meetings and so on, should have a shape which can be easily recognized, and be located in the center of the project site. Public facilities are to be placed along the circle in the center of the project site and the accommodation zone is to be located on the northern and southern sides of the western slope.



Figure 2-2 Site/Facilities Plan

(5) Architectural Plan

1) Floor Plan

If it is possible to reuse the existing facilities, which meet the IMAP standards in terms of both function and scale, these facilities are to be reused as much as possible. On the other hand, however, those facilities which are not included in the existing facilities have to be constructed newly. And on the

basis of the results of the examination for the request made by the Government of the Republic of Mozambique and the investigation of the Xai-Xai CFPP's existing facilities and related infrastructure, it was decided to newly construct a Laboratory building, a Toilet building, a Multi Purpose building, Female accommodation buildings, a Guard building, a Garage, a Pump building and an Electrical building under this project.

In the existing facilities which are to be renovated, additional partitions cannot be constructed since the bearing capacity of underground soil and substructure are unknown. Therefore, the areas of the existing rooms are to be used as they are now. The area of each facility to be newly constructed is to be determined in accordance with the IMAP standards, while the area of the electric room is to be calculated in accordance with the standards set by Mozambique Electric Power Corporation (EDM) and for the number of sanitary fittings to be installed in the toilet building is to be calculated in accordance with the National Plumbing Code (NPC) of the United States. Summarized below are the rationale for determining the scale of each of the rooms to be installed in the existing facilities to be renovated and those to be newly built.

① Administration Building (to be renovated)

This building is for the use of the Head Master, Pedagogical Head-1, the other managers and the clerical workers. The existing administration building consists of two office rooms, the Head Master office, the Pedagogical Head's-1 office, the Accounting Head's office, toilet rooms and corridors.

Table 2-2 Rooms in Administration Building

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Office (1)	51.93		Room for the use of the staff of Administration Dept., Maintenance and Management Office, etc. To be renovated without any changes in the scale of the room.
Office (2)	35.68		Room for the use of the staff of Accounting Dept. To be renovated without any changes in the scale of the room.
Head Master's Office	32.49		To be renovated room without any changes in the scale of the room .
Pedagogical Head-1 Office	16.25		To be renovated without any change in floor space.
Accounting Head Office	16.25		To be renovated without any change in floor space.
Toilet	19.44		To be renovated without any change in floor space. Layout of toilet seats, urinals, booths, as well as plumbing, to be changed.
Others	52.79		Porches and exterior corridors
Total	224.83		

② Teachers Building (to be renovated; toilets to be newly constructed)

One of the Female Accommodation Buildings is to be renovated and converted into a Teachers Building. The building is mainly for the use of teachers making preparations for their lecture. The building is to be provided with a library and a clinic, both of which are for the use of students. The Teachers Building is to consist of four teachers' rooms, a small meeting room, a teaching material room, a library, a book storage room, a clinic, a storage and toilets. The standard floor space specified in the IMAP standards is 6.6 m²/person for teachers' room, 56 to 82 m² for library, and 33 m² for clinic. The floor space planned for each of these rooms differs from the standard floor space because all these rooms are to be made by renovating existing buildings.

Table 2-3 Rooms in Teachers Building

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Teacher's Room (1)-(4)	223.44		This is an office room for the use of a total of 30 teachers. Since a section of one of the existing Female Accommodation Bldgs. can accommodate 6 to 8 teachers, a total of 4 teachers' rooms are to be constructed under this project. (6.98 m ² to 9.31 m ² /person)
Small Meeting Room	55.86		To be used for meetings attended by about half of the total number of teachers. (3.1 m ² /person)
Teaching Material Rm.	55.86		To be used by teachers for production of teaching material.
Library	55.86		To be equipped with desks and chairs for the use of 24 students and a counter for the librarian.
Book Storage	55.86		To have a floor space large enough to house up to 2,400 books. To be attached to the library.
Clinic	55.86		To service not only students but also community residents. To be equipped with 1 examination table and 2 beds and other necessary items of equipment. To be located in a place which is easily accessible.
Storage	55.86		One of the existing lavatories is to be converted into a storehouse to house teaching material and office supplies.
Toilet (Including Corridor)		78.40	Since it is impossible to renovate the existing toilet, a new one, part of which is to serve as handicapped toilet, is to be constructed.
Total	558.60	78.40	

③ Classroom Building (1) (to be renovated; Toilets are to be newly constructed)

One of the existing classroom buildings is to be renovated so that it may be used for teaching compulsory subjects to a total of 136 students. It is to consist of a House Master's room, 4 classrooms, 1 storage and toilets. The standard floor area for classroom is 1.8 m² to 2.3 m².

Table 2-4 Rooms in Classroom Building (1)

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
House Master Room	36.48		To be renovated without any change in floor space and function.
Classroom (1)-(4)	316.01		To be renovated without any change in floor space and function. To be renovated as general classrooms. Each classroom is to accommodate a total of 34 students. The floor space per person will therefore be 2.32 m ² .
Storage	60.91		Existing toilet to be renovated to store classroom equipment, teaching material and cleaning equipment.
Toilet (Including Corridor)		73.92	Since it is impossible to renovate the existing toilet, a new one is to be constructed.
Others	7.94		Porch
Total	421.34	73.92	

④ Classroom Building (2) (to be renovated)

One of the existing classroom buildings is to be renovated so that it may be used for teaching compulsory subjects to a total of 132 students. It is to consist of 4 classrooms, 1 teaching material room, 1 custodial room, 2 storages, and interior and exterior corridors.

Table 2-5 Rooms in Classroom Building (2)

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Classroom (5)–(8)	235.53		To be renovated as classroom to accommodate a total of 33 students. The floor space of each room is about 58.8 m ² and therefore the floor space per person is 1.78 m ² .
Storage (1), (2)	24.96		One of the existing toilets, which it is no longer usable, is to be converted into a storage to store classroom equipment and teaching material.
Teaching Material Room	15.70		The existing storage with its door facing the classroom is to be converted into a storage to store teaching material only.
Custodial Room	7.00		The existing toilet, which is no longer usable, is to be converted into a storage to store cleaning equipment.
Others	227.67		Interior and exterior corridors.
Total	510.86		

⑤ Classroom Building (3) (to be renovated)

One of the existing classroom buildings is to be renovated so that it may be used for teaching compulsory subjects to a total of 132 students. It is to consist of 4 classrooms, 1 teaching material room, 1 custodial room, 2 storages, and interior and exterior corridors.

Table 2-6 Rooms in Classroom Building (3)

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Classroom (9)–(12)	235.53		To be renovated as classroom to accommodate a total of 33 students. The floor space of each room is about 58.8 m ² and therefore the floor space per person is 1.78 m ² .
Storage (1), (2)	24.96		One of the existing toilets, which it is no longer usable, is to be converted into a Storage to store classroom equipment and teaching material.
Teaching Material Room	15.70		The existing storage with its door facing the classroom is to be converted into a storage to store teaching material only.
Custodial Room	7.00		The existing toilet, which is no longer usable, is to be converted into a storehouse to store cleaning equipment.
Others	227.67		Interior and exterior corridors.
Total	510.86		

⑥ Laboratory Building (to be newly constructed)

A laboratory building is to be newly constructed. It is to consist of 1 musical education room, 3 preparation rooms, 1 natural science education room, 1 technology education room, 1 visual education room, and exterior corridors. The technology education room is to be used for training in woodworking, metalworking, sewing, and pottery.

Table 2-7 Rooms in Laboratory Building

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Musical Education Room		97.47	To accommodate a total of 34 students, who are homeroom students. The floor space is about 97.5 m ² so that the room may have a space for demonstration of musical instruments and also one for a staff notation blackboard.
Preparation Room (1)		24.37	To store musical instruments and teaching materials, which are likely to get scattered and lost. To serve also as room for making preparations for lecturing.
Natural Science Education Room		97.47	To accommodate a total of 34 students for basic experiment. The floor space is about 97.5 m ² so that the room may have a space for laboratory table and sink.
Preparation Room (2)		24.37	To store experimental equipment and teaching material, which are likely to get scattered and lost. To serve also as room for making preparations for lecturing.
Technology Education Room		97.47	To be used for training in woodworking, metalworking, sewing, weaving and pottery. The floor space is 97.5 m ² so that the room may be divided into training sections.
Visual Education Room		97.47	The floor space is 97.5 m ² so that the room may have special oil/watercolor painting demonstration spaces.
Preparation Room (3)		48.74	To store equipment and teaching material for use in the technology education room and the visual education room as well as works of art and handicraft. To serve also as room for making preparations for lecturing.
Others		162.44	Exterior corridors
Total		649.80	

⑦ Teacher Support and Resource Center Building (to be newly constructed)

In an attempt to deal with the fact that the number of new graduates of the IMAPs does not match that of primary school pupils, the Ministry of Education plans to establish a teacher support and resource center in each IMAP as a distance learning course for obtaining qualifications equivalent to those granted to IMAP graduates, as part of " Strategy for Teacher Education

2002-2004." Under the plan, eight tutors are to be stationed at Pedagogical Nuclear in each province, which serves as the center for training teachers in service. In Gaza Province, 8 tutors are to be appointed for 8 Pedagogical Nuclears and at each Pedagogical Nuclear a total of 25 teachers in service are to take this course.

The total floor space of the Teacher Support and Resource Center should be suitable to accommodate all necessary items of equipment, a coordinator (an IMAP staff member), a tutor and a total of 12 to 25 teachers in service who take the course, and a teaching material production room.

Table 2-8 Rooms in Teacher Support and Resource Center Building

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Teacher Support and Resource Center Room		73.27	To be used mainly for production of teaching material for the distance learning course. To be used temporarily for practical training for teacher in the course accompanied by their tutor. The coordinator (IMAP staff member) is to coordinate the training program. It is assumed that 12 to 25 teachers in service will take the course at a time.
Teaching Material Production Room		24.42	To be used for reproduction or production of teaching material necessary for retraining of teachers in service.
Others		10.55	
Total		108.24	

⑧ Toilet Building (to be newly constructed)

A toilet building for users of Classroom Building -2, Classroom Building -3, Laboratory Building, Teacher Support and Resource Center is to be newly constructed. It is to consist of toilets for male students, toilets for female student and exterior corridors. There will be toilets for students in three places--the first attached to Classroom Building (1), the second attached to Multi Purpose Building, and the third located in this building. The appropriate total number of sanitary fittings is to be determined in accordance with the National Plumbing Code (NPC) of the United States, assuming that the ratio between male and female students will be approximately 50:50. The number of each type of sanitary fittings, which varies with the use of the building, is to be determined based on the estimated number of users. On the assumption that the projected buildings are mainly school buildings and dormitories and that main users of these buildings are students, a comparison of the planned number of sanitary fittings and that specified in the NPC are as follows.

Table 2-9 Necessary Number of Sanitary Fittings as Defined by NPC

Classroom	This Project					NPC				
	WC	Urinal	Lavatory	Shower	Washing	WC	Urinal	Lavatory	Shower	Washing
Classroom Building (1)										
Male	2	2	3	-	-	2	2	3	-	-
Female	3	-	3	-	-	3	-	3	-	-
Toilet Building										
Male	4	6	3			4	6	3		
Female	8	-	3			8	-	4		
Multi Purpose Building										
Male	2	2	2			2	2	2		
Female	3		2			3	-	2		
	22	10	16	-	-	22	10	17	-	-
Male (1)	5	5	5	6	12	5	5	5	-	-
Male (2)	5	5	5	6	12	5	5	5	-	-
Female	9	-	12	13	24	10	-	12	-	-
	19	10	22	25	48	20	10	22		

Toilet seats for male students are to be installed in 8 places, urinals in 10 places, lavatory for male students in 8 places, toilet seats for female students in 14 places, and lavatory for female students in 8 places. The number of sanitary fittings to be installed in each of these places was determined based on the number of classrooms to adjoin each of these sanitary facilities. Four classrooms are to adjoin toilets to be attached to Classroom Building (1). (The number of classrooms is 23 percent of the total number of classrooms which can be used for teaching.) The rooms to adjoin toilets to be attached to Multi Purpose Building are two laboratories and one multi purpose building (23 percent), and those to adjoin Toilet Building are eight classrooms and two laboratories (54 percent). The number of sanitary fittings to be installed in the above-mentioned places were determined on the basis of these percentages.

Table 2-10 Rooms in Toilet Building

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Male Toilet		32.60	To be newly constructed for male students and guests who will utilize the facilities of Classroom Building (2), Classroom Building (3), Laboratory Building and Teacher Support and Resource Center Building. On the assumption that the total number of these students and guests will be 115, toilet seats are to be installed in 4 places, urinals in 6 places, and lavatory in 3 places. As to sanitary fittings for the use of the remaining 85 persons, toilet seats are to be installed in 4 places, urinals in 4 places and lavatory in 5 places, within Classroom Building – 1 and within Multi Purpose Building. This arrangement will be sufficient to meet the demand for sanitary fittings.
Female Toilet		32.60	To be newly constructed for female students and guests who will utilize the facilities of Classroom Building (2), Classroom Building (3), Laboratory Building and Teacher Support and Resource Center Building. On the assumption that the total number of these students and guests will be 115, toilet seats are to be installed in 8 places, laboratory in 3 places. As to sanitary fittings for the remaining 85 persons, toilet seats are to be installed in 6 places, urinals in 5 places, and lavatory in 6 places within Classroom Building (1) and Multi Purpose Building. This arrangement will be sufficient to meet the demand of sanitary fittings.
Others		57.01	Exterior corridor
Total		122.21	

⑨ Multi Purpose Building (to be newly constructed)

A multi purpose building to be used for meeting, ceremonies, concerts and physical training is to be newly constructed. It is to consist of a multi purpose hall, teachers' rooms, three storages, toilets for male students, toilets for female students, toilets for teachers, and interior and exterior corridors.

Table 2-11 Rooms in Multi Purpose Building

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Multi Purpose Hall		311.04	Seating capacity: 300; 200 for students and 100 for teachers and guests; to be used as venue for ceremonies like entrance ceremony, graduation ceremony, other assemblies, concerts; to be used for physical training--martial art, mat exercises, etc.--at ordinary times.
Teacher's Room		15.60	To be used as waiting room for guests, performers and physical education teachers.
Storage (1)		19.44	To house equipment for use in indoor physical training.
Storage (2)		25.92	To house a total of 100 chairs for the use of teachers and guests on the occasion of ceremonies and other assemblies, as well as platform.
Storage (3)		19.44	To house equipment for use in outdoor physical training (football, basketball).
Male Toilet		25.92	To be equipped with 2 toilet seats, 2 urinals and 2 lavatories.
Female Toilet		14.00	To be equipped with 3 toilet seats and 2 lavatories.
Teacher's Toilet		2.8	To be attached to the teacher's room.
Others		143.28	
Total		577.44	

⑩ Canteen Building (To be renovated but Kitchens are to be newly Constructed)

Due to the shortage of canteen space in the existing facilities, the lectures just before and after the lunch time are disturbed.

The present canteen is to be expanded upto existing kitchen space, and new kitchen and food storage is to be constructed near by.

Existing canteen will be renovated to accommodate 200 students at same time.

Table 2-12 Rooms in Canteen Building

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Canteen (1)	161.34		A space to accommodate a total of 400 students in rotation--a total of 200 students at a time--is required. But the existing canteen can accommodate up to 140 students at a time. Therefore, the existing kitchen which is no longer usable is to be converted into a canteen capable of accommodating a total of 60 students at a time.
Canteen (2)	85.31		The existing kitchen which is no longer usable is to be converted into a canteen capable of accommodating a total of 60 students at a time.
Equipment Rom (1) • (2)	24.41		The existing toilet and storage, both of which are no longer usable, are to be converted into a storage to store kitchen utensil.
Storage (1)	23.56		The existing refrigerator room which is no longer usable is to be converted into a storage to store maize which is the staple food in the country.
Wait on Room		12.18	Meals are to be first served into dishes and then handed to students.
Pantry		8.12	To store dishes, bowls, spoons, forks, and other eating utensils.
Food Storage (1) • (2)		24.40	To store meat and vegetables.
Toilet		12.20	For the use of staff members who work in Canteen Building. Each toilet is to be equipped with a toilet seat for males, a toilet seat for females and a lavatory.

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Kitchen		68.01	It is assumed that timber will be used as heat source. From the standpoint of safe smoke extraction, it should be a simple facility consisting of concrete pillars and steel plate roofs.
Washing		14.48	An dishwashing area is to be constructed as an annex to Kitchen Building.
Others	39.64	28.42	Porch, interior corridor, and exterior corridor.
Total	334.26	167.81	

- ⑪ Male Accommodation Building (1) (to be renovated; but a toilet and a laundry are to be newly constructed)

Since the planned IMAP is a boarding school, it is necessary to have dormitory buildings to accommodate all students. The existing male accommodation building is to be converted into Male Accommodation Building (1), which is to accommodate a total of 100 male students. It is to consist of 8 rooms, 2 storages, 2 lavatory rooms, 2 porches, for renovation. 1 toilet room, 1 shower room and a laundry are to be newly constructed.

Table 2-13 Rooms in Male Accommodation Building (1)

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Bed Room (1) - (8)	321.33		To be renovated without any change in total floor space. Each room, equipped with double-deck beds, is to accommodate 12 to 14 students so that the building will be able to accommodate a total of 100 students. The floor space per person will be 2.88 to 3.37 m ² .
Storage (1) • (2)	30.10		The existing toilet is to be converted into a storage.
Lavatory Room	42.58		The existing toilet and shower room are to be converted into a lavatory.
Toilet		49.27	The existing toilet, which will be very difficult to renovate. Therefore, a toilet equipped with a shower is to be newly constructed. Toilet seats are to be installed in 5 places, urinals in 5 places, and showers in 6 places.
Others	12.73	33.50	Porch and interior corridor, laundry
Total	406.74	82.77	

- ⑫ Male Accommodation Building (2) (to be renovated; but a toilet and a laundry are to be newly constructed)

Since the planned IMAP is a boarding school, it is necessary to have dormitory buildings to accommodate all students. The existing male accommodation building is to be converted into Male Accommodation Building (2) which is to accommodate a total of 96 male students. It is to consist of 8 rooms, 2 storage, 2 lavatory rooms, and 2 porches for renovation. 1 toilet room, 1 shower room and a laundry are to be newly constructed.

Table 2-14 Rooms in Male Accommodation Building (2)

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Bed Room (9) - (16)	321.33		To be renovated without any change in total floor space. Each room, equipped with double-deck beds, is to accommodate 12 students so that the building will be able to accommodate a total of 96 students. The floor space per person will be 3.37 m ² .
Storage (1) • (2)	30.10		The existing toilet is to be converted into a storage.
Lavatory Room	42.58		The existing toilet and shower room are to be converted into a lavatory rooms. lavatories are to be newly installed in 5 places.
Toilet		49.27	The existing toilet, which it will be very difficult to renovate. Therefore, a toilet equipped with a shower is to be newly constructed. Toilet seats are to be installed in 5 places, urinals in 5 places, and showers in 6 places.
Others	12.73	33.50	Porch and interior corridor, laundry
Total	406.74	82.77	

⑬ Female Accommodation Building (1) (to be newly constructed)

Since the planned IMAP is a boarding school, it is necessary to have dormitory buildings to accommodate all students. One of the existing Female Accommodation Buildings, is to be converted into a Teachers Building and the other is to be excluded from this project. Female Accommodation Building (1), which is to be newly constructed, is to accommodate a total of 108 students. It is to consist of 9 bed rooms, 1 entrance hall, 1 shower room, toilets, 1 laundry, exterior corridors.

Table 2-15 Rooms in Female Accommodation Building (1)

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Entrance Hall		68.40	From the standpoint of safety, female students to reside in this building are to meet and talk with visitors such as their families and friends in the entrance hall. They will also talk with each other here.
Bed Room (1)~(9)		365.76	A total of 9 rooms are to accommodate a total of 108 students on the basis of 12 students per room. Since beds are all double-deck beds, the floor space per person is 3.39 m ² .
Shower Room (1)		30.60	Every student is to use the shower room for a 15 minutes at a time. On the assumption that 4 students will use the shower room for an hour and that the peak time of use of the shower room will last 4 hours, a total of 7 booths (108 /16) are to be installed.
Toilet (1)		28.39	A total of 5 toilet seats and a total of 6 lavatories are to be installed.
Others		221.38	Exterior corridor and laundry
Toilet		714.53	

⑭ Female Accommodation Building (2) (to be newly constructed)

Since the planned IMAP is a boarding school, it is necessary to have dormitory buildings to accommodate all students. This building is to accommodate a total of 96 students. It is to consist of 8 bed rooms, 1 shower room, toilets, 1 laundry, exterior corridors.

Table 2-16 Rooms in Female Accommodation Building (2)

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Bed Room (10)~(17)		325.12	A total of 8 rooms are to accommodate a total of 96 students on the basis of 12 students per room. Since beds are all double-deck beds, the floor space per person is 3.39 m ² .
Shower Room (2)		28.89	Every student is to use the shower room for a 15 minutes at a time. On the assumption that 4 students will use the shower room for an hour and that the peak time of use of the shower room will last 4 hours, a total of 6 booths (96 /16) are to be installed.
Toilet (2)		19.90	A total of 4 toilet seats and a total of 6 lavatories are to be installed.
Others		216.02	Exterior corridor and laundry
Total		589.93	

⑮ Teacher Accommodation Building (1A/1B) (to be renovated)

The existing facility is to be renovated and converted into a Teacher Accommodation Building. It is to consist of 1 living room, 3 bedrooms, 1 storages, 1 kitchen, 1 toilet.

Table 2-17 Rooms in Teacher Accommodation Building (1A/1B)

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Living Room	17.21		To be remodelled without any change in total floor space. This building is suitable for a family of four to six.
Bed Room (1)	10.53		
Bed Room (2)	8.27		
Bed Room (3)	8.13		
Kitchen	8.77		
Back Room	1.92		
Toilet	4.25		
Others	27.08		Balcony, porch, interior corridor
Total	86.16		
1A/1B Total	172.32		

⑯ Teacher Accommodation Building (2A/2B) (to be renovated)

The existing facility is to be renovated and converted into an IMAP Teacher Accommodation Building. It is to consist of 1 living room, 1 kitchen, 3 bedrooms, and 1 toilet.

Table 2-18 Rooms in Teacher Accommodation Building (2A/ 2B)

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Living Room • Kitchen	32.29		To be remodelled without any change in total floor space. It is suitable for a family of four to six.
Bed Room (1)	8.34		
Bed Room (2)	7.34		
Bed Room (3)	8.34		
Toilet	5.87		
Others	5.19		Corridor
Total	67.37		
2A/2B Total	134.74		

⑰ Teacher Accommodation Building (3A/3B) (to be renovated)

The existing facility is to be renovated and converted into an IMAP teacher accommodation building. It is to consist of 1 living room, 1 kitchen, 3 bedrooms and 1 toilet.

Table 2-19 Rooms in Teacher Accommodation Building (3A/3B)

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Living Room • Kitchen	32.29		To be remodeled without any change in total floor space. It is suitable for a family of four to six.
Bed Room (1)	8.34		
Bed Room (2)	7.34		
Bed Room (3)	8.34		
Toilet	5.87		
Others	5.19		Corridor
Total	67.37		
3A/3B Total	134.74		

⑱ Teacher Accommodation Building (4) (to be renovated)

The existing facility is to be renovated and converted into an IMAP teacher accommodation building. It is to consist of 2 living rooms, 4 bedrooms, 1 kitchen, 3 toilets and 1 back room.

Table 2-20 Rooms in Teacher Accommodation Building (4)

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Living (1)	25.70		To be remodeled without any change in total floor space. As it has 2 living rooms, 4 bedrooms, 3 toilets and 1 kitchen, it is to be used as a house for 2 families, with a separate living room and a kitchen for common use.
Living (2)	25.70		
Bed Room (1)	22.11		
Bed Room (2)	17.05		
Bed Room (3)	17.42		
Bed Room (4)	22.39		
Kitchen	21.23		
Toilet (1)	5.24		
Toilet (2)	2.90		
Toilet (3)	7.91		
Back Room	2.16		
Others	27.75		Terrace, interior corridor
Total	197.56		

⑲ Teacher Accommodation Building (5A-5F/6A-6F/7A-7D) (to be newly constructed)

As the renovating of the existing facilities will not be sufficient, new facilities are to be constructed. At the existing CFPP, a total of 26 staff members, 10 use accommodation buildings, while 9 are living in rented houses in Xai-Xai City, unable to use accommodation buildings. Therefore, at present, the necessary number of houses is 19. The percentage of the number of staff

members who are in need of housing is 73 percent (19/26). Those who are living in rented houses in Xai-Xai City are not granted housing allowance. As there are few vacancies in the campus, they have been forced to put up with inconvenience for a long time. The total necessary number of teachers calculated based on the curriculum is 30, to which four senior staff members are added. Thus the IMAP is to have a staff of 34.

If this figure is multiplied by 0.73, the total necessary number of houses is 24 (34 x 0.73, fractions omitted).

As there are a total of 8 houses which will be reusable if remodelled, a total 16 houses (in 3 accommodation buildings) are to be newly facilitated so that a total of 24 new houses may be procured. Each of new houses is to consist of 1 living room, 2 bed rooms, 1 back room, 1 kitchen, 1 toilet and 1 laundry.

Table 2-21 Rooms in Teacher Accommodation Building (5A-5F/6A-6F/7A-7D)

Name of Room	Floor Area of Renovation (m ²)	Floor Area of New Construction (m ²)	Remarks
Living Room		15.23	Each unit is to have a total floor space of 52.50 m ² . It is suitable for a family of about four. It may also be used as a unit for two single persons.
Bed Room (1)		11.93	
Bed Room (2)		11.93	
Back Room		1.20	
Kitchen		5.51	
Toilet		3.50	
Laundry Room		2.01	
Others		1.20	Interior corridor
Sub-Total		52.50	Total floor area of one unit
Total		840.00	Total floor area of 16 units

⑳ Guard Building (to be newly constructed)

This facility, which is to be newly constructed as the guard's office where a guard is to be stationed, is to be located at the entrance gate. Its floor space is 8.0 m².

㉑ Garage (1) (to be renovated)

This facility is to house 2 vehicles, each of a size similar to that of a pickup truck. Only its door is to be renovated without any change in floor space. Its floor space is 50.19 m².

㉒ Garage (2) (to be newly constructed)

This facility is to house a microbus. Its floor space is 42.75 m².

㉓ Electrical Building (1) (to be renovated)

This building is to continue its function to provide electricity to the existing storage/laundry building and the chicken raising building. It is to be renovated without any change in floor space,

which is 24.0 m².

②④ Electrical Building (2) (to be newly constructed)

This facility is to provide electricity to the other facilities to be newly constructed and are to be constructed under this project. Its floor space is 3.36 m².

②⑤ Pump Building (to be newly constructed)

A pump building where a pump for letting city water into the receiving tank and then sending it to the elevated tank is to be newly constructed. Its floor space is 35.0 m².

Shown below is the floor area of each of the projected facilities, which was calculated in accordance with the results of the above-mentioned examination.

Table 2-22 Floor Area of Each Building

Building Name	Floor Area of Renovation		Floor Area of New Construction		Total	
Administration Building	224.83	m ²			224.83	m ²
Teachers Building	558.60	m ²	78.40	m ²	637.00	m ²
Classroom Building (1)	421.34	m ²	73.92	m ²	495.26	m ²
Classroom Building (2)	510.86	m ²			510.86	m ²
Classroom Building (3)	510.86	m ²			510.86	m ²
Laboratory Building			649.80	m ²	649.80	m ²
Teacher Support and Resource Center Building			122.21	m ²	122.21	m ²
Toilet Building			108.24	m ²	108.24	m ²
Multi Purpose Building			577.44	m ²	577.44	m ²
Canteen Building	334.26	m ²	167.81	m ²	502.07	m ²
Male Accommodation Building (1)	406.74	m ²	82.77	m ²	489.51	m ²
Male Accommodation Building (2)	406.74	m ²	82.77	m ²	489.51	m ²
Female Accommodation Building (1)			714.53	m ²	714.53	m ²
Female Accommodation Building (2)			589.93	m ²	589.93	m ²
Teacher Accommodation Building (1)~(7)	639.39	m ²	840.00	m ²	1,479.39	m ²
Guard Building			8.00	m ²	8.00	m ²
Garage (1)	50.19	m ²			50.19	m ²
Garage (2)			42.75	m ²	42.75	m ²
Electrical Building (1)	24.00	m ²			24.00	m ²
Electrical Building (2)			3.36	m ²	3.36	m ²
Pump Building			35.00	m ²	35.00	m ²
Floor Area	4,087.81	m ²	4,176.93	m ²	8,264.74	m ²

2) Section Plan

In Mozambique, which is situated in the southern hemisphere, strong sunlight comes from the north. In order to protect against the strong sunlight, openings of northern walls are minimized at each of the existing facilities. This architectural design policy is also to be employed in this project.

In order to save maintenance and management costs, air conditioning equipment is to be installed only in the food storage where a refrigerator and a freezer are to be installed for storing foodstuffs. All the other rooms, which are not to be air-conditioned, are to have high ceilings to secure sufficient air

volume. They are also to make full use of natural ventilation and lighting for greater comfortableness. All the existing facilities are single-story structures and have an eave height of 3.5 m. The existing facilities are to be renovated without any change in story height. Roofs and roof trusses are to be replaced. The new facilities are also to have a story height similar to that of the existing facilities.

(6) Structural Plan

1) Plan to Renovate the Existing Structures

The plan to renovate the existing structures is as stated below.

Table 2-23 Rehabilitation Plans for Existing Structures

Portion	Rehabilitation plan
Roof truss	Blocks on RC beams and existing wood frames are all to be removed and steel frame trusses are to be newly installed. Components of trusses to be angle (L-60x60x6) which are easily procured locally.
Beam	Concrete blocks on the beams are to be replaced with new ones for installation of the new roof trusses.
Column	Those that look intact are to be used without any repairs.
Floor	Some cracks have been generated but do not show subsidence. Therefore, it is judged that the ground bearing condition is settled. The existing floor will be concreted anew on it with welded wiremesh.
Wall	Since the details of the structure below the floor slabs are unknown, the existing walls are to be left as they are, in principle. Where additional partition walls are needed to be installed, those shall be of light wooden frame.
Foundation / foundation girder	Since the details of the bearing capacity of soil, the size of the foundations and so on are unknown, the weight of the new facilities are not to exceed that of the initial ones in principle.

As in the case of the existing facilities, all columns and beams of the new facilities are to be of reinforced concrete structure, and roofing structure is to be steel trusses. Floor slabs are also to be reinforced concrete.

2) Structure of New Facilities

- Outline of Structure

- No. of stories : 1
- Story height : 6.5m (Multi Purpose Building)
3.5 m (all others)
- Type of structure : reinforced concrete (portions below beams)
Steel truss (roofing structure)
- Footing : continuous footing

Live load : as shown below (calculated in accordance with the Building Standards Act of Japan)

Position	(N/m ²)	
	For Floor slab/Beam	For Structural Frame
Classroom	2,300	2,100
Office	2,900	1,800
Bed Room	1,800	1,300
Roof	600	600

Wind pressure : calculated as follows (in accordance with Building Standards Act of Japan)

$$q = 0.6 E V_o^2$$

q : velocity pressure (N/m²)
 E : regional coefficient
 V_o : wind velocity (M/S)

$$w = q \cdot C_f$$

w : wind pressure (N/m²)
 q : velocity pressure (N/m²)
 C_f : coefficient of wind force

Earthquake load : not considered.

- Main materials used

Concrete : SABS 0144 $F_c = 25 \text{ N/mm}^2$
(compressive strength for 4-week prism specimen)

Reinforcing Bar : SABS920, Grade R250

Steel : SABS1431, equal-angle steel 240W

(7) Electrical Equipment Plan

1) Power Intake Equipment

At present low-voltage electric power is received since the total demand for electric power at the project site is less than 49 kVA. If the total demand for electricity increases as a result of renovation of the existing facilities, construction of new facilities and procurement of additional items of equipment, it will be difficult to meet the increased demand with supply of low-voltage electricity.

For this reason, 3-phase, 3-line 11 kV high-voltage electric power is to be received from a substation of Mozambique Electric Power Corporation, which is located about 250 meters away from the north side of the project site, via an elevated distribution line.

The 250 meter-long elevated distribution line will be included in this project, and the work to install the line is to be carried out by the Mozambique side.

A power intake pedestal is to be installed near the northern end of the project site and it is to be

equipped with a section switch, which is to serve as a point of division of responsibility between Mozambique Electric Power Corporation and the project site. A cable to connect the pedestal and the power substation is to be laid underground.

2) Electrical Equipment

① High-Voltage Power Receiving Equipment

An outdoor power substation cubicle is to be installed near the existing electrical building. The transformer is to be an outdoor transformer, where low-voltage power is to be supplied to each building via a low-voltage power switchboard. The power substation cubicle and the transformer are to be protected against intrusion by means of fences or the like. A power supply meter of Mozambique Electric Power Corporation is to be installed within the new electrical buildings

② Mains Supply System

Electric power is to be distributed to the distribution switchboard and the power control board installed in each building from the low-voltage panel board housed in the power substation. Mains voltage is to be 3-phase, 4-line 400/220V. The overhead electricity mains connected to the existing facilities to be renovated should be removed and new low-voltage electricity mains are to be laid underground.

(The overhead electricity mains connected to those existing facilities which are not included in this project are to continue in use, being connected to the low-voltage distribution switchboard housed in the existing electrical building.)

Estimated electric power demand of each building is as shown in the following table.

An alarm display unit is to be installed in the administration building. It is to detect abnormalities in the water storage tank, the elevated tank, the power substation or the emergency generators.

③ Emergency Generator

Power supply from Mozambique Electric Power Corporation cut off several times a month for troubleshooting and periodic inspection. To ensure uninterrupted power supply to the air conditioner, refrigerator and freezer installed in the food storage in the canteen building, the medicine storage in the clinic, the water storage tank pump, an emergency generator is to be procured and installed to cope with such power stoppages.

A cubicle-type outdoor generator is to be procured and protected against intrusion by means of

block walls.

Table 2-24 Power Demand Calculation Table

Building	Total Connecting Load	Demand Factor	Max. Load	Remarks
Teachers Building	12.90kVA	40%	5.16kVA	
Administration Building	4.09kVA	60%	2.45kVA	
Canteen Building	10.76kVA	30%	3.22kVA	
Multi Purpose Building	13.76kVA	20%	2.75kVA	
Laboratory Building, etc.	22.56kVA	30%	6.76kVA	
Male Accommodation Building (1)	13.40kVA	20%	2.68kVA	
Male Accommodation Building (2)	13.40kVA	20%	2.68kVA	
Teacher Accommodation Building (6A/6B)	16.02kVA	30%	4.80kVA	
Teacher Accommodation Building (5A/5B)	16.02kVA	30%	4.80kVA	
Teacher Accommodation Building (1A/1B)	6.20kVA	30%	1.86kVA	
Teacher Accommodation Building (2A/2B)	6.70kVA	30%	2.01kVA	
Teacher Accommodation Building (3A/3B)	6.70kVA	30%	2.01kVA	
Teacher Accommodation Building (7A/7B)	11.08kVA	30%	3.32kVA	
Classroom Bilding (2)	5.97kVA	60%	3.58kVA	
Classroom Bilding (3)	5.97kVA	60%	3.58kVA	
Female Accommodation Building (1)·(2)	27.97kVA	20%	5.59kVA	
Teacher Accommodation Building (4)	5.39kVA	30%	1.61kVA	
Classroom Bilding (1)	7.07kVA	60%	4.24kVA	
Guard Building	0.16kVA	60%	0.09kVA	
Electrical Building	13.28kVA	50%	6.64kVA	
Other Existing Buildings	40.00kVA	50%	20.00kVA	10VA/m ²
Total	259.40kVA		89.83kVA	

3) Lighting Equipment and Wall Outlets

A distribution panelboard is to be installed in each building to ensure appropriate power circuit structure. From these distribution panelboards electric power is to be distributed to lighting equipment and wall outlets.

① Lighting Equipment

Appropriate lighting fixtures, mainly fluorescent lamps, should be selected and necessary on/off switches should be installed to save electricity.

Shown below is the design illuminance for lighting fixtures to be installed in main rooms.

Table 2-25 Design Illuminance for Lighting Fixtures to Be Installed in Main Rooms

Room Name	Lighting Fixture	Designed Illuminance
Administration Office, Head Master Office, Pedagogical Head Office	FL40W×2	200 LX
Classroom	FL40W×2	200 LX
Multi Purpose Hall	FL40W×2	200 LX
Canteen	FL40W×2	200 LX
Accommodations	FL40W×1 FL20W×1	100 LX
Toilet · Equipment	FL40W×1 FL20W×1	50 LX

② Wall Outlets

About two wall outlets are to be installed in each room. Wall outlets are not to be installed in excessive numbers. In installing power supply to electrical equipment, due consideration should be given to the consistency of power circuit structure and location of wall outlets with power capacity.

A power supply transfer panel for use in special events is to be installed in Multi Purpose Building.

4) Telephone Equipment

Telephones are to be installed in Administration Building.

A telephone switchboard, which is to be connected to terminal boards and telephone outlets in other buildings, is to be installed in Administration Building.

The location of telephone outlets should be decided giving due consideration to purposes of use of telephones, such as extension/outside line telephone call, transmission of facsimile messages and access to the Internet.

5) Lightning Arrester

A lightning arrester to protect the elevated tank against lightning is to be installed.

(8) Water Supply Equipment Plan

- City water is to be received from a public elevated water tank located near to the north side of the project site via a water main installed on the east side of the project site. It is to be stored in the water storage tank ($V=60 \text{ m}^3$), from which it is to be pumped up into an elevated water tank to be newly built (height: 18 m; $V=10 \text{ m}^3$). Then it is to be supplied to each building.

Since the existing plumbing has badly deteriorated, water pipes and water mains are to be newly

installed. The existing plumbing is to be discarded. The existing water meter is to be relocated in Pump Building which is to be newly installed along with a water storage tank.

In order to secure water supply to those buildings which are not covered by this project, a new water main is to be connected to the existing water main. Hot water for showers is to be supplied to Teacher Accommodation Buildings only. In order to save maintenance expenditures, a solar water heating system is to be provided.

- Calculation of the necessary quantity of water supplied and that of water stored

Monthly water consumption is presently 1,000 m³ and the CFPP has an enrolment of 450 students. Therefore, water consumption per day/person is 74 liters. Sanitary fixtures installed in the existing facilities are to be replaced since they are too superannuated for sufficient water supply. This arrangement will result in an increase in the quantity of water supplied.

As stated above, If it is assumed that water consumption per day/person will increase by 35 percent after completion of this project, the planned water consumption per day/person is 100 liters.

- Calculation of quantity of water supplied

Students	400	100 liters per day/person	=	40,000 liters/day
Teachers	60	100 liters per day/person	=	6,000 liters/day
Teacher Accommodation Bldgs.	120	100 liters per day/person	=	12,000 liters/day
				<hr/>
				58,000 liters/day
				→ 60,000 liters/day

- Capacity of water storage tank

Capacity to meet daily water consumption 60m³

- Capacity of elevated water tank

To meet water consumption during two hours out of twelve hours (2/12) as a daily consumption unit 10m³

(9) Drainage System

- Domestic wastewater is to be made to directly permeate the soil through permeation tanks and pipes after it is treated in standard septic tanks that meet the IMAP standards. The location of septic tanks and permeation tanks should be decided giving due consideration to the possible effects of bad odors and other sanitary conditions. Rainwater is also to be made to permeate the soil in order to minimize load on the drainage system.

Drainpipes are also to be replaced as they have badly deteriorated. Furthermore, the existing septic

tanks and permeation tanks, which are not functioning satisfactorily, should also be replaced.

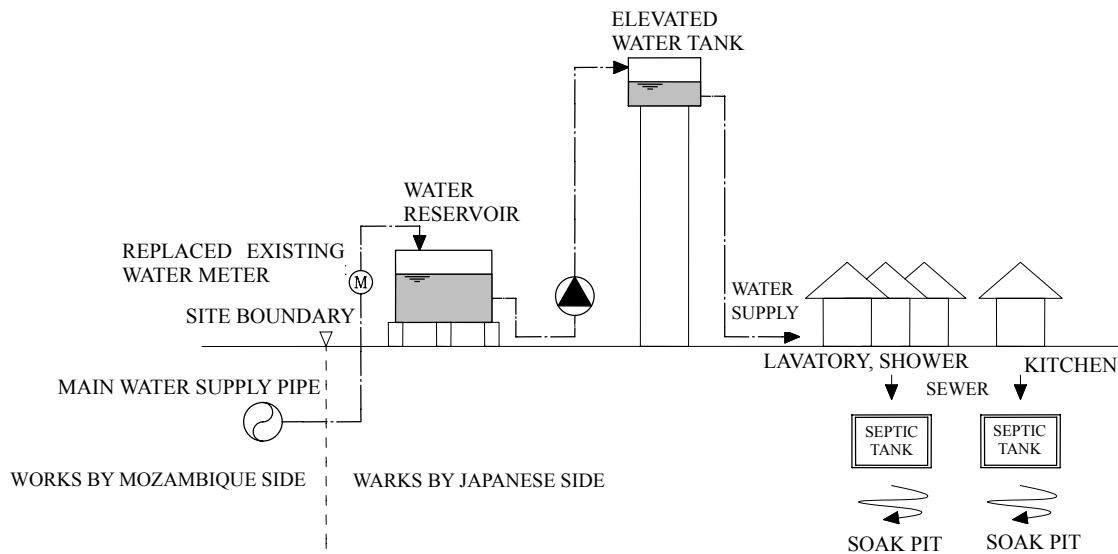


Figure 2-3 Plumbing System Schematics

(10) Air Conditioning Equipment Plan

A wall-mounted, package-type air conditioner will be installed in the food storage in Canteen Building.

(11) Refrigerating Equipment Plan

A food refrigerator and a foodstuff freezer will be installed in the food storage in Canteen Building. And a medicine refrigerator will be installed in the clinic in Teachers Building.

(12) Construction Material Plan

List of Structural Materials

Portion	Material	Remarks
Beam / Concrete slab / Foundation girder / Foundation	Reinforced concrete	Mixed at site. Ready-mixed concrete is not available.
Roof truss	Steel angle truss	Steel frame is expensive and only small section items can be available in the country. Though large section items are produced in South Africa, they are seldom imported to Mozambique. Common local practice is that even long span roof truss is made of steel angles by means welding.
Exterior wall	Concrete block	The most popular method in Mozambique. The concrete blocks manufactured locally are used.

List of Exterior Finishing Materials

Portion	Material	Remarks
Roof	Pre-painted metal panel	Pre-painted metal panel to be used for office, classrooms, accommodation etc. imported from South Africa
Exterior wall	Paint finish on mortar steel troweled concrete block	Common in the country. Existing buildings are also with this finishing.
Doors and windows	Wood	Wooden frames are locally produced. Various types of imported glass are available in the market.
	Steel	Steel doors and windows are durable and obtained from South Africa.

List of Interior Finishing Material

Building Name	Room	Floor	Wall	Ceiling
Administration Building	All rooms (Toilet)	Ceramic Tile (Mortar Steel Troweled)	Paint on Mortar Steel Troweled (Ceramic Tile)	Mineral Acoustical Board (Gypsum Board)
Teachers Building				
Classroom Buildings				
Laboratory Building				
Teachers Support and Resource Center building				
Male Accommodation Buildings	All rooms (Toilet)	Mortar Steel Troweled	Paint on Mortar Steel Troweled (Ceramic Tile)	Mineral Acoustical Board (Gypsum Board)
Female Accommodation Buildings				
Teacher Accommodation Buildings	All rooms (Toilet)	Ceramic Tile	Paint on Mortar Steel Troweled (Ceramic Tile)	Mineral Acoustical Board (Gypsum Board)
Toilet Building	—	Mortar Steel Troweled	Ceramic Tile	Gypsum Board
Canteen Building	All rooms (Toilet)	Ceramic Tile (Mortar Steel Troweled)	Paint on Mortar Steel Troweled (Ceramic Tile)	Gypsum Board
Guard Building	—	Mortar Steel Troweled	Paint on Mortar Steel Troweled	—
Pump Building	—			
Electrical Building	—			

2-2-2-2 Equipment Plan

(1) Method of Selection of Items of Equipment

All items of equipment for use in the IMAPs are procured in accordance with the relevant IMAP standards. Items of equipment to be procured under this project will be selected in accordance with the following criteria for selecting and excluding items of equipment, which were developed using the list of standard items of equipment as a reference guide.

Criteria of Selection of Items of Equipment

- 1) Basic items of teaching and training equipment.
- 2) Items of equipment which are necessary for maintaining the key function of an educational institution.
- 3) Items of equipment which are consistent with the IMAP curriculum.

Criteria of Exclusion of Items of Equipment

- 1) Referred to in lectures but not included in practice program.
- 2) For general purpose use, but not for specific use. (It is likely that these items of equipment will not be used effectively.)
- 3) Can be used with items of equipment of other department.

Consumables included in the list of items of equipment are to be excluded from this project, except for replacement parts of audiovisual equipment.

Item of equipment	Name of replacement part	No. of units	Rationale
Overhead projector	Lamp as source of light	1	For emergency use, one spare lamp is to be included.
Slide projector	Lamp as source of light	1	ditto

(2) Method of Determining the Necessary Number of Selected Items of Equipment

The necessary number of items of equipment was determined by examining the purpose of use of each item of equipment and classifying the selected items of equipment as follows.

- 1) Furniture for use in education (student's desk, student's chair): Quantity large enough for all students.
- 2) Educational equipment (photocopier, overhead projector, etc.): Minimum necessary quantity.
- 3) Practice training equipment: Number of students per unit is first determined and then it is reflected in

the planned quantity.

3 students per unit Equipment for use in observation of nature (microscope and peripheral instruments)

6 students per unit Equipment for use in music education (guitar, tambourine, etc.)

4) The number of units of equipment for use in natural science experiments, which the teacher uses to illustrate the contents of textbooks, is one per for one subject; equipment for use in weather observation, equipment for use in experiments in electricity and magnetism, and equipment for use in experiments in motion and force.

(3) Status of the existing items of equipment and the outline of items of equipment selected for the project

Given below is the outline of the items of equipment selected for this project on the basis of the present status of the existing items of equipment.

Classroom
Items of equipment that meet IMAP standards: Student's desk/chair, teacher's desk/chair, drawing instrument set, storage cabinet
Existing items of equipment: There is a total of 10 classrooms, each provided only with a teacher's desk and chair, a blackboard, and student's desks (each with two chairs). Almost all pieces of furniture have been superannuated and therefore should be replaced. The blackboards are 3 meters wide, relatively small compared with the size of the classroom. It is difficult for students seated near the wall to read words and figures written on them. There are two types of student's desks, each of which is for the use of two students. Some of them are 1200 mm wide, and all others 1000 mm wide. Desks of the latter type are basically for the use of primary school pupils.
Procurement plan: A pair of student's desk and student's chair are to be procured for each student. In classes in English, it is difficult to rearrange the existing student's desks. (For example, when these desks are rearranged for group discussions, these desks are rearranged in two rows with a large space between the two rows.) The blackboards should be 6 meters wide so that students seated near the wall and the windows may easily read words and figures written on them. The drawing instrument sets, which are currently used in classes in mathematics, should also be used in classes in other subjects since their use in classes in other subjects is limited. In order to secure a notice place, a limited number of flannel boards should be included in this project.
Library
Items of equipment that meet IMAP standards: Bookshelf/storage rack/card cabinet/library counter/reading table/newspaper rack
Existing items of equipment: Since the existing library is basically designed for use in the CFPP and therefore is capable of housing a limited number of books. It is actually functioning as a place for storing textbooks and also as a study room. Books housed in the library are not lent out. The shelves installed in the library are 10 shelves, each with 4 decks, 3 cabinets and two glass-fronted cabinets. They are used to store books, magazines and newspapers. Equipped with only two reading tables, the library can accommodate a total of 10 students at a time. All pieces of furniture installed in the library have been superannuated and therefore must be replaced.
Procurement plan: The bookshelves are to be replaced. The total number of shelf boards is to be calculated based on the total number of reference books for use in each curriculum. As no books are lent out, the planned library should have a space for a total of 24 students (2 students in one class). No newspapers available in the new library, therefore newspaper rack is not included in this project. Card cabinet is also to be excluded from this project since book management is not conducted by the use of a card index system. Some of the existing bookshelves are to be used as shelves for storing teaching materials.

Administration department
Items of equipment that meet IMAP standards: Work desk/work chair/bench seat/filing cabinet/electric typewriter/manual typewriter/personal computer system/desk-top calculator/photocopier/mimeograph machine/cutter/binder drill/punch/ binding machine (combo type)/stapler/storage cabinet/storage rack/counter
Existing items of equipment: The administration department is provided with filing cabinets, storage cabinets, work desks, personal computers (6 units, manual typewriters and a rotary press. Four personal computers were given to the department from a college. But all of them were found to be defective and unrepairable. The remaining two ones are used for clerical work, but one of them are no longer usable. After all, only one unit installed in the head master's office remains usable. The head master produced printed matter using the personal computer and print additional copies using the rotary press. Printed matter consists mainly of test papers. (Tests are conducted at the end of each term. Final tests are conducted using test papers prepared by the Ministry of Education.) The rotary press have been so superannuated that it should be replaced.
Procurement plan: Furniture and fittings for use in the administration department is included in this project. 2 manual typewriter are to be included in this project. Two personal computer systems are to be procured under this project, one for the use of staff members of the accounting and administration departments and the other for the use of other staff members. Printed matter is to be lithographed using a rotary press. Materials to be posted up and school schedules are to be prepared using a photocopier.
Teachers' room
Items of equipment that meet IMAP standards: Work desk/work chair/filing cabinet/storage cabinet
Existing items of equipment: One of the existing classrooms is used as a substitute for a teacher's room. Two of the tables and eight of the chairs have been superannuated and should be replaced.
Procurement plan: Furniture and fittings for use in the teacher's rooms is to be included in this project. Equipment for use in production of teaching materials are to be for common use for efficiency. All items of equipment, except for photocopier, are to be installed in Teacher Support and Resource Center.
Small meeting room
Items of equipment that meet IMAP standards: Conference table/conference chair
Existing items of equipment: As the CFPP has no meeting rooms, there are no conference tables or conference chairs.
Procurement plan: The planned small meeting room is to accommodate up to 18 persons and is to be equipped with furniture and fittings.
Clinic
Items of equipment that meet IMAP standards: Boiling sterilizer / sphygmomanometer / reflecting mirror / equipment for use in medical treatment / consulting table / mattress / bed / mattress / physician's desk/physician's chair / wagon / refrigerator / storage cabinet / partition / stool
Existing items of equipment: The CFPP do not have a clinic.
Procurement plan: The planned clinic, which is to be placed in charge of a nurse, is to be provided with basic items of consulting/first aid equipment
Kitchen/canteen
Items of equipment that meet IMAP standards: Electric mincer/manual paring machine/slicer/scales/tableware/wagon/dining table/dining chair/employees' table/single-wing desk/chair/storage cabinet/storage rack/work table
Existing items of equipment: The CFPP is provided with a total of 18 tables and a total of 20 bench seats (1250 mm wide and 240 mm deep; for three persons). But most of the students take meals outdoors or near their dormitories. Both the tables and the bench seats have been badly superannuated, some of them being damaged. Near the window of the kitchen is a washing table and in the center of the kitchen is a range. But neither of them is in use. Cooking is done at an open space surrounded by concrete fences. The cooing equipment installed in the refrigerating room has been superannuated and damaged and is therefore unusable. The existing kitchen is used as a space for distributing meals cooked outdoors to students. (Students bring tableware with them.)

<p>Procurement plan: The planned canteen is to service students in rotation--servicing a total of 200 students at a time. Furniture and fittings to be installed in the canteen and the kitchen are to be included in this project. Some kitchen utensils (electric mincer, manual paring machine are to be excluded from this project since they are not included in the cooking method employed at the CFPP.</p>
<p>Dormitory</p>
<p>Items of equipment that meet IMAP standards: Bed/mattress/locker/cabinet</p>
<p>Existing items of equipment: The CFPP has two dormitories for male students, each of which has two wings with a shower room in between. Each wing has four rooms. Each room is equipped with single-deck beds and double-deck beds. Most of the beds have been badly superannuated and therefore should be replaced. Each room is designed to accommodate up to 10 students. But in actuality each of them is occupied by seven to nine students. The total number of single-deck beds is 61, that of double-deck beds being 20. The CFPP also has two dormitories for female students. One of them has a total of nine rooms and is occupied by female students, but the other is used as a foodstuff storehouse, an office, a stall, etc. These dormitories are provided with a total of double-deck beds and a total of 55 single-deck beds. Ten of them are used with a mattress only. Most of them have been superannuated and therefore should be replaced.</p>
<p>Procurement plan: For rationalization purposes, only double-deck beds are to be procured under this project. Each room, which is to accommodate a total of 12 students, is to be equipped with a storage rack and a work table to be used as a studying or reading table.</p>
<p>Multi purpose hall</p>
<p>Items of equipment that meet IMAP standards: Stackable chair/stage/storage cabinet/storage rack</p>
<p>Existing items of equipment: No existing items of equipment.</p>
<p>Procurement plan: The planned multi purpose hall is to accommodate up to 300 persons (200 students and 100 teachers/guests). A total of 100 chairs are to be procured under this projects. Students are to bring with them chairs they use in the classroom. A basic audio system (portable PA set) is to be procured under this project.</p>
<p>Vehicle</p>
<p>Items of equipment that meet IMAP standards: Vehicle</p>
<p>Existing items of equipment: There is a space for housing a couple of vehicles. This space is currently used for a pickup truck and a 10-seater vehicle. The pickup truck is used for transporting foodstuffs and other materials and also for transporting teachers when the 10-seater vehicle cannot be used. The 10-seater vehicle has been so superannuated that it often beaks down.</p>
<p>Procurement plan: A microbus which is necessary for practice teaching is to be procured under this project, and no pickup truck is to be included in this project. Practice teaching is to be conducted in a total of five schools located in and around Xai-Xai City. These schools are located 1 to 15 kilometers (7 kilometers on average) away from the project site. It is therefore necessary to procure a microbus to transport students/teachers to and from these schools.</p>
<p>Educational equipment</p>
<p>Items of equipment that meet IMAP standards: Cassette tape recorder/portable PA set/camera set/overhead projector/slide projector/screen/monitor TV set</p>
<p>Existing items of equipment: No existing items of equipment.</p>
<p>Procurement plan: Minimum necessary items of equipment are to be procured, sharing with Teacher Support and Resource Center.</p>
<p>Mathematics/information</p>
<p>Items of equipment that meet IMAP standards: Drawing instrument set (compass, divider, triangle, etc.)/graph board/mathematical demonstration/geometrical forms (cone/sphere/cube, etc.)/measuring instrument set/desk-top calculator</p>
<p>Existing item of equipment: No existing items of equipment.</p>

<p>Procurement plan: All the items of equipment that meet IMAP standards are to be procured under this project (one set each), except for desk-top calculator and measuring instrument set, so that teachers may use them for demonstration purposes. Desk-top calculator is excluded from this project because it is not consistent with the curriculum. Measuring instrument set is also excluded because measuring instrument sets for use in classes in natural science can be used for use in classes in mathematics/information.</p>
Natural science
<p>Items of equipment that meet IMAP standards: Laboratory table/stool/teacher's desk/teacher's chair/fume hood/blackboard/refrigerator/measuring instrument set/drying shelf/constant temperature tank/hot plate/mantle heater/magnifying glasses/microscope (40 to 600 x magnification)/maximum/minimum thermometer/binoculars (20 to 60 x magnification)/glass ware/work table/stool/storage cabinet/storage rack/optical table (1,200 mm, light source, screen)/lens prism (convex lens, prism, cylindrical lens, etc.)/mirrors (plane mirrors, large and small)/pH meter (reagent, color code card, etc.)/world atlas/device for explaining revolution of the earth/direction meter/molecule model/globe/dissection set/plant collecting set/DNA model/slide prepared for microscope/fossil specimens/anatomical human body</p>
<p>Existing items of equipment: No existing items of equipment.</p>
<p>Procurement plan: In accordance with the curriculum, natural science is selected as subject of practical training. Under this project, in addition to the basic items of equipment, equipment for use in weather observation, experiments in electricity and magnetism, experiments in motion and geological experiments are to be procured so that teachers may use them for demonstration purposes.</p>
Art education
<p>Items of equipment that meet IMAP standards: Teacher's desk/teacher's chair/blackboard/drawing board/drawing instrument sets (compass, divider, triangle, etc.)/manual paper cutter/easel/plate set/movable blackboard/flannel board/canvas stretcher/knife/work table/stool/storage cabinet/storage rack</p>
<p>Existing items of equipment: No existing items of equipment.</p>
<p>Procurement plan: Those items of equipment which students use in practical training in production of teaching materials and those which are indispensable for learning the basics of art are to be procured under this project.</p>
Craft education
<p>Items of equipment that meet IMAP standards: Electric drill/electric circular saw/engraving instrument/desk-top shears/grinder/hand tools for metal work/hand tools for wood work/hand tools for electrical work/measuring instrument/sewing machine/sewing kit/iron /ironing board/mirror/mannequin/work table/stool/storage cabinet/clay table/potter's wheel/spatula/work table/ stool/storage cabinet/weaving machine/scissors/gardening implements.</p>
<p>Existing items of equipment: No existing items of equipment.</p>
<p>Procurement plan: Hand tools for metal work, wood work and electrical work which are to be procured under this project should be basic ones. Electric hand tools are excluded from this project. Dressmaking instruments and pottery instrument are to be included in this project.</p>
Music Education
<p>Items of equipment that meet IMAP standards: Cassette tape recorder/score blackboard/electric piano/classic guitar/recorder(alt & tenor)/marimba/tambourine/drum set/conga/score stand/metronome</p>
<p>Existing items of equipment: No existing items of equipment.</p>
<p>Procurement plan: Basic practical training equipment is to be procured under this project. Percussion instruments, stringed instruments, wind instruments are to be included in this project.</p>
Physical education
<p>Items of equipment that meet IMAP standards: Champling/football goal posts/basketball goals/volleyball posts/handball posts/table-tennis set/badminton set/high jump set/baton/hurdle/line drawing device/tape measure/rope/air pump</p>
<p>Existing items of equipment: Existing football goal posts have been so superannuated that they should be replaced.</p>
<p>Procurement plan: Basic items of equipment are to be procured under this project. Football set, handball set, basketball set, track-event set, mat and jump box are to be included in this project.</p>

Teacher Support and Resource Center
Standard items of equipment for Teacher Support and Resource Center: Cabinet/work desk/work chair/desk for use in seminar/chair for use in seminar/personal computer system/computer table/lithograph/TV set/video camera/digital camera/CD cassette/overhead projector
Existing items of equipment: No existing items of equipment
Procurement plan: The audiovisual system for use in seminars held at this center is to be shared with the IMAP. Office equipment, furniture and fittings for use in seminars and equipment for use in production of teaching materials (including binding machine) are to be procured under this project. Two personal computer systems are to be procured under this project, one for use in production of teaching materials and the other for use at Teacher Support and Resource Center. At present, the IMAP curriculum is in the process of being revised, consequently some of the contents of textbooks now in use are not consistent with the curriculum. Teachers often have to produce supplementary teaching materials since the details of practical training are left to teachers' discretion. For these reasons, a personal computer system for the use of teachers is included in this project. Teacher Support and Resource Center will need a personal computer system for managing information on teachers to be retrained, keeping records on them, preparing relevant documents and exchanging information with other teacher support and resource centers for the purpose of working more closely with the IAP and local communities. For this reason, one for the center is included in this project.

The name, specifications, quantity and purpose of use of each of the main items of equipment are as shown in the following table.

Table 2-26 List of Main Items of Equipment

Name of equipment	Specifications	Q'ty	Purpose of use
Administration/Teacher's room			
Personal computer system	Main body: Pentium Celeron 1.8 GHz, user memory: 51.2 MB, hard disk: 40 GB, monitor: 17 inches Laser printer: printing speed: 12 sheets/m, resolution: 600 dpi, software: MS Windows, MS Office	2	To be used for financial management and management of data on students and teachers.
Photocopier	Black-and-white copy size: A4, printing speed: 18 sheets/m	1	To be used for copying office data and educational reference material.
Slide projector	Slide size: 25 x 35 mm, light source: halogen lamp, zoom: 100 to 150 mm, focusing: automatic/manual	1	To screen slides during lecture.
Overhead projector:	OHP film size: 25 x 285 mm, projector lens: 265 to 95 mm, light source: halogen lamp	2	To screen OHP film during lecture.
TV set/video cassette deck	TV set: color TV set screen size: 29 inches, format: VHS	1	To screen educational video films
Clinic			
Boiling sterilizer	Inside dimensions: 450 x 300 x 200 mm, material: stainless steel, heater: pipe heater	1	To sterilize stainless steel small instruments
Consulting/first aid equipment	Items: stethoscope, sphygmomanometer, head mirror, bandage, forceps, scissors, intravenous injection stand	1	Diagnosis and first aid
Refrigerator	Two-door type, capacity: refrigerating: 150 L; freezing: 50 L	1	To refrigerate medicines.
Multipurpose hall			
Portable PA set	Items: wireless amplifier, tuner, microphone, wireless microphone	1	To cause messages and sounds to become louder.
Vehicle			
Minibus	30-seater diesel, 5-position transmission, tire: front wheel x 2, rear wheel x 4, length: 7,000 mm; width: 2,000 mm; height: 3,000 mm	1	To transport students/teachers
Educational equipment (mathematics)			
Drawing instrument set	Items: compass, protractor, triangle (2 types), square	1	To draw figures, diagrams, etc. on blackboard.
Graph board	Hangar hook-type or stand-type, size: 1,000 x 1,000 mm	1	To quadric curves and the like.

Name of equipment	Specifications	Q'ty	Purpose of use
Mathematical demonstration	Items: column, conic triangle pole, triangular pyramid, plastic board to demonstrate Pythagoras' theorem, etc.	1	To illustrate relation between cubic form and cubic content, Pythagoras' theorem, etc.
Geometrical forms	Items: quadratic pyramid, quadratic prism, cone, cylinder, triangular pyramid, triangle pole, sphere	1	To study basic properties of cubes.
Natural science			
Optical experiment set	Items: optical experiment table, concave lens, convex lens, prism, convex mirror	1	To study earth and celestial objects.
Geo-science experiment set	Items: celestial globe, compass, mineral specimen, fossil specimen, etc.	1	To study earth and celestial objects.
Electric/magnetic experiment set	Items: series/parallel circuit model, magnets	1	To study basic properties of electricity and magnetism.
Kinematic experiment set	Items: experimental equipment to study principle of leverage, principle of axle, principle of collision of metallic spheres which are equal in mass	1	To study principles of force and leverage.
Weather observation set	Items: anemometer, rain gauge, maximum/minimum thermometer, hygroscope, barometer	1	To study weather phenomena.
Microscope	Type: unioocular, 40 to 600X magnification, eye lens: 10X, 15X, object lens: 4X, 10X, 40X	13	To observe details of animals and plants.
Plan Collecting set	Items: specimen board, shovel, pruning shears	13	To observe collected plants
Anatomical human model	Size: full-size, material: plastic, number of parts of disassembly : 10	1	To explain human internal organs.
Human skeleton model	Male model, size: full-size, material: plastic	1	To explain human skeleton.
Technology education			
Hand tools for metal work	Items: anvil, metal saw, hacksaw, cold chisel, hand drill, hand hammer, minus driver, screw driver, power screw driver, nippers, cutting nippers, metal cutting scissors, electric soldering iron, file	1	Basic items of metalworking equipment
Hand tools for wood work	Double-edged saw, hand plane, chisel, drill, hammer, metal measure	1	Basic hand tool for use in metal work
Hand tools for electrical work	Screw driver, soldering iron, nippers, pliers, file	1	Basic hand tools for wood work
Sewing machine	Domestic sewing machine (electrically-powered, desk top)	3	Equipment for use in practical training in dressmaking
Iron/ironing board	Domestic, heater: 1000 W	3	Equipment for use in practical training in dressmaking
Ceramic art set	Items: manual potter's wheel, clay board, spatula	1	Equipment for use in practical training in ceramic art
Gardening implements	Items: shovel, hoe, fork, trowel, soil sieve, spatula	3	Equipment for use in practical training in gardening
Visual education			
Drawing board	Material: plywood, size: A1 (desk top)	3	To create original pictures for use in paperwork.
Drawing instrument set	Items: compass, protractor, triangle, square	3	To create original pictures for use in paperwork.
Paper processing set	Roller cutter, cutter, square for use with cutter	1	Tools for use in paperwork.
Oil painting set	Palatte, paint brush, petty knife, easel	1	To produce teachingmaterial for training
Watercolor painting set	Palette, paint brush	16	To produce teachingmaterial for training
Music education			
Cassette tape recorder	Double cassette tape deck, equipped with CD player	1	For recording musical performances and for listening to music.
Electric piano	Tone quality: piano, organ, harpsichord, vibraphone, number of keys: 61, effect: chorus, recorder, recording/replay, equipped with tempo control, output: 5W x 2 speaker, provided with MIDI output function	1	Equipment for use in practical training in music.

Name of equipment	Specifications	Q'ty	Purpose of use
Classic guitar	Classic guitar with 6 strings	5	Equipment for use in practical training in music.
Marimba	Type: soprano/alto, keys: 42, octave: 3	1	Equipment for use in practical training in music.
Drum set	Items: bass drum, snare drum, tom holder, tom-tom, light cymbals, clash cymbals, hide cymbals	1	Equipment for use in practical training in music.
Physical education			
Football goal posts	Material: post/crossbar: steel pipe, net: vinylon	1	Equipment for use in physical training.
Basketball goals	For outdoor use, material: frame: steel, board: wood	1	Equipment for use in physical training.
Handball goal posts	Material: post/crossbar: steel pipe, net: vinylon	1	Equipment for use in physical training.
Track-event set	Items: baton, line drawing machine, tape measure, stopwatch	1	Equipment for use in physical training.
Jump box	8 layers, size: 1200 mm (depth), 1350 mm (height), 450 mm (width)	2	Equipment for use in physical training.
Mat set	Material: canvas, size: 1200 mm x300 mm x 50 mm	2	Equipment for use in physical training.
Teacher Support and Resource Center			
Personal computer system	Main body: Pentium Celeron 1,8 GHz, user memory: 512 MB, hard disk: 40 GB, monitor: 17 inches Laser printer: printing speed: 12 sheets/m, resolution: 600 dpi, software: MS Windows, MS Office	2	One for production of teaching materials and supplementary teaching materials (by IMAP teachers) and the other for use in Teacher Support and Resource Center.
Photocopier	Black-and-white copy size: A5 to A4, copying speed: 18 sheets/m	1	Use of photocopier is to be shared between IMAP and Teacher Support and Resource Center.
Stencil duplicator	Copying by means of digital scanner, 4 reduction ratios, paper size: A4, copying speed: 130 sheets/m	0	For use in production of test papers and printing of high-volume data

The quantity of the educational equipment for this project shown below.

Table 2-27 List of Equipment

No.	Equipment	Q'ty
A~J	<General use equipment>	
A	Administration	
A-1	Work desk A	3
A-2	Work chair A	3
A-3	Work desk B	5
A-4	Work chair B	5
A-5	Filing cabinet	7
A-6	Storage cabinet	5
A-7	Counter	2
A-8	Personal computer system	2
A-9	Manual typewriter	2
B	Teachers' room	
B-1	Work desk B	30
B-2	Work chair B	30

No.	Equipment	Q'ty
B-3	Filing cabinet	8
B-4	Storage cabinet	8
B-5	Flannel board	4
B-6	Storage rack	1
B-7	Work table A	5
B-8	Photocopier	1
B-9	Cassette tape recorder	2
B-10	35mm camera set	1
B-11	Slide Projector	1
B-12	Overhead Projector	2
B-13	Screen	3
B-14	TV Set and Video cassette Deck	1
C	Small meeting room	
C-1	Conference table	6
C-2	Conference chair	18
C-3	Movable Blackboard	1
D	Library	
D-1	Bookshelf	10
D-2	Library counter	1
D-3	Reading table	6
D-4	Library chair	24
E	Clinic	
E-1	Work desk B	1
E-2	Work chair B	1
E-3	Storage cabinet	3
E-4	Work table A	1
E-5	Boiling sterilizer	1
E-6	Consulting/first aid equipment	1
E-7	Consulting bed	1
E-8	Bed	2
E-9	Wagon	1
E-10	Refrigerator	1
E-11	Partition	2
E-12	Stool	4
F	Classroom	
F-1	Student's desk	400
F-2	Student's chair	400
F-3	Teacher's desk	12
F-4	Teacher's chair	12
F-5	Blackboard	12
F-6	Flannel board	12
G	Multi purpose Hall	
G-1	Stackable Chair	100
G-2	Stage	1
G-3	Portable PA set	1
H	Kitchen/Canteen	
H-1	Canteen table A	20

No.	Equipment	Q'ty
H-2	Canteen table B	20
H-3	Canteen seat	200
H-4	Storage cabinet	1
H-5	Storage rack	6
H-6	Work table A	1
H-7	Wagon	1
I	Dormitory	
I-1	Bed / mattress	200/400
I-2	Locker	68
I-3	Table	33
I-4	Bench seat	66
J	Vehicle	
J-1	Mini-bus	1
K~Q	<Educational equipment>	
K	Mathematics	
K-1	Drawing instrument set	1
K-2	Graph board	1
K-3	Mathematical demonstration equipment	1
K-4	Geometrical forms	1
L	Natural science	
L-1	Laboratory table	6
L-2	Stool	36
L-3	Teacher's Laboratory table	1
L-4	Teacher's chair	1
L-5	Blackboard	1
L-6	Flannel board	2
L-7	Storage cabinet	4
L-8	Storage rack	4
L-9	Work table A	1
L-10	Measuring instruments set	1
L-11	Glassware and supplies	1
L-12	Optical experiment Set	1
L-13	Geo-Science experiment set	1
L-14	Electric/Magnetic experiment set	1
L-15	Kinematic experiment set	1
L-16	Weather observation set	1
L-17	Molecule Model	1
L-18	Magnifying glasses	13
L-19	Microscope	13
L-20	Dissecting set	13
L-21	Plant collecting set	13
L-22	Slide prepared for microscope	1
L-23	DNA model	1
L-24	Anatomical human body	1
L-25	Human skeleton model	1
M	Craft education	
M-1	Stool	28

No.	Equipment	Q'ty
M-2	Storage cabinet	1
M-3	Storage rack	6
M-4	Movable blackboard	2
M-5	Flannel board	1
M-6	Hand tools for metal work	1
M-7	Hand tools for wood work	1
M-8	Hand tools for electrical work	1
M-9	Measuring instruments	1
M-10	Sewing machine	3
M-11	Dressmaking instruments	3
M-12	Iron/ironing board	3
M-13	Mirror	1
M-14	Ceramic art set	1
M-15	Gardening implements	3
M-16	Work table A	14
N	Art education	
N-1	Teacher's desk	1
N-2	Teacher's chair	1
N-3	Blackboard	1
N-4	Flannel board	3
N-5	Storage rack	8
N-6	Work table B	16
N-7	Work table C	2
N-8	Stool	34
N-9	Drawing board A	3
N-10	Drawing instrument set	3
N-11	Paper Craft set	16
N-12	Oil Painting set	1
N-13	Water painting set	16
O	Music education	
O-1	Student's desk	34
O-2	Student's chair	34
O-3	Teacher's desk	1
O-4	Teacher's chair	1
O-5	Blackboard	1
O-6	Score blackboard	2
O-7	Flannel board	1
O-8	Storage cabinet	2
O-9	Storage rack	1
O-10	Cassette tape recorder	1
O-11	Electric piano	1
O-12	Classical Guitar	5
O-13	Recorder	1
O-14	Marimba	1
O-15	Tambourine	5
O-16	Drum set	1
O-17	Conga	1

No.	Equipment	Q'ty
O-18	Score stand	5
O-19	Metronome	5
P	Physical education	
P-1	Champling	2
P-2	Football goal posts	1
P-3	Basketball goals	1
P-4	Handball goat posts	1
P-5	Track-events set	1
P-6	Air pump	1
P-7	Jump Box	2
P-8	Mat set	2
P-9	Storage cabinet	1
P-10	Storage rack	1
P-11	Ball cage	2
Q	Teacher Support and Resource Center	
Q-1	Work desk B	1
Q-2	Work chair B	1
Q-3	Filing cabinet	1
Q-4	Storage cabinet	1
Q-5	Storage rack	4
Q-6	Work table A	3
Q-7	Personal computer system	2
Q-8	Photocopier	2
Q-9	Binding machine (Combo type)	1
Q-10	Flannel board	1
Q-11	Movable blackboard	1
Q-12	Teacher's desk	1
Q-13	Teacher's chair	1
Q-14	Lecture chair	12
Q-15	Stensil duplicator	1