CHAPTER 1
BACKGROUND OF THE PROJECT

CHAPTER 1 BACKGROUND OF THE PROJECT

1-1 Background of the Request

In spite of all the efforts by the Government of Cambodia (GOC), the situation of health and medical conditions still has not been sufficiently improved. The government is presently suffering from a lack of resources, such as capital and manpower, which affects the progress they are able to make.

Most diseases in Cambodia are categorized as either infectious diseases or communicable diseases, similar to the charactaristics in other countries in tropical areas.

Tuberculosis (TB) is one of the major infectious diseases. Approximately 10,000 people die of TB each year. The number of TB patients has been increasing by 5% annually. The number of notified cases reached about 17,000 in 1998, which indicates that the prevalence of TB is nationwide. Most of the patients are in the age range of twenty to fifty. From an economic point of view, this is the age when people are most productive. The damage which TB inflicts on the Cambodian economy is therefore enormous. In addition to this, an explosion of TB has occurred in HIV endemic areas. Real fears exist that this will have a serious impact on the overall health situation in Cambodia.

With the cooperation of WHO, a new TB control program, called the National Tuberculosis Program (NTP), was started in Cambodia in 1993. As a consequence of this program, the cure rate has been improved markedly (85% in 1995, and 89% in 1996). The implementation of the Plan, however, is confronted with the serious problem of a shortage of trained personnel to implement the TB control program and medical services. The reason for this is mainly due to the fact that TB control activities have expanded so rapidly without full consideration of quality and quantity of personnel engaged in TB control.

The National TB Center (CENAT) is the referral center for TB in Cambodia. The NTP team and the staff of the NTP reference laboratory are based at CENAT in the city of Phnom Penh.

Through CENAT it is expected that activities will progress in a more efficient manner than previously. However resources of CENAT have been limited, which restricts their activities in the control of TB. In recent years, CENAT's role has become more necessary.

Under such circumstances the GOC requested the Government of Japan for Project-Type Technical Cooperation (PTTC) for the "TB Control Project" in order to improve and enhance the implementation capability of NTP's TB control activities by focussing on the training of TB control personnel in CENAT. In response to this request, the Basic Survey Team and the Preliminary Study Team for Cambodian TB Control Project visited Cambodia from March 1 to 8, 1998 and May 24 to 31, 1998 respectively. The Implementation Study Team for PTTC was dispatched to Cambodia in June, and the Record of Discussions (R/D) was signed on June 16, 1999. This TB Control Project (PTTC) started in August 1999.

The buildings, facilities and equipment at CENAT (which is presently the referral center for TB and which is planned to be the activity base for the PTTC) have been becoming superannuated. Therefore, the GOC has requested Grant Aid from Japan to renovate the buildings, facilities and equipment in CENAT to improve the reference laboratory capability and strengthen the training function in monitoring and clinical activities.

As the direction of the PTTC program has been established, the Government of Japan decided to conduct a Basic Design Study to confirm the necessity and urgency of the Grant Aid Project. The study was entrusted to the Japan International Cooperation Agency (JICA). JICA dispatched a Basic Design Study Team on the Project for Improvement of the National Tuberculosis Center in the Kingdom of Cambodia (hereinafter referred to as "the Project"), headed by Dr. Masashi Suchi, Chief, Project Development and Management Division, Department of International Cooperation, The Research Institute of Tuberculosis, Japan Anti-Tuberculosis Association, from April 1 to May 5, 1999 to make the basic design survey. Subsequently, the Study Team prepared the Draft Report on Basic Design Study, and JICA dispatched a Draft Report Explanation Team, headed by Dr. Masashi Suchi, from July 13 to August 5, 1999 to explain and confirm the basic design to the Cambodia side. Based on the basic design, the Study Team proceeded to prepare the drawings in detail in Japan, and prepared the Draft Final Report on Basic Design Study including drawings and technical specifications. JICA dispatched a Draft Final Report Explanation Team, headed by Dr. Masashi Suchi, from October 24 to November 12, 1999 to explain and confirm the result of the Basic Design Study to the Cambodian side.

1-2 Components of the Request

The outline of the Request from GOC to the Japanese Government has been carefully examined for its propriety and necessity based on the result of the preliminary study by the Japanese Government.

The Basic Design Study has been carried out to confirm the studies conducted by the Basic Survey Team and/or the Preliminary Study Team for PTTC. The Basic Design Study has also examined and analyzed the written request submitted by the National Tuberculosis Center, Ministry of Health, the Government of Cambodia.

[Outlines of the Project]		
1) Overall Goal	:	To reduce the incidence and prevalence of TB in Cambodia.
2) Project Goal	:	To strengthen the implementation system and capability of the National Tuberculosis Control Program
3) Output of the Project	:	To enhance the role of CENAT and to strengthen the activities of CENAT, and to improve the quality and quantity of TB control service provided.
4) Activities of the Project	:	
a) Contents of the Request		
Facilities	:	Renovation of National TB Center (Program Management Office, Administration Office, Laboratory Unit, Out-patient Unit, Pharmacy Unit, X-ray Unit, etc.)
Equipment	:	- Procurement of equipment necessary for enhancing managerial activities. - Procurement of equipment for training of the personnel. - Procurement of equipment for the reference laboratory function.
b) Undertaking by the Cambodian participants	:	- Budgets related to the project and NTP - Secure manpower - Establishment of Administration and Management System - Training of all personnel who are implementing NTP (a part of project-type Technical Cooperation)
5) Project site	:	In the compound of National TB Center in the City of Phnom Penh.
6) Direct and Indirect Beneficiaries	:	Direct beneficiaries – Attendants to CENAT All health personnel engaged in TB control program. Indirect beneficiaries - All TB patients, whole population

In the Project Proposal submitted by GOC, although proposed drawings for new buildings were attached, there is no explanation of the basis of the design. In the Preliminary Study Report, it is pointed out that some existing rooms and some rooms necessary for the new building are not included in the drawing attached to the Project Proposal. In addition, at the beginning of the survey, the Cambodian Side requested that ward buildings be added to

the project. It was decided that these would not be included in this project. The Study Team confirms the components of facilities, size and specifications of rooms required one by one through a series of discussions with the Cambodian Side during the Basic Design Survey.

As for the equipment required, an "Equipment List" was attached to the Project Proposal submitted by GOC. CENAT procured some equipment through a Japanese Grant Aid Project in 1993. Therefore, the requested equipment was studied and prioritized based on the necessity and the equipment to be provided by PTTC.

CHAPTER 2
CONTENTS OF THE PROJECT

CHAPTER 2 CONTENTS OF THE PROJECT

2-1 Objectives of the Project

The objective of the Project is the renovation of the facilities at the premises of CENAT (north side areas only) and the supply of equipment for TB diagnosis/treatment and training to strengthen the role of the NTP and promote CENAT as the National Reference Center for TB control in Cambodia in cooperation with PTTC.

We envisage that the ultimate goal of the Project is to contribute to the accomplishment of the NTP in Cambodia.

2-2 Basic Concept of the Project

2-2-1 Policy of the Cooperation

(1) Contents of the Project and Basic Concept

The results of a series of discussions with MOH and CENAT during the Basic Design Study, the Draft Report Explanation Study and the Draft Final Report Explanation Study, are contained within three of the Minutes of Discussions (M/D) which were signed on 9th of April, 28th of July and 4th of November, 1999 respectively. The contents of the request for facility construction and procurement of equipment were confirmed as shown in ANNEX-1, 2 of the M/D signed on 28th of July, for the Explanation of Draft Report. The following points have been confirmed to be the basic direction for the implementation of the Project.

1) The tentative plans of the facilities and equipment were ascertained through discussions with CENAT based on ANNEX-1,2 of M/D signed on 9th of April. The Basic Design was established after further studies and discussions in Japan between the experts and persons concerned with PTTC and the Study Team. The Basic Design Drawings were explained and generally confirmed by the Cambodian Side at the Draft Report Explanation Study. Based on the result of discussions with the Cambodian Side, the further study was held in Japan. The results of the detailed studies were explained to and confirmed by CENAT through a series of detailed discussions at the stage of Draft Final Report Explanation Study.

2) The construction site for the Project is confirmed as shown in ANNEX-III of M/D signed on 28th of July.

3) In compliance with the Basic Policy of Japanese Grant Aid Projects, preparation work of the site and preparation of necessary infrastructure shall be dealt with by the Cambodian Side. The following undertakings shall be completed by the commencement of the construction: demolition of the existing buildings within the site, land grading, preparation of necessary infrastructure and movement of the city transformer building from its present location to a new suitable location.

4) The contents of facilities are shown in ANNEX-1 of the M/D's signed on 9th of April and 28th of July. In addition, the following two points shall be recognized.

   a) Renovation of the wards and facilities related to Hansen disease shall not be included in this Project.

   b) The necessity for, and the appropriate size of the Conference room and Dormitory (shown in ANNEX-1 of M/D signed on 9th of April 1999, for the Basic Design Study) have been studied further. As the result of further studies in Japan, it was concluded that the Conference Room should be reduced in scale and divided into three rooms which can be converted to one large room by removing movable walls (and be designated as "Classrooms") and that the Dormitory shall not be included in the Project.

5) Regarding the Equipment Plan, it is basically concluded that equipment which strengthens the training, and laboratory examination functions shall be selected. In Dispensary and X-ray sections, only essential equipment shall be considered. The final items and quality of each piece of equipment shall be decided through further detailed studies in Japan.

(2) Items to be noted for Basic Design

The following items are to be noted for Basic Design:

1) The basic design of facilities and equipment has been formulated through a series of discussions with CENAT and MOH, and also with the experts of PTTC, with concrete plans prepared by the Study Team, in consideration of the functions and activities required of CENAT.

2) It is confirmed that the Cambodian side is responsible for the Development Budget. This will include the cost of preparation of the Project site including demolition of existing buildings, land grading, and preparation of the infrastructure to the Project site, etc. The tentative estimation of the Development Budget was prepared by the Study Team and submitted to CENAT and MOH during the Draft Report Explanation Study. The result of the studies and discussions during the Draft Report Explanation Study and the Draft Final Report Explanation Study, the budget

and implementation schedule of Cambodian side work were confirmed between the Cambodian Side and the Study Team. In particular, it was confirmed that the site preparation work, including demolition of the existing buildings and grading of the land will be completed prior to the commencement of the construction work of the Project. The relocation work of the Electrical Transformer in the Project site to the ward side is to be carried out by Cambodian side with the support of the World Bank (WB) Loan.

3) As for the operation and management of CENAT after the completion of construction, the following points were discussed and confirmed with the Cambodian Side.

   a) Running Cost: The implementation budget for NTP has been supported by the WB loan and other donors. However, the running cost of electricity and water supplies presented in paragraph 3-2-2 of the "Operation and Management Plan" was confirmed to be prepared by MOH at the stage of Draft Final Report Explanation Study.

   b) Staff arrangement: The numbers of medical, technical and administration staff of CENAT seems to be sufficient, however there are presently only few staff for maintenance of facilities in MOH. Establishment of maintenance system and recruitment of additional staff or training for existing staff were requested to CENAT and MOH, and it was accepted at the Draft Final Report Explanation Study stage.

4) In order to prevent excessive operation and maintenance costs, consideration shall be given to "low maintenance" or "maintenance-free" in the facility and equipment design.

5) CENAT's anti-tuberculosis control activities should be uninterrupted even during the period of construction of new facilities. Therefore, the existing patient ward will be used as an Out-patient Department/Clinical Laboratory and the old Mother and Child Health Center as an Administration Department. The Cambodian side will take necessary steps for this temporary relocation so that inconvenience to patients and medical staff will be minimized.

6) Smooth relations between this Grant Aid Project and Technical Cooperation shall be established for the implementation of the Project. The Implementation Schedule shall be planned in coordination with Schedule of PTTC.

2-2-2 Study Result and Examination of the Contents of the Request

The request for the Project from the Cambodian side is a) Renovation of facilities, and b) Procurement of Equipment for the improvement of CENAT. The study result and examination of the contents of the request are reported as follows.

(1) Facility Plan

1) Confirmation of the Contents of the Request

The function, staff numbers, and number of rooms required for each of the following 10 sections of CENAT were explained in the initial application for Grant Aid from the Cambodian Government.

① Program Management Office
② Administration Office
③ Accounting Office
④ Technical Office
⑤ Laboratory Unit
⑥ X-ray Unit
⑦ Pharmacy Unit
⑧ Out-patient Unit
⑨ Garage and Driver Unit
⑩ Ward (This section is not included in the Project)

2) Issue of the Contents of the Request

a) The proposed site layout plan and plan for each floor of the 2 storey building was attached to the applications. However the basis for the computation of the size of each room was unclear, and there were several discrepancies between room descriptions and requirements and the drawings were insufficient. This matter should be studied and the plans revised as appropriate.

b) Study of the rooms required for CENAT was requested taking into consideration the relation with the future activity plan. Some essential rooms were lacking and some rooms were too small on the proposed drawings.

c) Some rooms are very small, and some rooms are ineffectively arranged within the buildings. In order to correct this, a functional analysis of each section of the building as well as coordination of entire sections of the building is required.

d) Common spaces such as corridor, staircase, toilets, and others, which were not individually identified in the proposal shall be considered, in order to determine the overall size of the facility.

3) Study of the contents of the Request

The above mentioned issues together with the proposed drawings supplied by the Cambodian side were carefully studied and discussed at the Basic Design Survey stage. Consideration was given to the existing problems and likely function or activity plans of CENAT. As a result of the studies, the contents of the request for facilities was concluded as shown in ANNEX-1 of M/D signed on 9th of April, 1999. Subsequently the Basic Design Study Team and CENAT have continued detailed discussions and studies in order to clarify the size and function of each room in each section. Important issues are summarized as follows:

a) Renovation of wards and facilities related to Hansen Disease Control Program shall not be included in the Project.

b) The Conference Room and Dormitory were considered to be necessary for the purpose of strengthening the training function of CENAT in the Basic Design Study. After further studies in Japan, the following was determined:

i) A dormitory shall not be included in the Project because of security, operation and management matters and insufficient size of the Project site.

ii) Based on the analysis of the proposed future training program of CENAT, it was understood that the frequency of large scale seminars for 200 persons which require use of the Conference Room is less than 10 days per year. The demand for the Classrooms for 30 – 40 persons or less than 15 persons are high. It was also considered that less than 60 persons per class is appropriate for effective training. As a result of further study in Japan, it was decided that the new facility of CENAT shall include three Classrooms, which can be converted to one Large Room for large seminars by removing the movable walls, instead of a Conference Room.

c) Study of total facility scale:

As the result of detailed studies of the contents and scale of each required room, considering function and staff numbers, and paying careful attention to avoid any over estimate of size, the total floor area required for the new building was estimated as approximately 3,600m^2 including common spaces. However, after further studies in Japan including the above mentioned items a), b) and other revisions, the total floor area has been reduced to approximately 3,000m^2.

d) Study of Detailed Plan:

Study of detailed plans for each room (using 1/100 scale drawings) has been carried out in order to confirm the detailed function and equipment plan in each room and the scope of the Cambodian side for procurement of furniture considering layout of equipment and furniture. Through this study, the appropriate size of each room has also been confirmed. Especially for the Dispensary, Laboratory and X-ray sections, which are key sections for CENAT, discussions were held with CENAT staff, as far as was practicable (Refer to "2-3-2 Study of Design Criteria"). These studies of detailed plans have become the basis of the Basic Design of the facility and equipment.

(2) Design of Equipment

1) Confirmation of Requested Equipment

The equipment requested by GOC (shown on the "Equipment List") consists of facilities, office furniture, training furniture, medical equipment and training equipment. The office furniture is excluded from the scope of the Project since it is not appropriate to JICA's grant aid objectives. The general term "equipment" has been used in the following text to include medical/training equipment and training furniture.

2) Investigation of Requested Equipment

The equipment which has been requested by GOC and which was indicated on the attached "Equipment List", is aimed mainly at:

- strengthening of the functions of TB examination and diagnosis,

- training of personnel involved in the activity of TB control and epidemiological surveillance,

- management of TB control activity.

A list of requested equipment was prepared in 1996. This has been used as the basis for the formulation of the current equipment list.

Information on the condition of existing equipment was also recorded in 1996. The current working condition of the existing equipment and the possibility to continue using existing equipment in the new facility which is to be constructed under the Project will influence the selection of new equipment. Therefore, addition to, and modification of, the requested Equipment List has been made on the basis of the current operating conditions and possibility of continuing usage of existing equipment in the future.

There are several items of equipment on the requested Equipment List which appear to be necessary for the TB control activities, but studies are required to determine whether it should be included in the Project or not. These items of equipment were prioritized as category "B" at the time of the site survey, and were studied further in Japan together with experts in TB control and with persons to be involved in the PTTC.

2-3 Basic Design

2-3-1 Design Concept

The basic design of the facilities and equipment in the Project is based on the following design policies with due consideration of the result of the field survey, the environmental and social conditions of Cambodia, the construction and procurement conditions, the maintenance and management ability of the facility and equipment and construction schedule under Japan's Grant Aid assistance:

(1) The new facilities and equipment should be planned based on the Basic Design Study, and must give consideration to the level and quality of the facilities and equipment required to fulfil CENAT's functions such as Policy Making, Training, Research, Evaluation and Monitoring, Diagnosis and Treatment, etc., and future activities.

(2) The new facilities and equipment should be planned in coordination with the PTTC. Also, regarding selection of equipment, coordination and/or cooperation with the PTTC, which started in August 1999, and other donors should be considered.

(3) The new facilities and equipment should be arranged to meet the functional concept of the existing facilities so as to coexist effectively as a whole.

(4) Especially for the facility planning, the site layout should be planned with consideration of functional layout and effective flow of the patients and staff including the Ward Area.

(5) The meritorious aspects of design of relevant facilities in Cambodia and Japan should become a reference for the design. The existing problems of the building should be improved in the plan.

(6) The new facilities should be designed giving consideration to the local weather conditions (rain, sun and wind). Natural ventilation and natural lighting should be considered as much as possible in order to minimize running costs of electrical lighting, air-conditioning and mechanical ventilation. Also, local customs should be considered in the design of new facilities (e.g. toilets).

(7) The design of facilities and utilities, and selection of equipment should be carried out with due consideration to reduce the maintenance and operation costs.

(8) Local construction methods and materials should be considered and used as much as possible. Long-term recurrent costs as well as the initial cost should also be minimized.

2-3-2 Study of Design Criteria

(1) Basic Concept for the Determination of Contents and Scale of the Facilities

The determination of the content and size of the facilities (which will be confirmed by the study of the number of rooms and the size of each room) is not only dependant on the function of the facilities, but it will have an important effect on the future operational budget as well as on the activities of CENAT. Based on these considerations, the basic concepts for the determination of the contents and size of the facilities are established as follows:

1) The facility plan will be established based on the Minutes of Discussions between the Cambodian MOH and the Basic Design Team, taking a reasonable and economic point of view.

2) From an architectural planning perspective, the unit area per person, which is the basis of floor area calculation for each room, has a wide range. Therefore, in this case the size of the major rooms will be confirmed based upon studies of the layout plans of the equipment which is required. The number of rooms will be minimized. Optimum design of the facilities will be formulated through studies of the existing CENAT facilities and other similar facilities in Phnom Penh.

3) The objective of the Project is to develop a referral center for TB. The method for determination of the size of each room is not the same as for other ordinary buildings. The basic unit size for laboratory, training or educational rooms must be considered for the design of the facility. The intended function of the facility, and safety of buildings also need to be taken into consideration for planning of rooms.

4) The functional layout and zoning of the new facility should be planned giving consideration to the inside flow lines of out-patients, staff and services, and outside flow lines connecting new facilities to other zones including hospital wards.

5) The number of rooms and size of each room should be calculated and planned based on the activities and number of staff confirmed in the Basic Design Study and Draft Report Explanation Study.

6) The places where people work (laboratories, training rooms, examination rooms, etc.) should be effectively designed and organized. The information obtained from the Basic Design Survey will form the basis to formulate the design concept of such rooms.

6) The new staffing schedule and organization of CENAT has been prepared by the Cambodian side. The scale of the facilities is to be reasonably determined based on this schedule.

(2) Study for the Number of Rooms

The contents of the request from GOC regarding facilities were confirmed during the Basic Design Survey (the Minutes of Discussions on April 9, 1999). The Basic Design Survey Team had discussion with the Cambodian officials concerned in order to examine the contents of the request, and to formulate the list of Requested Items for the facilities. The Basic Design Study Team then studied the layout planning and architectural planning of the facilities based on the list of rooms shown in the M/D Annex-1 on April 9, 1999. The rooms shown on the table have been studied with the person in charge of CENAT to determine the room size and floor layout. CENAT's future training program was also discussed, in order to determine the number of rooms which will be required for training purposes.

Subsequent to the above mentioned discussions, the Basic Design Study Team continued the study in Japan. Based on the result of this study, further discussion was held with CENAT during the Draft Report Explanation Study to confirm the number and name of rooms and the size of each room. The results of the series of discussions are shown in the M/D Annex-1 on July 29, 1999.

The above mentioned studies have been carried out on the assumption that the room for the chief and the room for the staff will be combined to one large room, and that storage will be shared as much as possible with other sections.

1) Dispensary Unit

The rooms required in the Out-patient department consist of: Consultation (& reception) rooms, Physiotherapy room, Patients education room, Home care DOTS office, Waiting lobby, and Staff room.

At the Basic Design Study, it was decided to provide two booths for consultation and one booth for diagnosis of serious cases. As a result of the Draft Report Explanation Study, they were to be called Consultation Room-1, 2, and 3, from the point of view of maximization of use. Consultation Room-1 is for the newly diagnosed TB cases, Consultation Room-2 is for cases under continuation phase of TB treatment, and Consultation Room-3 is for diagnosis of patients, based on the results of Laboratory tests or X-ray films. In the Consultation Room-1 and 2, Medical Assistants will make consultations, and a Medical Doctor will stay in Consultation Room-3. Since there are on average 20 out-patients per day and 3 – 4 new TB cases per day, coordination of the consultation space is possible.

Medical records must be maintained in areas where Doctors and Nurses can easily retrieve them. Since the number of newly diagnosed TB cases is approximately 800 patients per year, shelf filing or filing cabinet are most appropriate for the storage of medical records. Medical records (carte) for current patients will be kept in the Reception Room and that for non-current patients will be kept in the Dispensary Staff Room.

2) Laboratory Unit

The laboratory department requires Smear Examination Laboratory and Laboratory for General Examination for out-patients, Research Laboratory for culture and drug susceptibility test, Training Laboratory, Preparation room, Reagent preparation room, Laboratory staff room and Storage, etc.

The average number of examinations is 61 per day. 58 out of 61 cases on average are smear examinations of both out-patients and in-patients. The general laboratory carries out hematology, biochemistry and parasite tests, of 3 – 4 samples per day on average, however it is expected that this number will be increased in the new facility. Two laboratories are therefore needed, one laboratory for sputum examination and one laboratory for general examination.

Table 2-3-1 Number of examinations

Number	Sputum Ex.	Hema-Ex.	Biochemical Ex.	Parasites
Per year	13,819.0	288.0	369.0	134.0
Per month	1,152.0	23.9	30.7	11.1
Per day	57.6	1.2	1.5	0.6

The research laboratory is mainly used for culture and drug susceptibility test for tuberculosis. It is placed on the second floor as a referral laboratory for NTP.

The microscopy is the standard tool for TB diagnosis in the laboratories of TB Unit in Provincial and District Hospitals and local health centers. In spite of the important role of the microscopy in the laboratory, personnel have little training in its use. Therefore, a number of training courses for microscopy have been carried out, and will be conducted in CENAT for the supervisors at the Provincial level, health staff who are managing laboratory examinations, and laboratory technicians from TB units in Provincial and District Hospitals, Health Centers, and Private Clinics.

The Reagent Preparation room is the center for manufacturing/distribution of the reagents for the acid-fast smear examination (staining) which is carried out every 3 months. The reagents prepared are distributed to TB units throughout the whole country through CMS (Central Medical Store). Approximately 1,000 liters of reagent is manufactured each time. Therefore, the Reagent preparation room and reagent storage are placed adjacent to the garage in consideration of the convenience

of transporting materials to and from this room, though reagent manufacture was planned to be carried out in the preparation room for the research laboratory at the beginning of this study.

3) Radiology Unit

The X-ray division requires X-ray room, Operation room, Dark room, Waiting lobby, Bronchoscope & ECG room and X-ray staff room. The X-ray unit is on the ground floor adjacent to and part of the out-patient service.

The number of patients examined per day is 35 on average, and sometimes, such as the day after a holiday, it is more than 60. Approximately 70% of the patients come from the out-patients division, and the remaining 30% come from other health facilities, such as private hospitals and clinics, etc. The time required for one chest radiography is 5 to 6 minutes per person and in the morning almost 50 cases are examined. Most patients come in the morning.

Whilst a room for X-ray film storage was requested, it is proposed that the film will be stored in a cabinet in the X-ray room. The patients retain their own film under the present system, and if the system is changed, the cabinet has enough space because of the number of patients, so no additional storage is necessary.

In CENAT, MD for radiology make a consultation after taking X-ray. So the space for reading the film and consulting with the patients is placed in a corner of the staff room.

At the beginning, two X-ray rooms were requestedd to accommodate a new machine (to be installed by the Project) and the existing machine. It is not envisaged that the two machines will be used in parallel. One X-ray room is therefore proposed.

Bronchoscopic and ECG examinations will be carried out in the physiological function test room on the first floor. These examinations are done using existing CENAT equipment. The physiological function test is expected to be performed more often in the future. This test includes tests using ultrasonic apparatus, which is yet to be installed. Some additional space should be allocated for the installation of this equipment at a later date.

4) Pharmacy Unit

The pharmacy division requires Drug storage, Medical material storage, TB drug distribution room (TB drug for out-patients), Pharmacy (TB drug for in-patients and general drugs), and Pharmacy office for staff.

As a DOTS strategy, the patients have to take medicines at the TB drug distribution room. Therefore the TB drug distribution room will be separated from the Pharmacy for in-patients and other general drugs.

5) The Program Management Division includes a Director's office, Vice director's office, Secretary room, Reception space, Adviser's office, and JICA expert office. The rooms in this division should be adjacent to each other because the tasks of the staff which they accommodate are directly related to NTP.

6) The Administration and Accounting division includes each chief and staff room in one space, and a space for storage. These rooms should be placed adjacent to the program management division room.

7) The technical division includes staff room, Statistics and Planning room, Library, Class Room-1, 2 and 3, and Meeting room. The functions of this division are collecting and analyzing statistical data, policy making and planning (based on data analysis), training for health personnels working for TB control, making reports for their activities and so on. This division carries out one of the key roles of the NTP.

Conference Room, Meeting Room and Classrooms

Conference room was strongly requested during the Basic Design Survey. However, during the Study in Japan subsequent to the Basic Design Study, provision of the room has been reconsidered. Taking into consideration both training programs which are presently being conducted, and the future training plans, it is clear that there will be few occasions when space for 200 persons will be required (less than 10 days per year). According to the future training plans, the most frequent requirement is a room for 60 persons. It has been determined that lectures and seminars are more effective if the group is limited to 60 persons. On the occasions when a larger room is required, such as the National TB day, MCH's conference room which was also built by Japanese Grant Aid is available for use. As a result of this study, it was proposed to CENAT that the size of Conference Room would be reduced and designated as a Large Meeting Room.

During the Draft Report Explanation Study, this matter was discussed with the Cambodian side again. As a result of the discussions, it was confirmed that the Conference room will be divided into three rooms (2 rooms:6m x 7m, 1 room:3m x 7m) as Classroom – 1, 2 and 3 with movable partitions and these can be converted to two rooms or one large room by removing the walls.

Two medium size meeting rooms were originally requested; one meeting room in the Technical Office and the other meeting room in the X-ray Unit for multi-purpose use. However, based on the analysis of the training program and its schedule, only one room was proposed and confirmed by the Cambodian side.

The current plan makes optimal use of space.

(3) Determination of the Size of Each Room

The size of the facility will be determined based on the existing facilities at the CENAT, other similar facilities (projects) undertaken by Japan's Grant Aid and the standard data of the Architectural Institute of Japan.

1) DispensaryUnit

From the point of view of the maximization of use and the improvement of management efficiency, consultation rooms for new cases, continuations, and diagnosis will be the same size. These consultation booths are necessary for conducting interviews and diagnosis, for first visit and revisit, and will be placed as is illustrated in Figure 2-3-1. Staff circulation is facilitated by the provision of a perimeter corridor.

In this project, the scale of each booth is determined to be 15 m^2 (3m x 5m) in consideration of space for examination bed and desk. The space for patient's attendants, who usually enter the booth with patients in Cambodia is also provided. Considering that the size of the consultation booth of MCH is 3.0m x 4.4m = 13.2m^2, the proposed scale is appropriate.

In each consultation booth, a desk is located on one side and an examination table (approximately 1.8m x 0.6m) on the other side. The area close to the patient's entrance door allows space for attendants and shelves for filing.

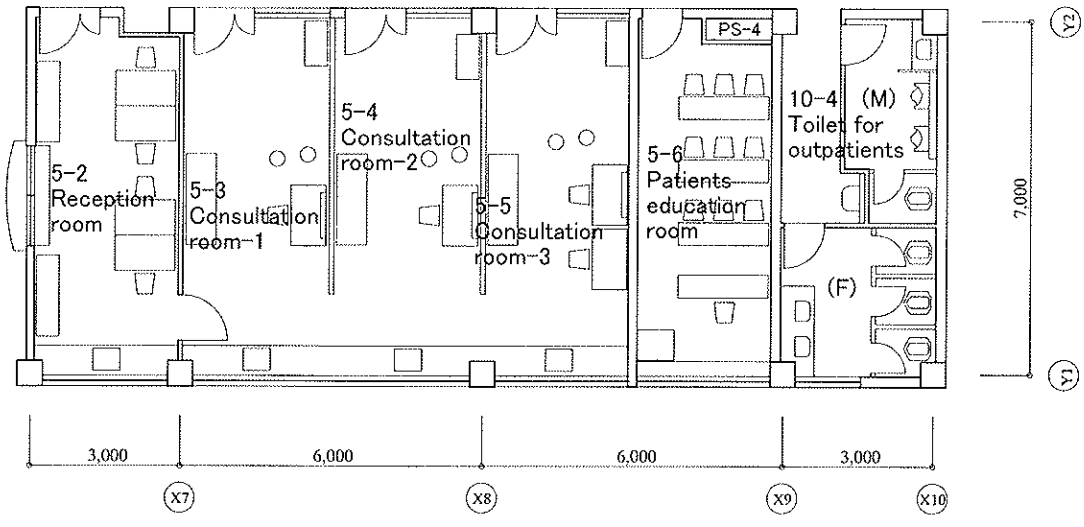


Fig.2-3-1 Out-patient Unit

2) Laboratory Unit

a) Laboratory and Smear Examination Laboratory

The floor area of the laboratory will be calculated based on the number of staff who will work in the laboratory, and the proposed layout of the equipment. The number of staff belonging to each laboratory is between 5 to 7.

The standard unit area for a laboratory has a wide range (5.0–10.0 m^2/person) depending on the contents of examination research activities. Therefore, considering personnel circulation, and the layout of the equipment, the floor area of each laboratory is calculated as 6.0m x 7.0m = 42.0m^2(6.0 ~ 8.5m^2/person). The standard module of 6m x 7m for laboratory unit is adopted.

Comparing with the Tropical Disease Center in Indonesia, where the floor area of the laboratory is calculated as approximately 5.6m^2/person, the proposed scale is reasonable.

Layout of the laboratory equipment will be based on consideration of the activities and work flow in the laboratories. It is confirmed that the laboratory tables will be placed at the center of the rooms to be used from both sides, and along the walls to make efficient use of wall side.

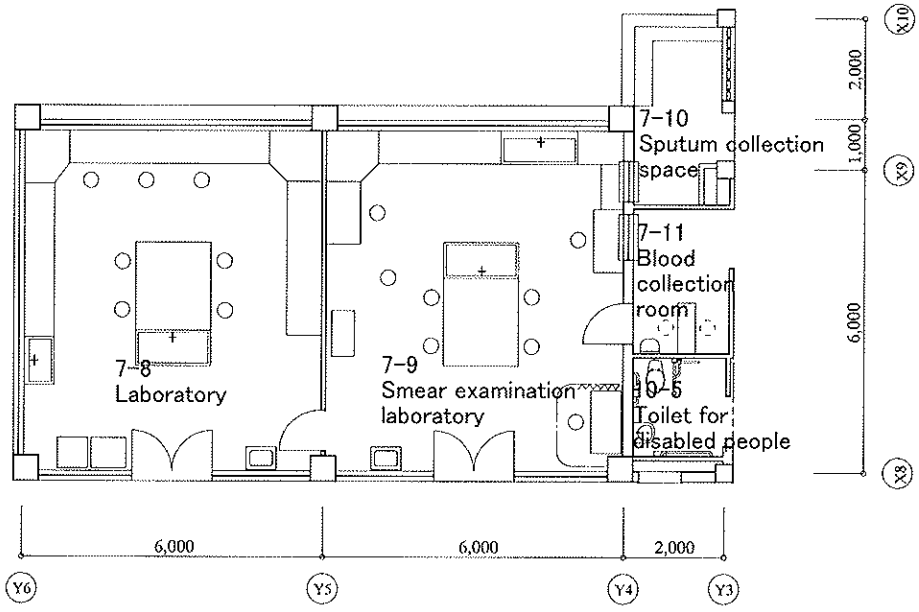


Fig.2-3-2 Laboratory and Smear Examination Laboratory

b) Research Laboratory

The Research Laboratory is used as the National TB Laboratory for the culture and drug susceptibility test of tuberculosis. The number of staff who will work in this room is between 5 to 7. The floor area of this laboratory is calculated as 6.0m x 7.0m = 42.0m^2 (6.0 – 8.5m^2/person) same as above laboratories. The laboratory table, in the same style as above, will be placed at the center of the room to be used from both side, and along the walls, incubators, deep freezer, water distiller, laboratory tables (side type), etc. will be placed.

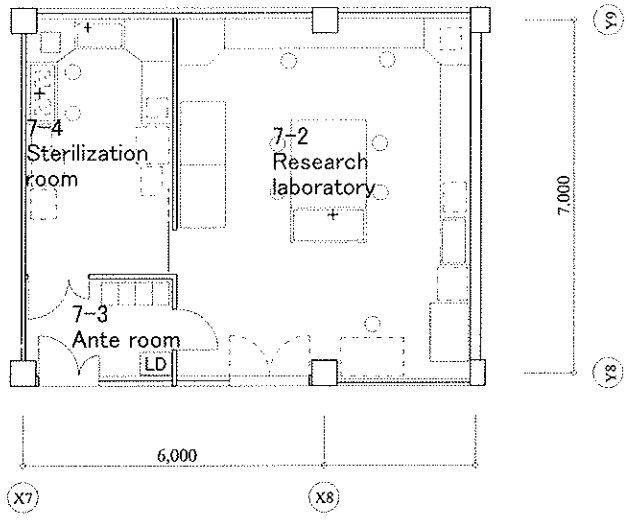


Fig. 2-3-3 Research Laboratory

c) Training Laboratory

The microscopy training room is designed to accommodate maximum 12 trainees. The trainees usually work together in groups. Two tables with sink for six persons will be provided. Two benches and two safety cabinets are therefore required. The lecture table is designed to facilitate the presentation of demonstrations. The floor area of this room is calculated as 9.0m x 7.0m = 63.0m^2 (4.8m^2/ trainee).

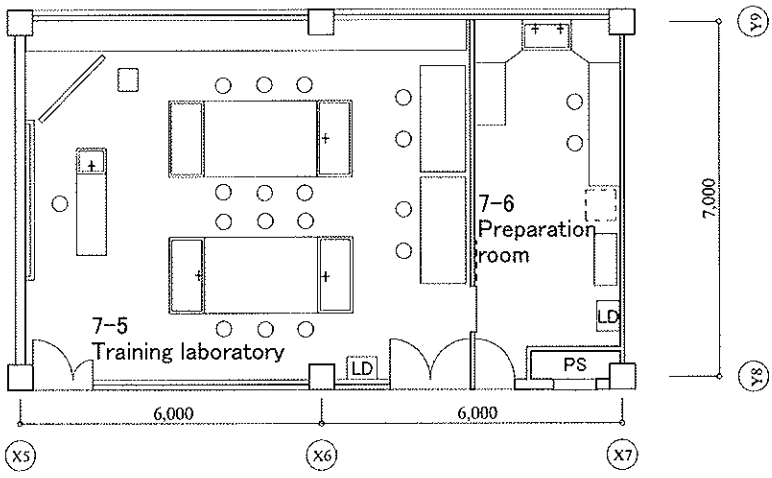


Fig. 2-3-4 Training Laboratory

3) Radiology Unit

a) X-ray Room

The size of the X-ray room is dependent on the type of machine and examinations carried out. In CENAT, the major use of the X-ray room is for chest X-rays, and X-ray machine with Bucky table and stand will be installed.

The X-ray room requires special measures to protect against radiation hazard, e.g. lead wall finishes.

The floor area of the X-ray room in Nepal's NTC is 22.5m^2, in MCH 36m^2, and in Calmette hospital 27.5m^2. In this X-ray room, not only one new machine but also the existing machine will be placed in case the new machine is broken, therefore the floor area of the X-ray room is calculated as 42m^2 (6m x 7m).

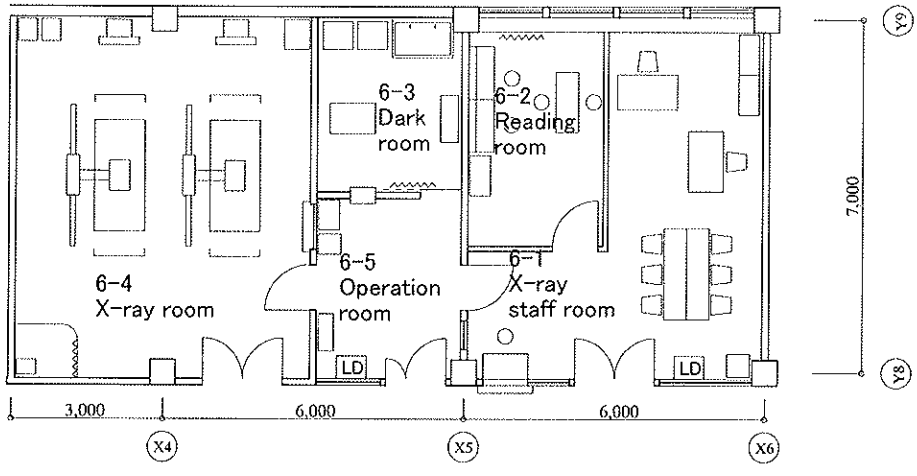


Fig. 2-3-5 X-ray Room

b) Bronchoscope & ECG Room

Both bronchoscopic and ECG examinations are considered to be carried out in this room, and the existing equipment will be installed. It is possible to place these two machines in the same room, because the number of cases examined is from 2 to 3 per week. Standard minimum space for bronchoscopic room is considered as 3m x 4m. However, in this case, electrocardiography is placed in the same room, and ultrasonic apparatus will be installed in future. Therefore the floor area of the Bronchoscope & ECG room is calculated as 42 m^2 (6m x 7m).

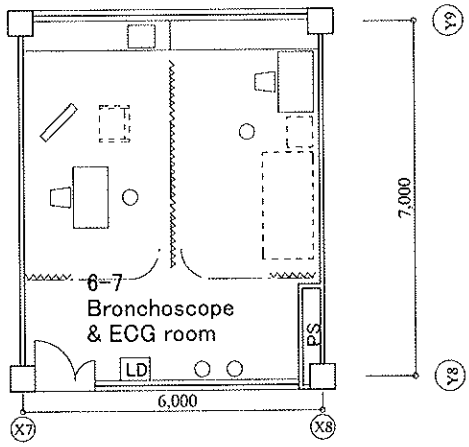


Fig. 2-3-6 Bronchoscope & ECG Room

4) Technical Bureau

a) Classroom/Meeting Room

A number of factors must be considered in determining the desirable size of the class rooms and meeting room. Several kinds of space pattern will be produced by the arrangement of movable partitions.

As mentioned above, 3 classrooms are planned, and these can be converted to one or two rooms by removing the movable walls. The capacity of each room is shown in the following table.

Table 3-3-2 Capacity Comparison of Classrooms and Meeting Room

<table>
<tr><th></th><th colspan="4">Floor area</th><th colspan="3">Number of Chairs (with desk)</th><th colspan="3">Number of Chairs (with wing desk)</th></tr>
<tr><td>Class room-1</td><td>42m^2</td><td rowspan="2">84m^2</td><td rowspan="2"></td><td rowspan="3">105m^2</td><td>Approx.. 24 seats (1.84m^2/per.)</td><td>Approx. 50 sets (1.5m^2/per.)</td><td rowspan="3">Approx. 72 sets (1.45m^2/per.)</td><td>Approx. 36 sets (1.6m^2/per.)</td><td rowspan="2">Approx. 90 seats (0.9m^2/per.)</td><td rowspan="3">Approx. 117 seats (0.9m^2/per.)</td></tr>
<tr><td>Class room-2</td><td>42m^2</td><td rowspan="2">63m^2</td><td>Aprx. 24 seats (1.84m^2/per.)</td><td>Approx. 50 sets (1.5m^2/per.)</td><td>Approx. 36 sets (1.6m^2/per.)</td></tr>
<tr><td>Class room-3</td><td colspan="2">21m^2</td><td colspan="2">Approx. 14 seats (1.5m^2/per.)</td><td colspan="2">—</td></tr>
<tr><td>Meeting room</td><td colspan="4">42m^2</td><td colspan="3">Approx. 24 seats (1.84m^2/per.)</td><td colspan="3">Approx. 36 seats (1.16m^2/per.)</td></tr>
</table>

In the case of conversion of two classrooms to one room by removing the movable walls, it can be used for lectures for approximately 50 persons with desk. In the other case of conversion of three classrooms to one large room, it can be used for lectures for approximately 70 persons with desk, or to hold large meetings or special assemblies for more than 100 persons with chair with wing desk.

Generally 1.5-1.6m^2/person of floor area is allowed for lectures. Considering the case of the Institute of Nursing in Myanmar, the floor area is 80.0m^2 for 50 persons (1.6m^2/person), the proposed scale is appropriate.

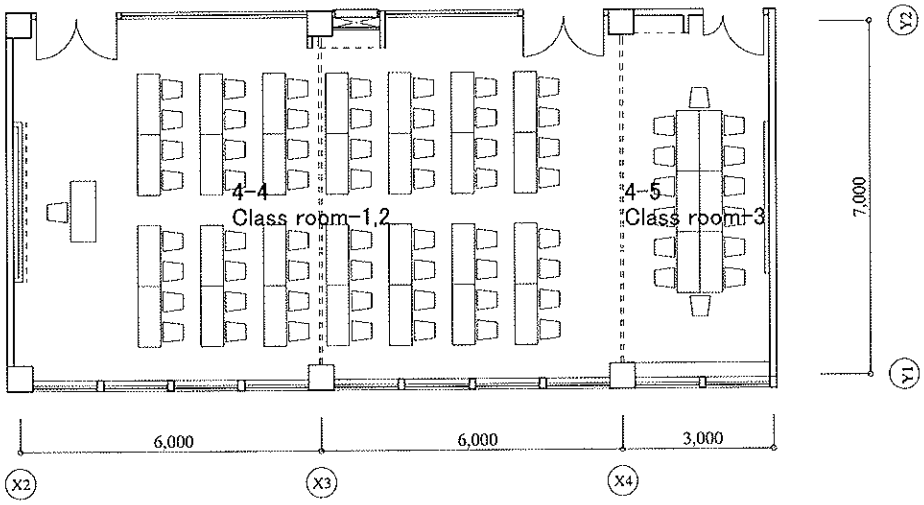


Fig.2-3-7 Classrooms

b) Library

The floor area of library was considered as 42.0m^2 converted to the initial requirement by CENAT. However, in order to keep space for storage of approximately 3,000 books, study space for 24 persons, staff space and counter, it has been calculated as 63.0m^2 (9.0m x 7.0m).

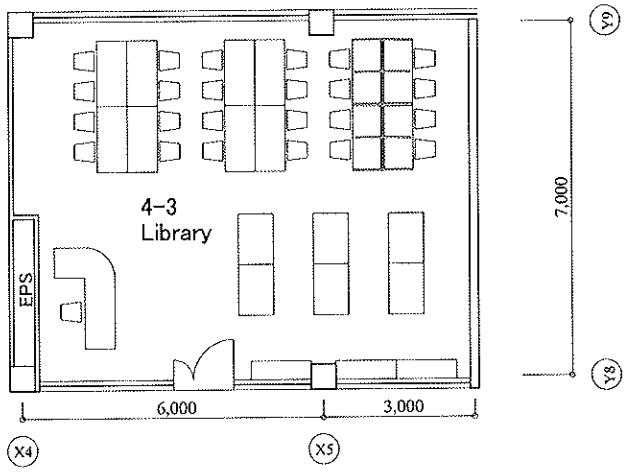


Fig. 2-3-8 Library

c) Statistics and Planning Room

This room needs shelves for raw data and processed data, spaces for computer equipment, and space for 5 tables. The floor area of this room is calculated to be 42.0m^2 (6.0m x 7.0m) based on studies and considering space for the items mentioned above.

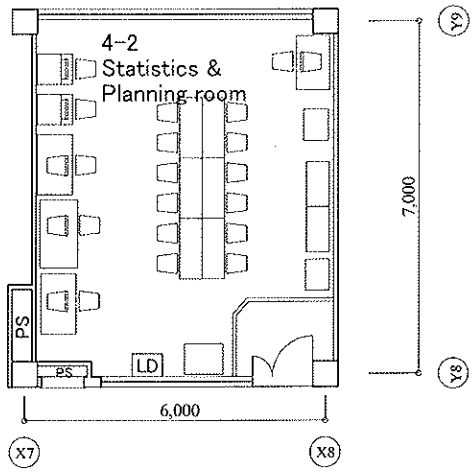


Fig. 2-3-9 Statistics & Planning room

5) Program Management Office

The director's office, the vice director's office and secretary room are arranged individually, and a reception space is included in the director's room. The area of the director's room is calculated as 24.3m^2, the vice director's room 19.6m^2, and secretary's room 13.5m^2.

For experts from JICA and other donors, two rooms of a basic module (6.0m x 7.0m) will be provided. The size of the room is calculated as 42.0m^2 based on the number of experts and considering the space for meeting table and necessary shelves.

6) Administration Bureau and Staff rooms

Originally, the rooms for chief and vice chief were required to be separated from the staff room. However, in order to ensure ease of communication between the staff, the chief and his secretary will be located in the large Administration Office. The area of the room is calculated as 63.0m^2 based on the number of staff.

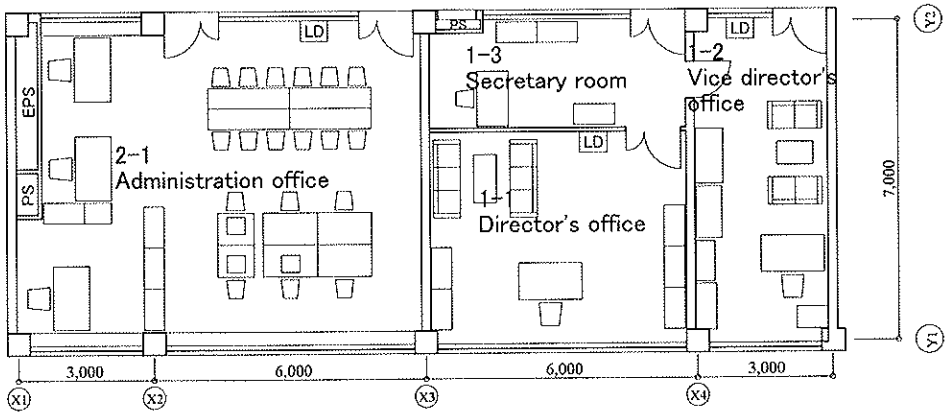


Fig. 2-3-10 Program Management Office and Administration Office

(4) Facilities Required and Area of Each Facility

Based on the discussions and study, the floor area of each room is summarized in Table 2-3-3.

Table 2-3-3 Required Rooms and Their Floor Area

Facilities	New reference No.	Old reference No.	No. of Rooms	Area (m^2)
1) Program Management Office				**168**
Director's office	1-1	1-1	1	27
Vice director's office	1-2	1-2	1	21
Secretary room	1-3	1-3	1	15
JICA expert office	1-4	1-4-1	1	42.0
Advisors office	1-5	1-4-2	1	42.0
Reception space	1-6	1-5	1	13.5
Storage- 6	1-7	1-6	1	7.5
2) Administration Office				**63.0**
Administration office	2-1	2-1, 2-2	1	63.0
3) Accounting Office				**105.0**
Accounting office	3-1	3-1, 3-2	1	42.0
Storage- 1	3-2	3-3		42.0
Storage- 4	3-3	3-3	1	21.0
4) Technical Office				**357**
Technical office	4-1	4-1, 4-2	1	63.0
Statistics & Planning room	4-2	4-4	1	42.0
Library	4-3	4-7	1	63.0
Classroom-1,2	4-4	10-1	2	84.0
Classroom-3	4-5	4-6	1	21
Meeting room	4-6	4-5, 6-5	1	42.0
Storage- 3	4-7	4-3	1	21.0
Storage- 5	4-8	4-3	1	21.0
5) Dispensary				**270.0**
Dispensary staff room	5-1	8-1, 8-8 8-9	1	42.0
Reception room	5-2	8-1, 8-9	1	21.0
Consultation room- 1	5-3	8-3	1	21.0
Consultation room- 2	5-4	8-3	1	21.0
Consultation room- 3	5-5	8-6	1	21.0
Patients education room	5-6	8-2	1	21.0
Waiting lobby	5-7	8-7	1	81.0
Physiotherapy room	5-8	8-10	1	21.0
Home care DOTS office	5-9	8-11	1	21.0
6) X-ray Unit				**165**
X-ray staff room	6-1	6-1,6-2,6-4	1	42.0
Reading room	6-2	6-4		
Dark room	6-3	6-6	1	10.5
X-ray room	6-4	6-8	1	42.0
Operation room	6-5	6-10	1	10.5
Waiting lobby	6-6	6-7	2	18.0
Bronchoscope & ECG room	6-7	6-9	1	42.0

Facilities	New reference No.	Old reference No.	No. of Rooms	Area (m^2)
7) Laboratory Unit				**350**
Laboratory staff room	7-1	5-1	1	42.0
Research laboratory	7-2	5-4	1	42.0
Ante room	7-3	5-10	1	6.0
Sterilization room	7-4	5-5	1	15.0
Training laboratory	7-5	5-7	1	63.0
Preparation room	7-6	5-6	1	21.0
Laboratory storage	7-7	5-8	1	21.0
Laboratory	7-8	5-2	1	42.0
Smear examination laboratory	7-9	5-3	1	42.0
Sputum collection space	7-10	9-7	1	7.2
Blood collection room	7-11	5-11	1	6.8
Reagent preparation room	7-12	5-9	1	21.0
Reagent storage	7-13	7-4	1	21.0
8) Pharmacy Unit				**168.0**
Pharmacy office	8-1	7-1, 7-2,7-7	1	63.0
Drug storage	8-2	7-3	1	42.0
Medical material storage	8-3	7-6	1	21.0
TB drug distribution room	8-4	8-5	1	21.0
Pharmacy	8-5	7-5	1	21.0
9) Garage and Driver Unit				**94.0**
Garage	9-1	9-1	1	84.0
Drivers room	9-2	9-2	1	8.0
Toilet for drivers	9-3	9-9	1	2.0
10) Others				**1,378.2**
Laundry	10-1	9-3	1	21.0
Machine room	10-2	9-4, 9-8	2	111.0
Security room	10-3	9-6	1	15.0
Toilet for outpatients	10-4	8-12-1	1	17.0
Toilet for disabled people	10-5	8-12-2	1	4
Toilet for staff	10-6	10-2	4	109.5
Kitchen	10-7	10-3	3	12.0
Storage- 2	10-8	10-4	1	7.5
Common space (Corridors, Stairs and others)	10-9	10-5	1	1,072.2
LPG/Blower bldg.			1	9.0
Grand Total				**3,118.2**

(5) Design of Equipment

As described in 2-2-2 Study Result and Examination of the Contents of the Request, the equipment which is being requested by GOC and which is indicated on the attached "Equipment List", is aimed mainly at:

1) strengthening of the functions of TB examination and diagnosis,

2) training of personnel involved in the activity of TB control and epidemiological surveillance,

3) management of TB control activity.

Most of the equipment which is presently in use is in a serviceable working condition. In addition there is some additional new equipment, which has been procured by Japanese Grant Aid and other foreign aid projects, which has been kept in storage.

Discussions have taken place with CENAT representatives to determine what additional equipment is needed considering the possibility to use the existing equipment which is in good working condition, and considering equipment in storage.

1) Equipment List

The equipment requested by the Kingdom of Cambodia (and shown on the "Equipment List") consists of facilities, training furniture and equipment, and is classified into these three groups. The general term "equipment" has been used in the following text to include medical/training equipment and training furniture.

2) Discussion and Confirmation of Requested Equipment

The following points were taken into consideration during discussions in the Basic Design Study with representatives of CENET:

a) Based on the Equipment List, confirmation of the current condition of existing equipment and necessity of grant aid will be investigated.

b) The number of laboratory tables and chairs for the Laboratory Unit will be decided after some related information (such as number of trainees, space in each room, and the layout of the laboratory tables and equipment) are clarified.

c) Several items of equipment which have similar or equivalent performance have been requested by two or more different departments. Duplication of such equipment which may be shared will be given a low priority.

d) The number of pieces of equipment for meeting rooms and/or training rooms, such as white boards, will be adjusted as appropriate when the layout of the rooms becomes more definite.

e) Selection of equipment will focus on the strengthening of the training, laboratory and TB control functions. Equipment which has been requested for Clinical activities is considered to be less important and is ranked as "B" and will be the subject of further investigation in Japan.

f) Local procurement of photocopiers, personal computers, televisions, and videotape recorders will be investigated, taking into consideration their repair and maintenance. Warranty and maintenance contracts in respect of these items will also be investigated.

g) In order to avoid unnecessary procurement by the Project and PTTC, the requirement of reagents and other drugs, in the laboratory in particular, will be discussed.

h) The stock of semi-consumables, such as glassware will be checked to determine whether the quantity is sufficient. It will be confirmed together with CENAT whether further supply is needed or not.

i) Both equipment originally listed on the request form, and that additionally requested during the Basic Design Study site survey will be ranked as "A", "B" or "C". The study team will explain to CENAT that the final Equipment List will be prepared in consultation with persons involved in PTTC and with other experts in Japan.

j) With regard to the major equipment which has been categorized as "A" or "B", basic specifications for each item of equipment will be discussed and agreed using the documents previously prepared in Japan. Specifications for tender purposes will be prepared, based upon these preliminary basic specifications.

2-3-3 Basic Plan

(1) Site Layout Plan

The layout plan has been prepared on the basis of the existing condition (the environment, conditions of site, conditions of its environments): with due consideration of the result of site analysis and analysis of CENAT's existing facility structure as well as the points listed below.

1) An easy and safe approach from Road 95, in front of the premises, onto the site should be considered. The main gate with a security room is located at almost the same place as existing one. Entry/exit of vehicles should be limited to this main gate, while the sub gate is placed at the north-east corner of the site to keep a safe approach for out-patients coming on foot.

2) Although the hospital ward zone is not included in the Project, the new facilities should be arranged taking into consideration the relationship with the ward zone. Account must also be taken of the likely movement of patients, staff and services. The unification of the functions of new facilities by the Project and hospital ward should be considered, so as to make CENAT an integrated TB Center.

3) Within the new facility zone, the internal/external circulation lines of patients, staff and services should be simple and understandable. Both patients coming by car through the main gate and on foot through the sub gate will use the main entrance of the new building. Parking space for patients is located in front of the building close to the main entrance.

   Parking space for staff is located behind the buildings. CENAT staff should use the northwest entrance to the facility. Service access is provided on the south side of the facility to allow easy movement of materials and goods. A funeral car should access through the back gate near the mortuary on the north side of the site.

4) Several alternative plans (inner-court type, linear type, integrated type, and C shape type) were compared and evaluated in the process to determine the layout plan. The inner court plan has been adopted, because it makes more efficient use of the land than the other alternatives, and more natural light and ventilation will be provided. Parking spaces are arranged around the buildings, with the result that the inner court will retain a quiet and comfortable atmosphere and natural lighting and ventilation will be provided to the facilities.

5) Building orientation is considered in order to secure good ventilation and good sunlight throughout the year. According to the meteorological observation, the prevailing wind direction is from south to north. It may be desirable to have the 3

story buildings on both east and west sides and 2 story building on the north side in order to secure good ventilation of the building and natural light.

To protect the facility from the tropical sunshine and heavy rain, louvers and eaves will be considered.

6) As the Project site is located in a residential area behind Monyvon Street, which is the main street of the city, the environment and landscape around the site shall be considered. Therefore, three story buildings are planned. The building walls facing the eastern and western road are arranged keeping as much space as possible between the site border line and buildings. The northern (high school side) and southern (hospital ward side) façade of the building is divided into small elements so as to avoid any impression of a large barrier to surrounding zones.

7) As the M/Ds signed on 11th of April and 28th of July state that the City Transformer should be moved to an alternative suitable location, before the commencement of construction of the Project, the site layout plan is based on this principle. During the Draft Final Report Study, it was confirmed that relocation of the City Transformer will be carried out by WB Loan before the commencement of construction work.

8) The Cambodian side explained that the renovation of the canal at the western side boarder is to be implemented by an ADB project, however the implementation schedule is not clear. The site layout plan for the construction of the Project shall be formed in consideration of the fact that the canal improvement might not be completed before the completion of the building construction by the Project.

(2) Architectural Plan

1) Floor plan

The floor planning of the facility has been studied in consideration of the floor area required for each room, the function of each room and the site layout plan. Each floor plan was established based on the following criteria.

a) The design to accommodate the requested 9 divisions has been carried out considering rational zoning and layout, the function of each division and mutual circulation.

Zoning Plan has been studied with 8 zones, these being Out-patient, Clinical examination, Supply, Training, Research/Lab., Administration, Policy Making, and Ward zone, classified based on the 5 functions required by CENAT, such as Policy making, Training, Research and Examination, Supervision, and Treatment.

Circulation plan of patients, staff materials, etc. has been studied based on the classification into 6 categories of user of this facility, such as out-patients, trainees, staff, service, visitors and in-patients.

The first floor contains the Dispensary and X-ray unit. The circulation within the Dispensary unit is confined to this floor only. The staff and trainees zone on the second floor includes Research Laboratories, Training, Classrooms and Meeting room for training, education, and seminars, etc., which are used only by staff and trainees. The Pharmacy unit is located on the second floor in the front above the out-patients division. The program management office and other offices are placed on the third floor in an office zone which is separated from the areas of medical activity for TB control program on the floor below. The Program management office is at the front side of the 3rd floor, and the rooms for Accounting unit and Technical bureau are at the rear side.

b) The facilities related to research, training and laboratory examination which are the main functions of new CENAT should be planned based on careful study of the proposed training program and the proposed activities which the laboratory will undertake and the equipment required. The size and layout of equipment and furniture to be provided in each room shall also be taken into account for floor planning.

c) The unnecessary duplication of facilities (meeting rooms, libraries, toilets, etc.) must be avoided at the planning stage. These facilities must be integrated into the overall development, in order to establish the most reasonable facility plan.

d) An open corridor system enclosing an inner garden is adopted (instead of center corridor type) so as to maintain a comfortable environment in the rooms using natural light and ventilation and to reduce running costs. To provide ease and safety to the users of the facility, a composite layout of rooms, corridors, and entrance/exit surrounding an inner court has been arranged.

e) The building has been planned on a module concept to increase flexibility, reduce operating and managing cost, and rationalize construction. An economical 6m x 7m module will be adopted for the floor planning of the project.

f) The buildings must be accessible for patients arriving by wheel chair and patients with disabilities. Toilet room and approach ramp, etc., must be designed with these patients in mind.

g) Local material will be selected wherever possible considering maintenance and operation cost of the facilities after construction and the physical conditions of Cambodia. Furthermore, architectural and utility design should be easy

maintenance and have low running costs such as water and electricity fees as much as possible.

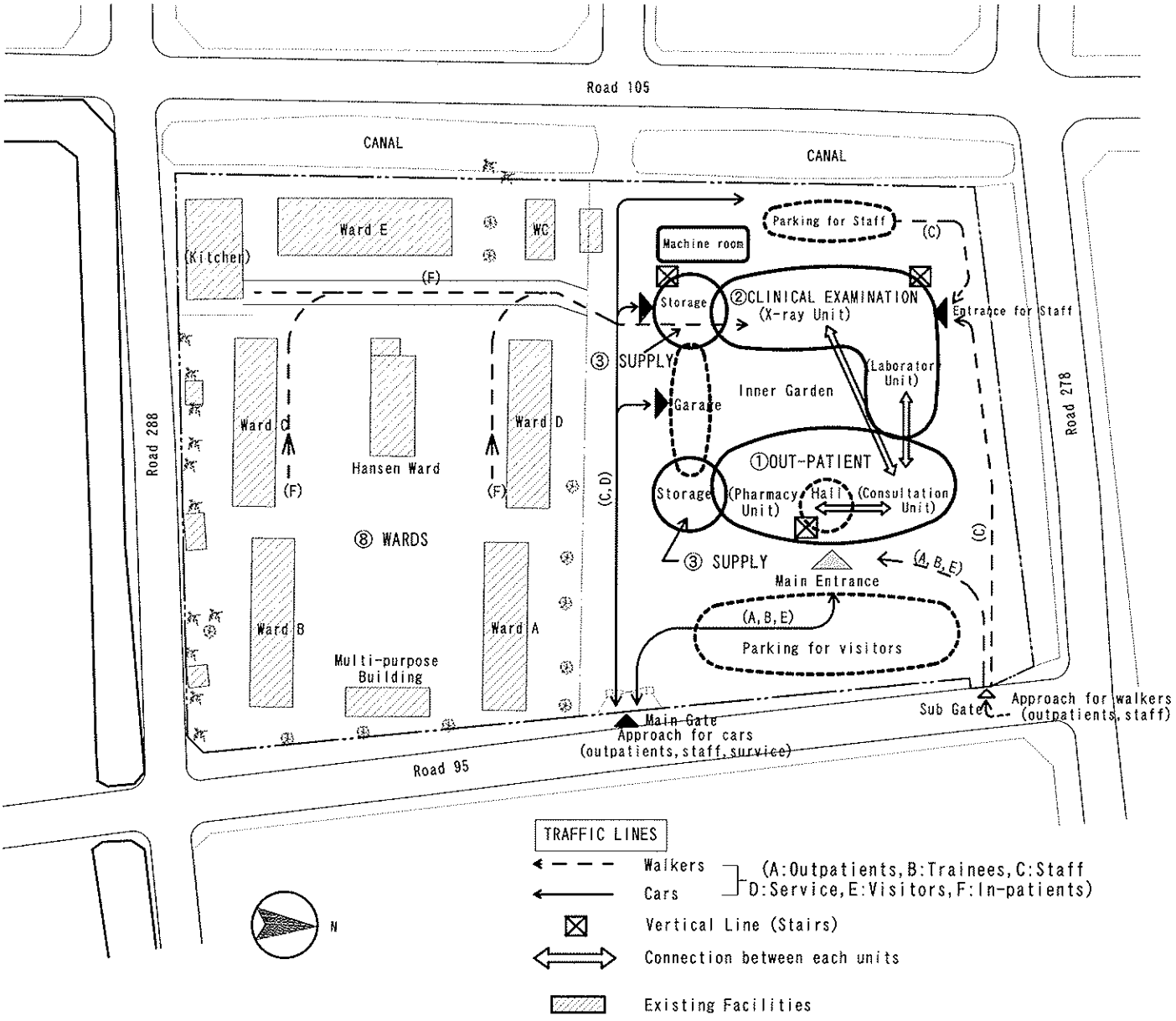


Fig. 2-3-11 Zoning and Circulation Line Plan – 1F

Functional Zoning and Facilities

Zone	Facilities	
① Outpatient	Dispensary Unit (Entrance, Reception, waiting lobby, Consultation room, Parking etc.), Pharmacy Unit (Distribution drug store), etc.	1F
② Clinical Examination	Laboratory Unit (Routine Lab –General, Sputum), X-ray Unit, etc.	1F
③ Supply	Pharmacy Unit (TB drug store, Medical material store), Laundry, storage, Machine room, etc.	1F, 2F
④ Training	Laboratory Unit (Microscopy training room), Meeting rooms, etc.	2F
⑤ Research/Lab	Function of National lab in Laboratory Unit (Research & Culture laboratory), etc.	2F
⑥ Administration	Program Management Office (Director room, Secretary room, Advisors room, etc.) Administration Office, Accounting Office, etc.	3F
⑦ Policy Making	Technical Office (Statistics & Planning room, Staff room), etc.	3F
⑧ Wards	Existing wards	South part of the site

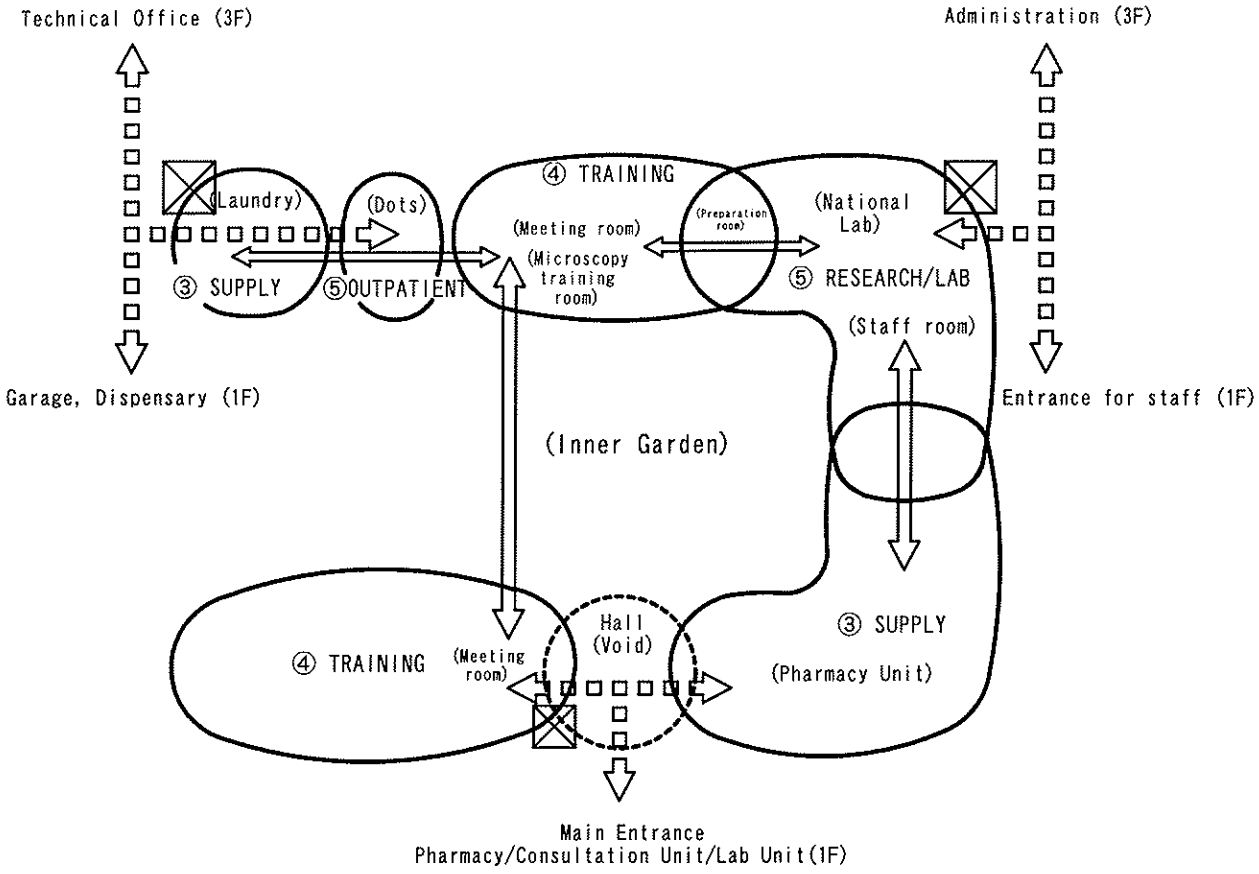


Fig. 2-3-12 Zoning and Circulation Line Plan－2F

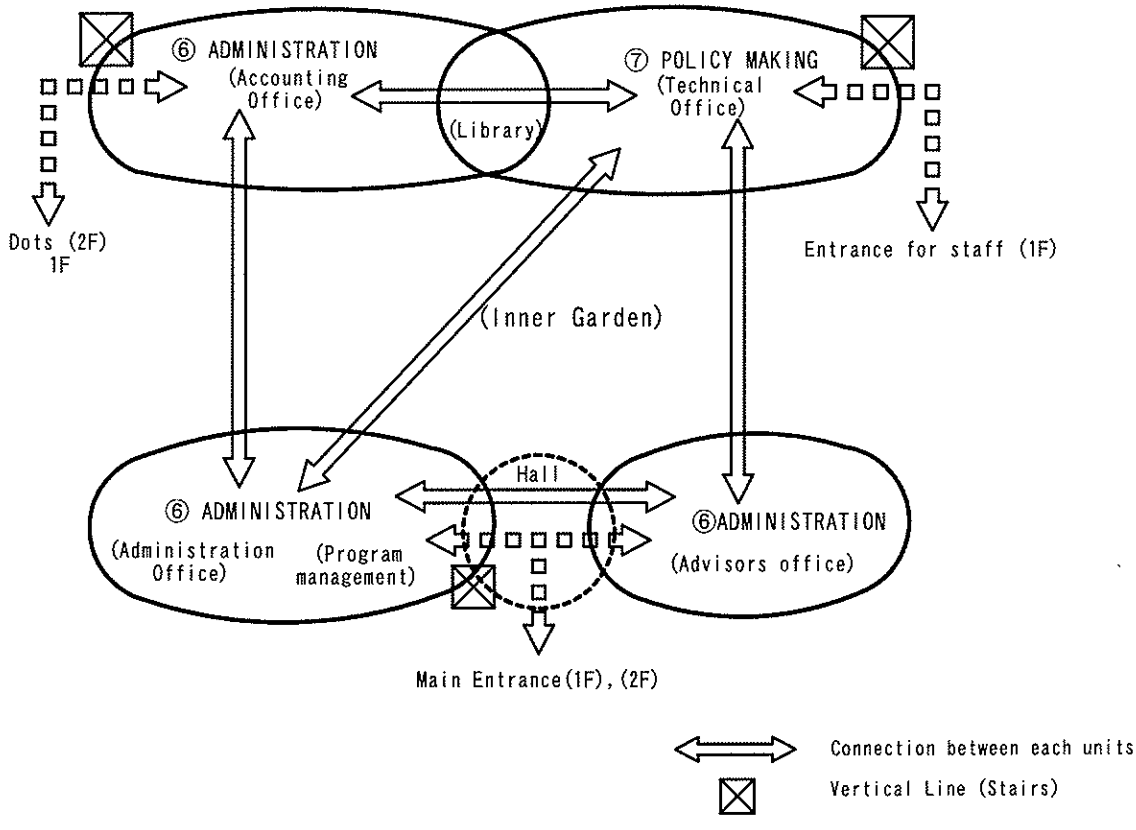


Fig. 2-3-13 Zoning and Circulation Line Plan－3F

2) Elevation and Cross-Section Plan

a) The level of site grading and 1st floor of the building shall be determined with consideration of both the possibility of flooding during the rainy season and the whole site condition of CENAT including the wards area. The bench mark close to the main gate is considered as the present GL (Ground Level) and a level 30cm above this is adopted as the Design GL (±0) for elevation and section plan. The 1st floor level is planned as GL +1,200 because of reasons mentioned above.

b) A 3 story building (including 1 story sections) should be considered so as to avoid a sense of oppression to surrounding residential areas, hospital wards, and high school as much as possible. Also, it may be necessary to locate the single story garage on the south side of the inner court and the 2 story building on the north side of the court in order to utilize natural ventilation to its maximum.

c) The roof will be sloped in order to quickly discharge the rain water.

d) The eaves will protrude, and Louvers will be installed to protect rooms from direct tropical sunlight and rainfall.

e) Ventilation block which allows sunlight and air to pass through is considered for use in the façade in order to protect the interior of the building from sunlight and rain water.

f) Wall surfaces will have openings as large as possible in order to enhance room ventilation and provide a balanced intake of sunlight. This will also reduce the running cost of equipment.

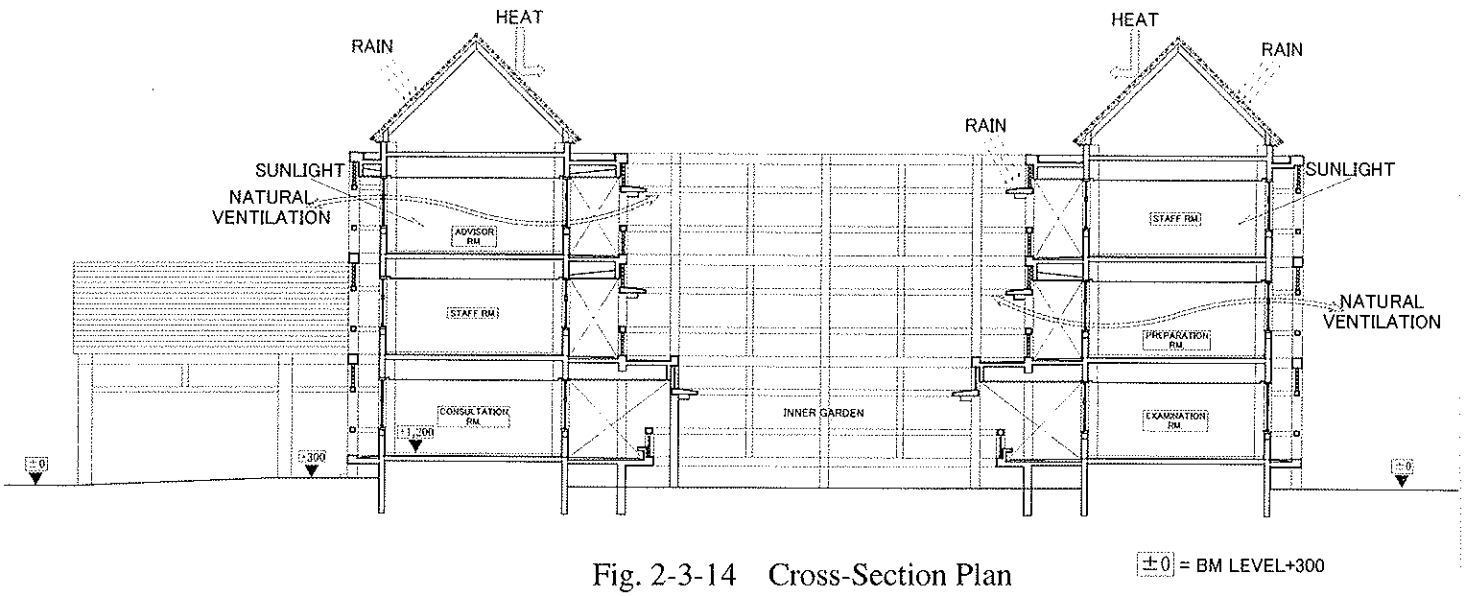


Fig. 2-3-14 Cross-Section Plan

3) Cost Reduction Measures

The various cost reduction factors which have to be considered in the course of design works for the CENAT buildings are as follows. The running costs and the maintenance costs must be taken into account.

a) It is advisable that planning is systematical based on a structural module. The modular coordination should consider size of rooms, and economical structure span.

b) Based on the result of review and investigation of planning and construction of the existing CENAT buildings, study on the cost versus benefit are to be considered in rational architectural planning for the Project.

c) The function of the whole facility must be considered so as to enhance the utilization rate of rooms and to promote the effective use of rooms, utilities and equipment.

d) Local construction materials should be effectively used so as to reduce not only the cost for construction but also the cost for maintenance. Finishing materials will be selected taking into consideration their anticipated life, and their maintenance characteristics, to reduce long term maintenance costs.

e) Consideration is to be given to the introduction of high energy efficient equipment and insulation material in order to reduce operation expenses.

f) Natural ventilation and lighting is to be used as much as possible. Mechanical ventilation and artificial lighting is to be minimized in order to reduce maintenance costs. However, some of the rooms will need mechanical systems. In this case, individual systems will be used in place of a central system.

g) As mentioned above, cost reduction measures are to be considered in the course of design works. Furthermore, reduction of the initial cost shall be considered carefully so as not to cause any cost increase in operation and maintenance and deterioration in quality.

4) Architectural Design Criteria

a) Architectural design should be studied after floor planning, sectional planning, and cost planning have been well considered, and after the function, durability, and economy of the building have been considered. It will be necessary to consider how much Cambodian building style can be reflected in the design and how the building can be harmonized with the surrounding buildings.

b) Traditional Cambodian design should not easily be adopted without consideration. Further studies of climate, culture and traditional architectural design is important to grasp the basic concept of how present the buildings using modern architecture, local materials and modern construction methods.

c) Since the form of roof and façade are important elements of architectural design, these shall be carefully developed in the design process. Consideration should be given to the fact that the Project is under Japan's Grant Aid, and the building design should not be too ostentatious.

(3) Structural Plan

1) Basic Policy

The structural design for the project should be formulated after a full review of the existing site conditions. In principle, the structure form should be designed to be without hindrance in use in consideration of the deflection in the long-term load, the vibration, and so on. And, it is should be to have satisfactory safety at the time of the short-term load as for (the earthquake and the wind load) as well without spoiling the strength of the building.

2) Standard for Structure Design

Regulations related to buildings are in the process of preparation, and they have not being carried out in "Cambodia" yet. In this study, the structural calculation is to be based on the Architectural Institute of Japan, and the standard of material and the test are to be based on ASTM. The foundation shall be designed in consideration of the result of full examination of geological investigation.

3) Methods and Material

Superstructure is to be Rigid Frame Structure with Earthquake Resisting Wall, and the walls are to be made by brick. And, a steel structure frame is to be used partly for the roof. As for the concrete, it is possible to get Ready Mixed Concrete from a central batching plant in the city, and the quality and quantity of their supply is satisfactory. Reinforcing steel bars, structural steel will be procured from the third countries, and bricks are available to get both of the Cambodian product and the Vietnamese product.

Foundation : Driven pile (pre-cast concrete pile)

Concrete : Design strength (fc) = 21 N/mm^2

(28 days compressive strength of cylinder test piece)

Reinforcement : SD295A(D10～D16), SD345(D19～D25)

Steel : SS400 (section steel, steel plate), SSC400(light gauge steel)

Steel structure is adopted in consideration of the durability and so on though a roof can be thought Timber Structure or Steel Structure.

4) Geological condition and Foundation

The results of the soil investigations indicate that the layers from ground level to a depth of 0.5 meters are soft and weak clay which is mixed with bricks. The silt quality clay layer is distributed, and GL-0.5～8.0m are N value =8 - about 10 on the average of the thing that there is dispersion a little in the N value. The layers from 0.5 meters to approximately 3.5 - 4.0 meters are weak clay with unconfined compression strength of approximately 3.40 kN/m^2. There is a layer which partly contains a block as the clay layer subject, and L-8.0～14.8m is smaller in the N value =2 - about 11 than an upper clay layer. GL-14.8～19.0m are N value =2 - about 19 in the sand quality clay layer, and a hard sand quality clay layer is distributed as for GL-19.0m～ of the N value =25 and more. The numerical value of unconfined compression test in silt quality clay layer is very small when N value is compared with the numerical value (3.40kn/m2) of unconfined compression test in silt quality clay layer around GL-3.45～3.90. Foundation is directly unacceptable as the geology conditions because very frail tri-axial compression test value is small, and there is much dispersion though the N value of silt quality clay layer is high.

As for the foundation of this case, it must go through the stratum (a stratum with the possibility that consolidation settlement) which contains a block as the above investigation result. It can think that the pile foundation which moves GL-16.0m～19.0m (more than N value 25) to the support layer is suitable in structure safety. Tentative proposal is to use reinforced concrete square pile, size 350mm x 350mm and 400mm x 400mm

Based on the result of the soil investigation, safety and economical materials should be selected.

5) Design Load

a) Dead Load : In order to keep the comfortable space, the dead load is calculated in consideration of the special thickness of wall and slab as well as the structural member and finish materials in the X-ray room.

b) Live Load : There is no standard for line load in Cambodia. Design condition of live load will be setup based on the weight of the furniture, medical equipment, machines for facilities.

c) Seismic Load : In Cambodia, earthquake's occurrence is very little frequency. As a result of careful consideration to the safety building and the characteristics and referring to the facilities from the examples, such as MCH and other Grant Aid Project, or building in Thailand, the base shear coefficient can be reduced to 50% of the appropriate value(Co=0.1) in the Building Standard Law of Japan.

d) Wind Load : Comparing with Japan, a influences of the typhoon is little. According to the instruction by the Department of Urbanization and Construction, Municipality of Phnom Penh, the wind load is approximately 25 kgf/m^2 in Phnom Penh. Heavy winds which cause significant impact on the buildings are not recorded around the project site.

(4) Utility Plan

It should first be remembered that this facility is for CENAT. Facility planning and equipment planning should be coordinated so that each facility, (such as laboratory division, out-patient, pharmacy division, and administration division), can be operated effectively. Consideration should be given to the condition of existing infrastructure (electric power, telephone, water supply and drainage etc.). Operation and maintenance system costs need to be considered

1) Basic Concept

a) The following items need to be considered for the utility plan.

i) In the process of conducting experiments and during consultation with patients, some dangerous medical waste material is produced. An appropriate waste disposal system is an important factor.

ii) Building planning should consider the number of persons using the facility based on the training curriculum. It is important that the training laboratory reviews the experiments which are likely to be conducted. These can then be coordinated with facility and equipment planning for effective use of facilities.

iii) As there will be a lot of medical equipment, consideration should be given to the consistency and/or interface with facility and equipment plans and problems with piping and electric distribution.

b) In order to clarify the scope of the work to be borne by the Japanese and Cambodian project participants, the facility plan should be prepared so that existing facilities at the Project site are not affected. New facilities for the project should be independent from the existing. In addition, the function of existing facilities and new facilities to be built by the Project should be clarified. New facilities should function together with existing facilities.

c) From the view point of easy procurement of spare parts, easy facility maintenance and repair, and easy facility operation and management, equipment and materials for the Project should be locally standardized products.

d) The codes and standards used for materials, design, etc., should basically be relevant Cambodian codes and standards. If there are no applicable codes and standards in Cambodia, other internationally recognized codes and standards should be applied.

e) In Phnom Penh city, air conditioners are necessary because of the high temperature and humidity. However, the minimum number of air conditioners should be provided in computer rooms and analytical equipment room in order to maintain the room temperature as required. Rooms should have sufficient openings to provide natural ventilation, so that air conditioners can be shut down when appropriate and the building running costs can be minimized

f) As low utility costs are very important for facility maintenance and operation, the facility plan should take into consideration energy saving measures.

2) Electrical Works

a) Power and Transformer Facilities

A medium voltage line (3 phase, 3 wires, 15kv, 50Hz) located along the road (Road 95) has been extended to an existing Substation (Transformer: 630KVA). This will provide the power source for the new facility.

According to the series of discussions with CENAT and the Public Electric Power Authority (EDC:Electricitè du Cambodge) in Cambodia, the existing Substation can be relocated to within the site. It has been confirmed that rehabilitation of the H.T. Receiving Panel, expansion of the transformer in the existing substation and distribution and extension works (as stated in the Minutes of Discussion) should be carried out by the Cambodian project participants. A new electrical room should be located next to the new facility in order to avoid unnecessary cabling and to allow easy access.

Power supply conditions in Cambodia should have been improved owing to a recent power station project. However, according to CENAT, the power

supply condition has not yet improved. Both power failures and voltage fluctuation sometimes occur. Stabilizers are to be provided for the computer room.

The estimated power demand is approximately 170kw as following calculation:

Contents	Load density w/m^2	Building area m^2	Total load kw	Demand factor %	Demand kw
Lighting, Electrical Outlets	30	3,100	93	50	46.5
Air Conditioning	—	—	63.6	100	63.6
Pump	—	—	30.35	20	6.07
(sub-total-1)			(186.95)		(116.17)
X-ray	—	—	50	100	50
(sub-total-2)			(50)		(50)
Total			236.95		166.17

Thus, the estimated power demand is approximately 170kw.

b) Generator and Main Feed Wiring

No power failures were experienced during the B/D Survey period but according to CENAT, power failures occur occasionally during the rainy season. However, the existing generator was operating so power cuts did not cause a particular problem. An emergency generator should be provided for the new facility and consideration should be given to maintain minimum loading for operation of building utilities and for security. Operational hours of a generator are considered to be 10 hours per day,

Outline capacity of the main emergency generator is approximately 150KVA as follows.

[Sub-total road(186.95kw) - Sub generator model (20kw)] x 50% ≒ 83kw

83kw + X-ray Load (50kw) = 133kw

133kw x 1/0.85 ≒ 150KVA

According to the above calculation, a generator with a capacity of at least 150KVA is required. A diesel engine is more economical, and easily maintained. Reliable equipment should be selected.

The main emergency generator should be stopped at night (17:00 – 07:30) in order to economize on fuel. In order to do this, an additional generator (capacity; 25KVA) for laboratory equipment (Incubator, Pharmaceutical Refrigerator, Refrigerator, Deep Freezer) should be installed to stand by for 24 hours.

The generators are to be used as follows.

- Main emergency generator 150KVA-type: 7:30~17:00 (is standing by for 9 hours)

- Sub-emergency generator 25KVA-type: 7:30~7:30 (is standing by for 24 hours)

The main feed wiring system from the L.V. Receiving Panel should be 3-stage, 4-wire 220/380V 50 Hz, and systematized giving consideration to loading and supply. Main feed wiring capacity should be adequate for the equipment to be connected. Wiring method should be basically a cable truck system in shafts and for other locations wiring should be piping system.

c) Lighting Fixtures and Outlets

Existing facilities have large openings, so during the daytime almost no lighting is used in the laboratories. However, the lighting level was found to be relatively low, which is not an ideal condition. Furthermore, during the rainy season, each room is even darker. A minimum lighting level should be maintained in order not to affect medical research and training.

The lighting level for each room is established as follows, based on the mean "JIS" standard lighting level and taking CENAT's requirements into consideration. For laboratories in particular, an efficient lighting layout is required, using local switch circuits, in order that the electrical running cost can be reduced.

Lighting Level / Room	JIS Standard Lighting Level	CENAT Proposed Lighting Level	Design Lighting Level Lx
Consultation rooms	750~300	300	300
Meeting room	750~300	300	300
Laboratory	750~300	300	500
Computer Room	650~400	400	400
Library	750~300	300	300
X-ray	200~100	300	100
Office	750~300	300	200
Large meeting room	750~300	300	300
WC	150~75	-	75
Corridor	100~50	-	50
Storage	200~100	-	50

Security lighting has been considered since expensive equipment is to be installed in the new facility. It is proposed that mercury lighting fixtures are to be provided at the entrance and around the buildings.

In Cambodia, sunrise and sunset times are constant throughout the year. Whilst no automatic switches for the lighting should be required, timer switches are necessary.

Grounding-type power outlets in the laboratory are to be 16 A.

d) Telephone System

According to the series of discussions with Ministry of Posts and Telecommunication (MPTC) in Cambodia, main telephone lines are installed along Road 105 behind CENAT. Connections can be made at any time upon request. Cabling works/wiring and piping works from the existing main link transmitter to Point Distribution at the site should be the undertaking of the Cambodian project participant.

Supply and installation of new MDF/PABX, Cabling works/Wiring and Piping works from Point Distribution to new MDF/PABX should be the scope of the Japan project participant.

In Cambodia, the cost per one circuit is quite high. In order to utilize a small number of circuits and to minimize the maintenance, the introduction of a PABX should be considered as being the most appropriate telephone system. The proposed number of telephone circuits and the rooms where telephones are to be installed are as follows:

Extension Lines Connected to PABX

Rooms and No. of Telephones to be Installed

1F:	- Laboratory	
	- X-ray staff room	
	- Pharmacy	
	- Reception room	
	- TB drug distribution	
	- Dispensary staff room	
	- Security room	
2F:	- Meeting room	
	- Classroom 3	
	- Laboratory staff room	
	- Research laboratory	
	- Pharmacy office	
	- Home care DOTS office	
3F:	- Director's office	
	- Vice Director's room	
	- JICA expert office	
	- Advisors office	
	- Administration office	
	- Accounting office	
	- Technical office	
	- Statistics & Planning room	
	- Library	Total: 22 lines

Among the above 22 telephone lines, telephones at the following locations should be able to make and receive external calls as well as internal calls. Remaining telephones should be set for internal call use only.

- Secretary's room
- Advisors office
- Technical office

e) Public Announcement System

A public address system is to be provided for communication. The proposal is as follows.

i) Classroom 1, 2: speakers and microphone systems are to be provided for seminar and lecturing purposes.
ii) Waiting lobby: speakers and microphone systems are to be provided for announcements to outpatients.
(1F Consultation room 1, 2, 3, 1F Reception room, 1F X-ray staff room, 1F X-ray operation room, 1F TB drug distribution room)
iii) Blood room: Buzzer is to be provided for notice to outpatients
iv) X-ray operation room: speakers and microphone systems are to be provided for instructions to outpatients.

f) Fire Alarm System

The fire alarm system will be designed according to the Japanese regulations under the guidance of Municipal Police Fire Service. Fire hydrant box equipped with bells, red lights and buttons should be installed at areas only where there is danger of a fire. Boards (with bell, light and buttons) should be installed at the locations where a fire hydrant box is not installed. The fire alarm board (receiver) should be installed in the security guards room and the administration office.

Fire alarm board should be equipped with battery and battery charger (30 minutes assured), to ensure operation during periods of power failure

g) Lightning Protection System

It was requested by CENAT that a lightning protection system should be provided to protect the whole building, because there would be many lightning strikes during the rainy season.

4) Water Supply and Sewerage System

a) Water Supply Systems

Connections from the main pipe to a water supply meter at the site boundary should be the undertaking of PPWAS. Piping from water meter to the new water reservoir, and further piping and connections should be carried out by the Japan project participant.

From 6:00 am to 8:00 pm, the water supply pressure of the main pipe, which is supplied from the city water supply plant, is 10 kg/cm^2 or more at the end of the piping network. After 8:00 pm, the city water pressure drops constantly. Therefore the capacity of the reservoir and elevated tank will be sufficient to cope with a shortage of water. The capacity of the receiving tank and elevated water tank shall be in accordance with water consumption for one day.

After discussions with MCH and CENAT, it was determined that the quality of the water supply is satisfactory, and therefore it will not be necessary to provide filtration equipment.

An elevated water tank is to be provided in order that sufficient water pressure can be maintained in all rooms within the facility. As the above system has few pumps, it will be easy to maintain.

The water reservoir tank should be the above ground type. Both the water reservoir tank and elevated water tank should be of the 2-tank type. Piping materials should be polyvinyl chloride pipe PVC which is strong, low cost, and easy to install.

i) Water Consumption

Based on number of persons and each room's operational rate (as stated in 2-3-2), the number of persons using the facility is calculated as follows:

- Staff (Medical staff, other staff): 200 persons (planned for the the year 2001)
- Out-patient(Lab., X-ray):106 persons(planned for the the year 2001)
- Seminar: (Classroom 1, 2 117 persons + Classroom 3 32 persons) x 0.8 (active factor) = 120 persons

As such,

- Staff: 200persons/day x 110 ltr/day/person = 22,000 ltr./day
- Out-patient: 115 locations x 10ltr./day/location = 1,150ltr./day
- Seminar: 120 persons x 30ltr./day = 3,600ltr./day

Total: 26,750 ltr./day → 30 m^3/day

Thus, the daily water consumption is approximately 30m^3/day

ii) Capacity of Water Reservoir

Daily Water Consumption : 30 m^3/day
Storing 50% of Flushing Water Consumption : 30 m^3 x 0.5 = 15 m^3
→ (under ground type concrete water reservoir)

Storing 50% of Tap Water Consumption : 30 m^3 x 0.5 = 15 m^3
→ (2m x 3m x 2.5 mH, FRP)

Capacity of Water Reservoir for Fire Fighting: 20m^3
(underground type concrete water reservoir)

iii) Elevated Water Tank

Elevated water tank should have a capacity of 10% of daily water consumption.
15 m^3 x 10% = 1.5 m^3 → 2.0 m^3 (water tank made of SUS) x 2 tanks

iv) Pump

If running time per day is 10 hours:
Average water supply quantity per hour: 15m^3 ÷ 10 hrs = 1.5 m^3 /hr
Maximum water supply quantity per hour: 1.5m^3/hr x 2 = 3.0 m^3/hr
Momentary maximum water supply quantity: 1.5 m^3/hr x 3 = 4.5 m^3/hr → 75 ltr/min
Capacity of pump: 75 ltr/min x 2 pumps(automatic alternate operation)
x 2 nos.

b) Fire Fighting Facility (including fire extinguishers)

The fire hydrant and fire extinguisher will be designed according to the Japanese regulations under the guidance of Municipal Police Fire Service.

The fire hydrant and fire extinguisher should be provided for immediate fire danger, so that people can be quickly evacuated from the buildings and fire fighting action can promptly be taken.

c) Sewerage System

As no public sewage lines are provided around CENAT, sewage water is currently disposed of to a septic tank and absorbed in the ground. In the rainy season, it is anticipated that the capacity of ground absorption becomes lower due to rising of the ground water level, and pollution of the ground surface is possible. Therefore, a septic tank should be planned and the water therefrom should be disposed of into the river. Environmental effects to the surrounding area must be considered. As Cambodian regulations are becoming more strict, the septic tank is planned to be of a combined treatment system and output

should be less than BOD 60 ppm because water is finally discharged to the river in accordance with the guidance of the Department of Pollution Control Division, Ministry of Environment.

Chemical waste water includes waste water from experiments, water used to wash equipment and cooling water. As for heavy waste water and waste water from experiments using acid, alkaline and organic solvent, these should be collected first in a tank/bottle, and after that diluted by adding to second stage wash water, and transferred to a neutralization tank (tank structure and neutralization system by mechanical works). The treated water will then be discharged to the external canal. As a result of the tests of waste water from laboratories, it was confirmed that there is no risk of water pollution by toxic chemicals or heavy metals. Therefore, by prohibiting direct disposal of heavy waste water, the above mentioned system shall be adopted instead of using a special waste water treatment system.

As mentioned above, it is necessary to establish a total operation system in order to achieve environmental protection by a proper trash disposal system as well as waste water disposal system. It is also important to meet the requirements of future environmental protection systems to be introduced in Cambodia.

d) Sanitary Equipment

Local type water closets are mainly used in the existing facilities. According to the request by CENAT, water closets should be a combination of local and western types considering Cambodian lifestyle and hygienic view points.

(1F):	Toilet for outpatients	:	all of water closets are local type
	Toilet for staff	:	a combination of local and western types (*)
(2F)	Toilet	:	a combination of local and western types (*)
(3F)	Toilet	:	a combination of local and western types (*)

(*): If number of water closets is three, one shall be local type, two shall be western type.

According to CENAT, it was proposed that washing showers were required in each booth for reason of hygiene and convenience. Since sanitary equipment is locally available, maintenance including procurement of spare parts would be easy.

e) Air Conditioning A/C and Ventilation System

Rooms should, wherever possible have sufficient openings to provide natural ventilation so that air conditioners can be shut down when appropriate and the building running costs can be minimized

The minimum number of air conditioners should be provided in each room in order to maintain the room temperature as required.

The rooms where air conditioners are to be provided are as follows:

Room	Nos.	Capacity (Kw)	Remark
(Program Management Office)			
- Director's office (including Secretary)	1	3.0	The existing room has an air conditioner
- Vice Director's office	1	2.2	ditto
- JICA expert office	1	2.2	ditto
- Advisors office	1	2.2	ditto
- Reception room	1	1.7	ditto
(Technical Office)			
- Statistics & Planning room	1	2.2	To protect computers
- Meeting room (Medium, Multi-Purpose)	1	3.0	To raise efficiency of training
- Classroom 3	1	1.7	To raise efficiency of training
- Library	2	2.2 x 2	To raise efficiency of training and to keep books in low humidity
(Laboratory)			
- Smear examination laboratory	2	2.2 x 2	To maintain appropriate conditions for testing/examination
- Laboratory	2	2.2 x 2	To maintain appropriate conditions for testing/examination
- Research laboratory	2	2.2 x 2	To maintain appropriate conditions for testing/examination
- Sterilization room	1	2.2	To maintain appropriate conditions for testing/examination
- Reagent preparation room	1	2.2	To maintain appropriate conditions for testing/examination
- Training laboratory	2	2.2 x 2	To maintain appropriate conditions for testing/examination
(X-ray)			
- X-ray room	1	3.0	To maintain radiation shielding
- Dark room	1	1.7	To develop and print X-ray film
- Operation room	1	1.7	To take appropriate operation
(Pharmacy)			
- Drug storage	1	2.2	To maintain a quality control of medicine
(Outpatient)			
- Pharmacy	1	2.2	To maintain a quality control of medicine
(Others)			
- Classroom 1, 2	2	3 x 2	To raise efficiency of training
Total(Rough Estimate)		63.6	

As for the ventilation, the basic policy should be to use natural ventilation. However, a mechanical ventilation system is considered for the Dark Room, Lavatory, Staining Room, Examination Room, Preparation (sterilization), Electrical Rooms, Diesel Generator Room and Pump Room.

A ceiling fan with bracket is to be provided in rooms where an air conditioner is not provided. In addition a sleeve and power outlet are to be provided for future installation of an air conditioner.

f) Garbage and Chemical Waste Disposal

The garbage is collected from a garbage can by "Garbage Collecting Private Company, PSBK" truck. There is an existing incinerator for ordinary garbage. Therefore, after study, the incinerator for the medical facility will be designed at the project site according to the guidance under Department of Pollution Control Division, Ministry of Environment,

g) Propane Gas System

The gas supply should be a central supply system. 50kg cylinders, which are easily available, should be selected and located in the gas cylinder room where such cylinders can be changed easily.

1F: Smear examination laboratory, Laboratory
2F: Research laboratory, Training laboratory

(5) Equipment Plan

1) Preparation of Equipment List

In consideration of PTTC activity which has started in August 1999, during the site survey, the items of equipment that are being requested were classified as category "A" with the highest priority, "B" with intermediate priority/further study needed or "C" with the lowest priority. The quantity of requested equipment was also discussed.

In addition, each item of existing equipment has also been classified as category "A", "B", or "C", on the basis of its present condition, "A" being "working well" and "C" being "not working and/or not repairable".

Subsequent to preparation of the equipment request form some circumstances have changed bringing about a need for some additional equipment. Furthermore, during the basic design study site survey further items of equipment were identified as being necessary. These additional items of equipment have been added to the Equipment List.

On the Equipment List the specifications and number of laboratory tables and chairs are indicated as "to be decided based on the laboratory planning", since further basic design study is needed in order to decide specifications and quantity.

Subsequent to signature of the Minutes of Discussion by the Governments of both Cambodia and Japan some additional equipment was requested and added to the Equipment List. Most of this additional equipment was ranked as category "B". Further discussion regarding this equipment would take place in Japan.

During the analysis and discussion in Japan at which some experts in TB control and treatment were present, all equipment ranked as "B" category was reclassified to either "A" or "C" category.

A final Equipment List was prepared based on the list of equipment requested by CENAT and opinions and comments from Japanese experts of TB control. The final Equipment List together with brief specifications of each equipment were explained and their consent was given.

2) Condition of Existing Equipment

Most of the equipment which is presently in use is in a serviceable working condition. In addition there is some new equipment which has been donated through Japanese Grant Aid, French Grant Aid, other foreign aid projects and/or purchased with World Bank loans. Some of this equipment has been kept in the storage and therefore in "as new" condition.

At the time of the site survey the information regarding the working conditions of existing equipment was found to be old and not reflecting the current situation. Therefore, the working condition of existing equipment was investigated. This current information was used as a basis for prioritization of the equipment that has been requested.

3) Discussion of Basic Specifications

Preliminary Basic Specifications for major items of equipment (incubator, X-ray diagnostic equipment, photocopier etc.) were prepared in Japan, prior to the basic design study site survey. During the basic design study site survey the proposed specifications were discussed with the CENAT representatives. The results of this discussion are summarized below.

Department	Item name	Q'ty	Basic Specifications
Adminis-tration.	Typewriter, Khmer	1	Preparation of Official Documents for MOH etc. Manual Typewriter
Dispen-sary.	TV set	1	Education on TB control for patients and their family Reproduction of PAL and NTSC tapes
Laboratory	Incubator	1	Culture test of tubercle bacillus Capacity: approx. 1000L required from number of test tubes to be cultured
Laboratory	Deep Freezer	1	Preservation of tubercle bacillus strain No need of ultra low temperature Capacity: approx. 200L
Laboratory	Distilling Apparatus	2	Preparation of staining reagents for distribution to peripheral medical facilities Barnstead type Production capacity: more than 6 L/H
Laboratory	Safety Cabinet	2	Training of anti-TB professionals Installed in Preparation room Protection of trainees against infection
Program Management office	Photocopier	1	Material production for meetings Copy size up to A3 With Sorting function
Technical Office	Video Cassette camera	1	Preparation of training and education materials Regular size cassette preferred
Technical Office	Computer set	3	Statistic data processing etc for TB control Desk-top type With printer, other peripherals, software etc.
Technical Office	Projector for Computer	1	Presentation purposes at meeting rooms LCD projector for personal computers
Technical Office	Printing Machine	1	Production of CENAT quarterly reports and training materials Simplified printing machine to reduce production cost
Technical Office	Object Projector	1	Presentation purposes in meeting rooms Projection device for object including books
X-ray	Drying & Developing Machine	1	For the purpose of developing, fixing and drying X-ray films Desk-top type, automatic developing and drying machine
X-ray	X-ray Unit with Bucky Table	1	For diagnostic purposes of TB patients With Bucky table and Bucky stand

4) Diagnostic Equipment

There are several items of equipment on the requested Equipment List which appear to be neither directly related to the TB control activities nor appropriate to grant aid objectives.

These items of equipment were prioritized as category "B" at the time of the site survey, and were studied together with experts in TB control and with persons to be involved in the Project-type Technical Cooperation. The results of investigation in Cambodia and the decision reached in Japan are as follows. These documents were explained to CENET, and their consent was given.

a) Ultrasound Diagnostic Equipment

CENAT explained that ultrasound diagnostic equipment is of particular use for:

i) Detection of pleural effusion and drainage
ii) Detection of Extra-pulmonary TB such as kidney
iii) Differentiation of ascites

CENAT also explained that this imaging modality is beneficial because it is less expensive and has higher detection capability of lesions than X-ray diagnosis.

Furthermore, it is said that Dr. Satha, the Chief Radiologist of the X-ray Unit at CENAT, had training for examination and diagnosis using ultrasound equipment.

Running cost will increase slightly due to the introduction of this device because some consumables such as jelly and recording paper will be required.

The number of patients who initially have use of this equipment may be limited, but this modality can become an important means of income when patients are accepted from private clinics. The examination fee at private clinics presently is approximately 20,000 riels.

After further discussion in Japan it was decided, however, to lower the priority of this modality since ultrasound diagnostic equipment is not essential for anti-TB activities, even though this equipment has proven to be useful in certain fields of anti-TB activity. If the Project-type Technical Cooperation, which is to be commenced in August 1999, reveals the need for this equipment, the possibility of acquiring the equipment through the PTTC project will be studied.

b) Bronchofiberscope

CENAT has been performing bronchoscopic examination using a secondhand broncofiberscope donated by a French NGO. They plan to continue carrying out this examination. Biopsy samples are presently sent to hospitals in Phnom Penh for analysis and diagnosis of TB.

The Equipment List includes a bronchofiberscope as well as various kinds of related peripheral devices. The study in Japan initially considered giving a high priority to the main unit and power source. However it was eventually concluded that this equipment should be excluded from the Project because it is not essential equipment for anti-TB activities.

c) Mobile X-ray Diagnostic Unit

This equipment will mostly be used to take X-ray images of seriously ill TB patients who are resident in the patient ward. Until such time as the patient ward is renovated the equipment would be stored in one of the X-ray Department rooms. There will be difficulties moving the equipment from the X-ray Department to the patient ward, particularly in rainy seasons.

Renovation of patient ward is out of the scope of the Project. There is however a plan to renovate the patient ward and to put the outside of the buildings into good condition using a World Bank loan. This plan has yet to be finalized. Since the Project plans to donate X-ray equipment with Bucky table and Bucky stand, and since the frequency of use of mobile type equipment is likely to be low, this equipment is excluded from the Project.

5) Computers for Data Processing

Several personal computers have been in use at CENAT for evaluation of TB control activities, and for preparation of various kinds of reports. One of the regular and important tasks at CENAT is to collect statistical material from peripheral medical facilities (such as the new incidence rate and cure rate of TB), and to compile a quarterly report. Medical doctors and other medical staff therefore know how to handle and use computers efficiently.

There may however be some risks in the local procurement of computers. Computer hardware supplied by most major manufacturers is, on the face of it available, but it is rumored that in some instances the original PC boards have been replaced with poor quality PC boards. Procurement should therefore be made from reliable agents or distributors.

Furthermore, even though the products are generally provided with free 3-year guarantee, after-sales service is often not satisfactory. Again, reliable agents or dealers with proven after-sale service capability should be selected.

CENAT presently use MS Excel for statistical processing of TB control data. For this purpose, and for the creation of various kinds of report, MS Office, Photoshop and some other software is required.

Attention should be paid to the fact that illegally copied software is sometimes preinstalled onto new computers which are then sold without software floppy disks or CD-ROMs.

The Internet is becoming popular and three internet providers have started business. E-mail capability, including MODEM and software, is essential for communication between CENAT and outside organizations such as WHO.

6) Voltage Fluctuation and Measured Results

According to Electricite Du Cambodge (EDC), the governmental power supply organization, there is no measured data available concerning the quality of electricity (e.g. voltage fluctuation and frequency fluctuation) supplied by them.

EDC also explained that at present the power supply is cut off two to three times a day due to circumstances beyond their control. They claim that the frequency of failure will be reduced to two to three times a month by the year 2000 since improvement of cables and transformers are under way.

During the site survey, the power supply was cut off several times. Generators are essential for private use. Many private houses are equipped with generators for their own use.

Voltage fluctuation data is shown below. The voltage fluctuation which was measured every one second and every 20 seconds without voltage stabilizer shows that the average voltage was about seven volts higher than the nominal 220 volts. Whilst a voltage surge of seven volts has been measured, it is likely that the actual surge may be somewhat higher than the measured value. This voltage surge may affect the function of equipment.

	Av. Volt (V)	Max. Volt (V)	Min. Volt (V)	Difference (Vp-p)
1 sec measure	225.9	229.6	224.0	5.6
1 sec measure (w/ stabilizer)	218.6	221.0	216.9	4.1
Volt difference	7.3	8.6	7.1	1.5

	Av. Volt (V)	Max. Volt (V)	Min. Volt (V)	Difference (Vp-p)
20 sec measure	226.0	229.9	223.2	6.7
20 sec measure (w/stabilizer)	218.6	220.9	215.8	5.1
Volt difference	7.4	9.0	7.4	1.6

Measured at Lab Unit, CENAT

Some major equipment and computers will therefore require voltage stabilizers and/or UPSs (uninterrupted power supply) respectively. The specifications should be written accordingly.

Working Conditions of Exisiting Equipment at CENAT

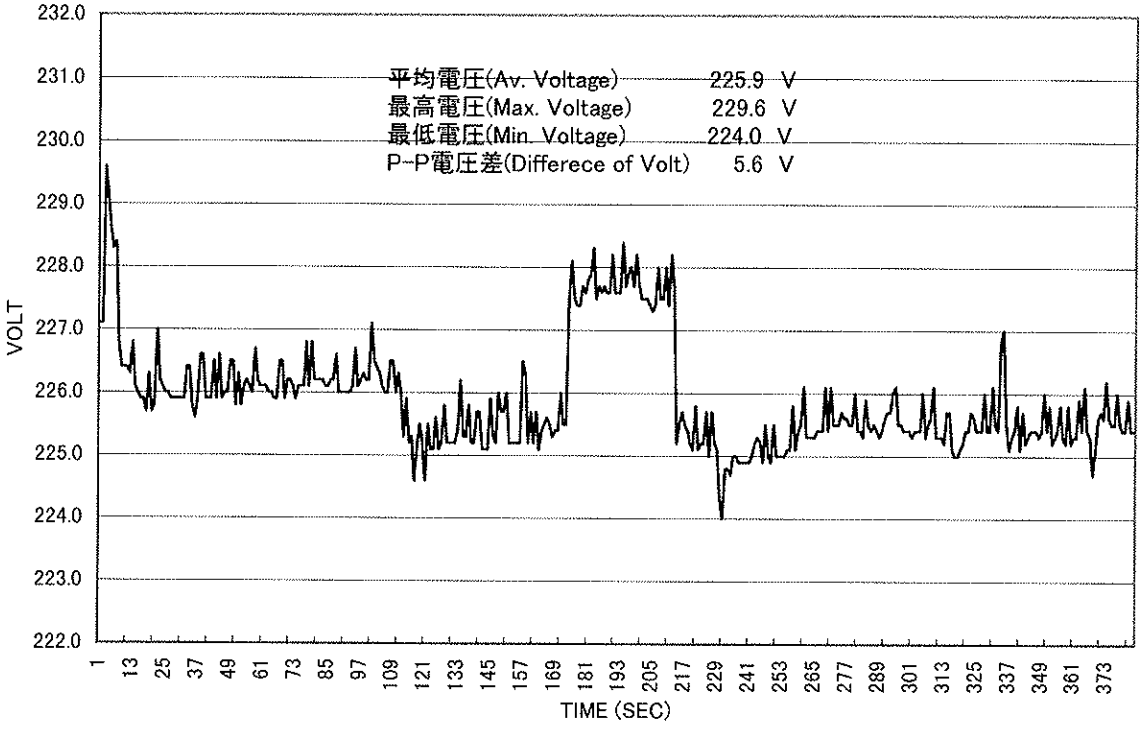
As of April 26, 1999

Name	Manufacturer	Model	Date Purchased	Q'ty	Reported Condition	Revised		
						A	B	C
Example:X-ray apparatus	ABC Corp	XYZ	May '91	3	A	1	0	2
X-ray apparatus	Acoma x-ray	KXR-5-150KV	1993	1	A	1		
Lead plywood	Nishimoto	NIL	1993	1	A	1		
X-ray protective aprons	Miwa	MA-2	1993	2	A	2		
X-ray protective screen	Miwa	MA-2	1993	1	A	1		
Accessories for dark room	Nishimoto	NH-7	1993	1	A	1		
Small sterilizer	Sakura	ASV-3022	1993	2	A	2		
Hematocrit centrifuge	Kubota	3100	1993	1	A	1		
Refractometer	Atago	T-2	1993	1	A	1		
Centrifuge	Kokusan	H-108M2	1993	1	A	1		
Drying oven	Sanko	MOV-212F	1993	1	A	1		
Microscope	Erma	ARMAX-1		4	A			4
Water bath	Kayagaki Irika	KTM-30S		1	A	1		
Water distiller	Advantec Toyo	GS-200	1993	1	A	1		
Refrigerator	Toshiba	GR-A41EC	1993	3	A	2		
Incubator	Sanyo	MIR262	1993	2	A	1		1
Pipette wash and drier	Kayagaki Irika	A242	1995	2	A	2		
Hematocrit gauge	Kubota	3100	1993	1	A	1		
Hemacytometer, Neubauer	Kayagaki Irika	A121	1993	5	A	2		3
Hemometer, Sahli	Kayagaki Irika	A301	1993	3	B			3
Blood sedimentation set	Kayagaki Irika	A327	1993	5	A	5		
Balance	Toa balance	NO.26	1995	1	A	1		
Differential leucocyte counter	Kayagaki Irika	KYG-8		1	B		1	
Bioling sterilizer	Toma Medical	NIL	1993	6	A	3		3
ECG (1ch)	Fukuda	FX-1201	1993	2	A	2		
Icecube machine	Sanyo electric	SIM-S60	1993	1	A	1		
Printer	Hewlett Packard	DeskJet 600		1	A			1
Hot oven	Prolabo		1993	1	B	1		
Microscope	Nikon	SE-B-2	1995	30	A	24+		
Fluorescence microscope	Nikon	Y2F-EFD3	1995	1	A	1		
Vehicle	Mitsubishi	W32WNHC	1995	2	A	2		
Clean bench	Dalton	BGB-1000S	1995	2	A	2		
Coagulator	Hirasawa	C-200CP	1995	1	A	1		
Computer	Apple	Mac Performa 6400		1	A	1		
Printer	Epson	Stylus Color 500	1996	1	A	1		
Computer	IClassic			1	A			1
Computer	Preview			1	A			1
Printer	HP	Laser Jet 4L		1	A		1	
Printer	HP	Desk Jet 600		1	A	1		
Vehicle	Toyota	Land Cruser		1	A		1	
Vehicle	Toyota	Pick up		2	A		2	

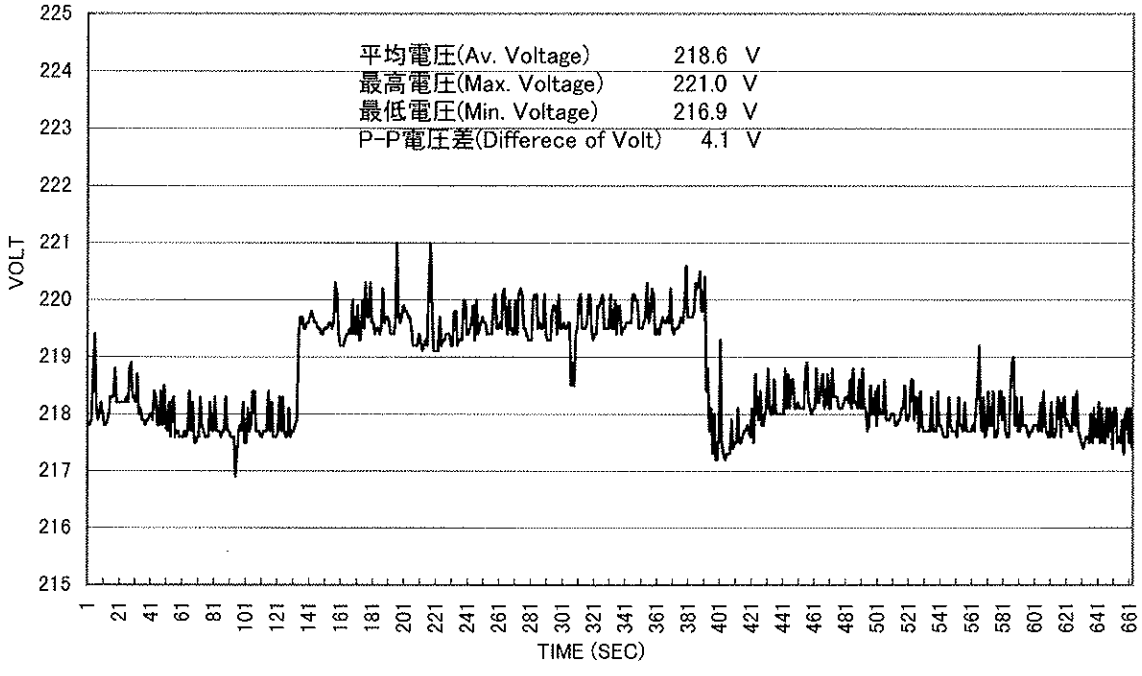
Name	Manufacturer	Model	Date Purchased	Q'ty	Reported Condition	Revised		
						A	B	C
Vehicle	Toyota	Diesel		2	A			2
Copy machine	Canon	NP 1215		1	B			1
Motor cycle	Honda	76 cc		6	A	6		
OHP	kinderman	Farmulas 2		1	B		1	
Generator				3	A	3		
TV monitor (29 inch)	JVC	AV-S29X1		1	A	1		
Video camera w/ tripod	Hitachi	VM-2580E		1	C	1		
Videocassette deck	Hitachi	VT-F787EM		1	C			1
Laundry machine	Toshiba	VH-3370E		3	A	3		
Tube rack for 20 tubes	Iuchi		1995	10	A	10		
Tube rack for 50 tubes	Iuchi		1995	20	A	20		
Pipette aid	Kayagaki Irika	7566	1995	2	A	2		
Pipette case	Iuchi		1995	2	A	2		
Pipette sterilizing box	Kayagaki Irika		1995	10	A	10		
Dressing drum, dia. 18x12 m	Kayagaki Irika	G715-26		2	A	2		
Test tube wire case	Kayagaki Irika		1995	6	A	6		
Slide glass rack	Kayagaki Irika	E131	1995	2	A	1	1	
Test tube mixer	Iuchi	NS-603E	1995	2	A	2		
Timer	Iuchi		1995	2	A	2		
Stainless steel pots w/ lid	Iuchi		1995	4	A	4		
Gas burner	Kayagaki Irika		1995	4	A	4		
Aspirator	Iuchi		1995	6	A	6		
Microscope	Nikon	Labophoto II Y2F-16	1997	1	A	1		
Micrographer	Nikon	H-III-35	1997	1	A	1		
Paper cutter	Kokuyo		1996	1	A	1		
Seal making machine		HS-305	1996	1	A	1		
Black board	Kokuyo		1996	1	A	1		
UPS	Sunpac	500 VA	1998	2	A	2		
Autovoltage regulator	Lion	1000 VA	1997	2	A	2		
Autovoltage regulator	Lion	2000 VA	1997	2	A	2		
Autovoltage regulator	Lion	3000 VA	1997	2	A	2		
Copy machine	Canon	NP6016	1996	1	A		1	
OHP	3M	M9050	1995	1	A	1		
OHP	3M	2770 100V	1995	1	A			1
Computer	Compac	Contura 3420C	1995	1	A		1	
Spectrophotometer*								1
Water Distiller*	Kayagaki Irika		1995			1		

Note *: Equipment added during B/D Study
+: Six of those devices are used at Health Centers
Condition A: Working well
Condition B: Partially Working and/or Frequent Malfunction
Condition C: Not Working

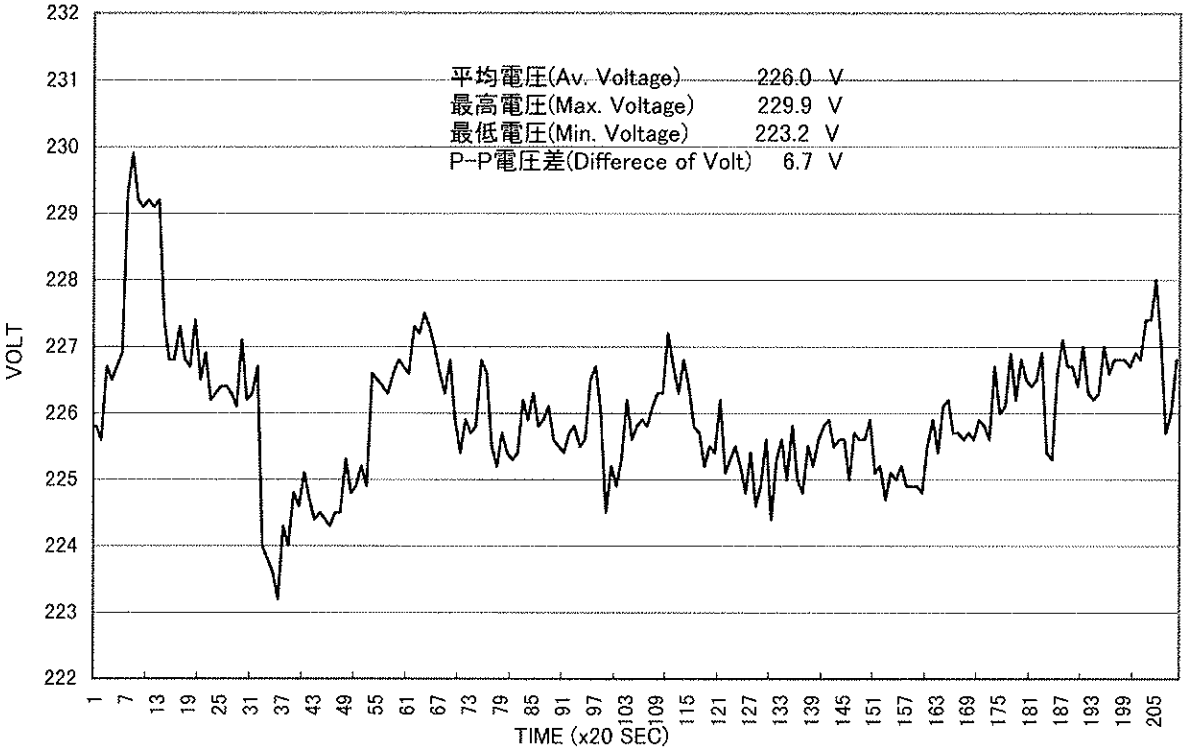
VOLTAGE FLUCTUATION
1 sec interval without stabilizer(990426)



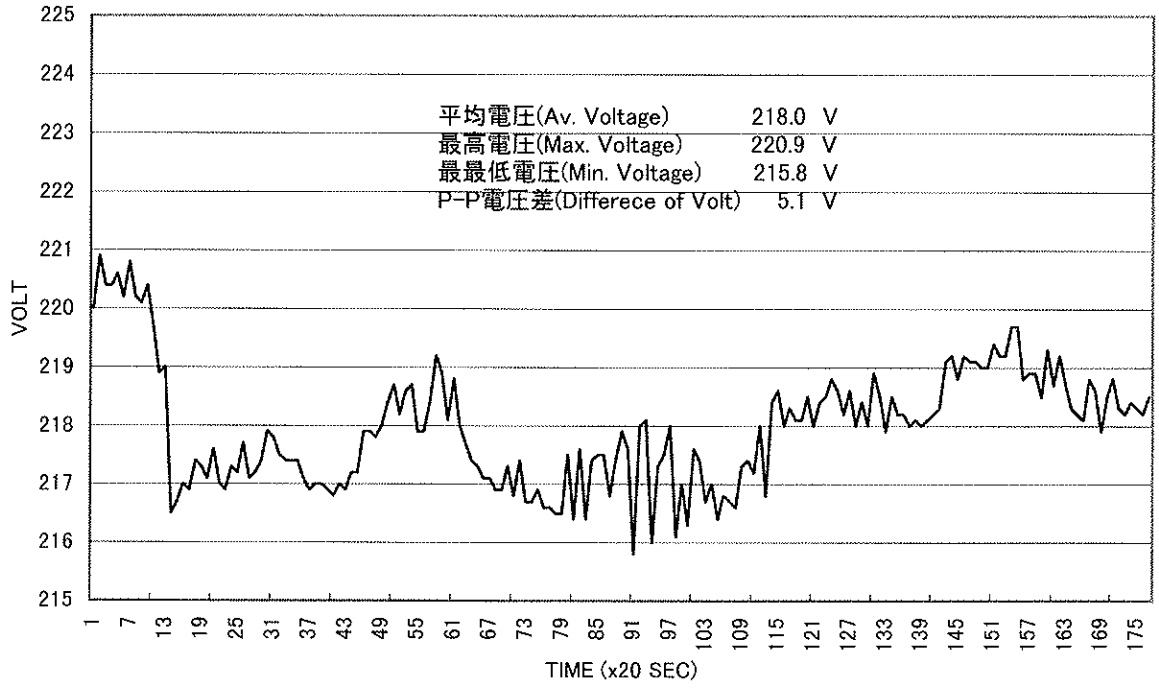
VOLTAGE FLUCTUATION
1 sec interval with stabilizer(990426)



VOLTAGE FLUCTUATION
20 sec interval without stabilizer(990426)



VOLTAGE FLUCTUATION
20 sec interval with stabilizer(990426)



(6) Building Material Plan

1) Basic Policy

The building materials to be proposed shall be selected taking into consideration the climatic conditions, the location of the site, the local construction situation, construction period, construction cost, and maintenance and operation costs. Particularly, the following matters shall be considered:

a) The local procurement of construction materials shall be considered to reduce construction costs and shorten the construction period.

b) The maintenance and operation costs shall be reduced by considering materials that are suitable for the local climate and easy to maintain.

c) The essential functions of CENAT as a referral Center for TB Control and for the effectiveness of training, together with the building layout and equipment plans, must be considered when studying possible building construction materials.

d) Selection and determination of the building materials shall be based on the studies for the local procurement or application of local construction methods.

e) The control of quality during the construction phase shall be taken into consideration when selecting the construction materials.

2) Main Materials

In the selection of the main finishing materials used for the building, the local construction situation and construction schedule, as well as operation and maintenance costs should be considered.

a) Structural Materials

Reinforced concrete for the main frames with brick work for the walls are the usual materials for this type of construction. If ready mixed concrete is considered, the distance of the batch plant from the site and its ability to provide the required quantities and quality are important. It is necessary to consider the quality and supply of materials such as aggregate, cement, sand and bricks. For the roof structure, a steel frame will be considered.

b) Exterior Finishing

Bituminous membranes and sheet metal should be used as weather-proofing finishing materials. Exterior walls will be finished with washed terrazzo or painted with long-lasting weatherproof paint.

Roofs

Roofing tiles are commonly used in Cambodia, though corrugated iron sheets are also used for some buildings. For the new CENAT building, to make the appearance of the new building's roof match the surrounding landscape, a tiled roof will be used.

Window and Doors

In order to provide fresh air and light, aluminum windows are a better choice than wooden windows. Aluminum windows have become more popular in recent years in Cambodia because of their low maintenance costs and durability.

Floors

Terrazzo or ceramic tile will be used for the Project, because of the excellent wearing characteristics. Corridor floors are best finished with non-slip ceramic tile or washed terrazzo surface.

c) Interior Finishing

Interior finishing materials will be selected to match room functions and space use.

Floors

Flooring material should be durable and easy to maintain. Ceramic tiles in combination with plastic tile will be used.

Flooring material for the Large Meeting Room will be selected taking into consideration variable use of the space.

Walls

Interior walls will be plastered with a paint finish. It is desirable that the interior walls should be easy to clean. Walls in the Large meeting Room will be selected so as to provide the best sound and lighting effects.

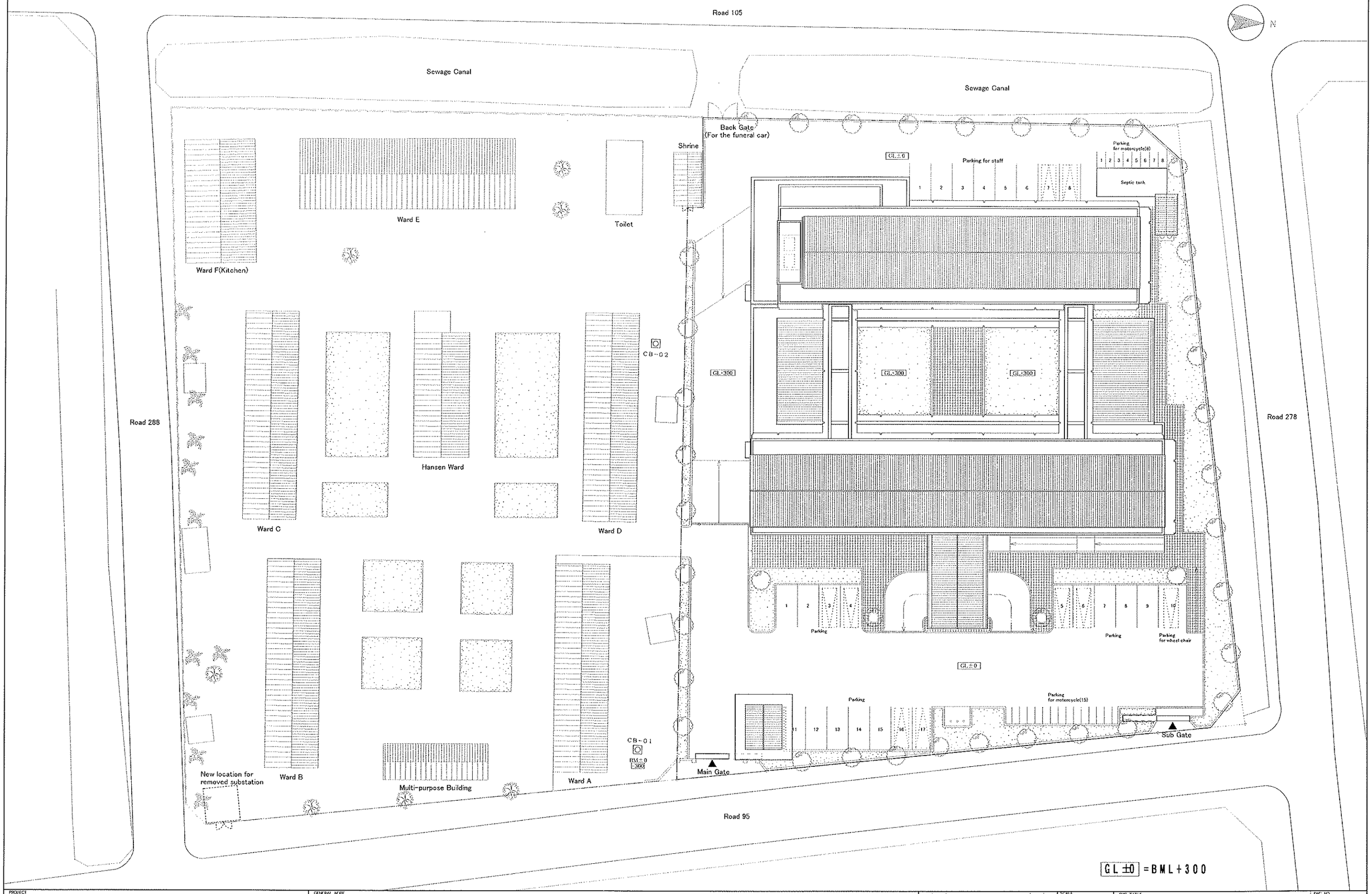
Ceilings

The rooms of the existing buildings have a painted finish on a plaster ceiling. The same idea will be applied to the new buildings.

Table 2-3-4 Proposed Materials

Structure			Reinforced concrete and steel structure				
Floor height			4,000 mm				
Exterior Finishing	Roof		Glazed terracotta roof tile, Paint water proofing for flat roof				
	Eaves		Non-asbestos cement board, Epoxy painting				
	Exterior walls		Trowelled Mortar, Terrazzo or Sprayed Epoxy painting, Louver: Perforated block (Unglazed block or with exterior paint)				
	Door & Windors						
	1) Windows		1) SW (X-ray shielding with a lead equivalent 1.5Pb)	Aluminum			
	2) Doors		2) SD (X-ray shielding with a lead equivalent 1.5Pb)	Aluminum			
	Exterior Floor		Terracotta tile with washed terrazzo or Mortar bed				
Interior Finishing	Rooms		X-ray	General Rms.	Consultation Rm.	Meeting Rm.	Warehouse	Corridor
	Floor		Mortar bed Ceramic Tile	Mortar bed Ceramic Tile	Mortar bed Ceramic Tile	Mortar bed Wood flooring	Mortar bed	Mortar bed Ceramic tile
			Mortar bed Epoxy paint (X-ray shielding)	Mortar bed Epoxy paint	Mortar bed Glazed ceramic tile	Mortar bed Wood finish	Mortar bed Epoxy paint	Mortar bed Epoxy paint
			Skirting tile	Skirting tile	Skirting tile	Skirting tile	—	Skirting tile
	Ceilings		Plaster board with paint	Plaster board (False Ceiling)	Plaster board False Ceiling)	Rock-wool board (EP)	Mortar bed Epoxy paint	Plaster board with paint
	WC	Floor	Ceramic Tile					
		Walls	Mortar bed, Epoxy paint (H ≥ 1,900) and Ceramic tile (H ≤ 1,900)					
		Ceilings	Plaster board with paint					

(7) Basic Design Drawings and Equipment List



PROJECT

THE PROJECT FOR IMPROVEMENT OF THE NATIONAL TUBERCULOSIS CENTER IN THE KINGDOM OF CAMBODIA

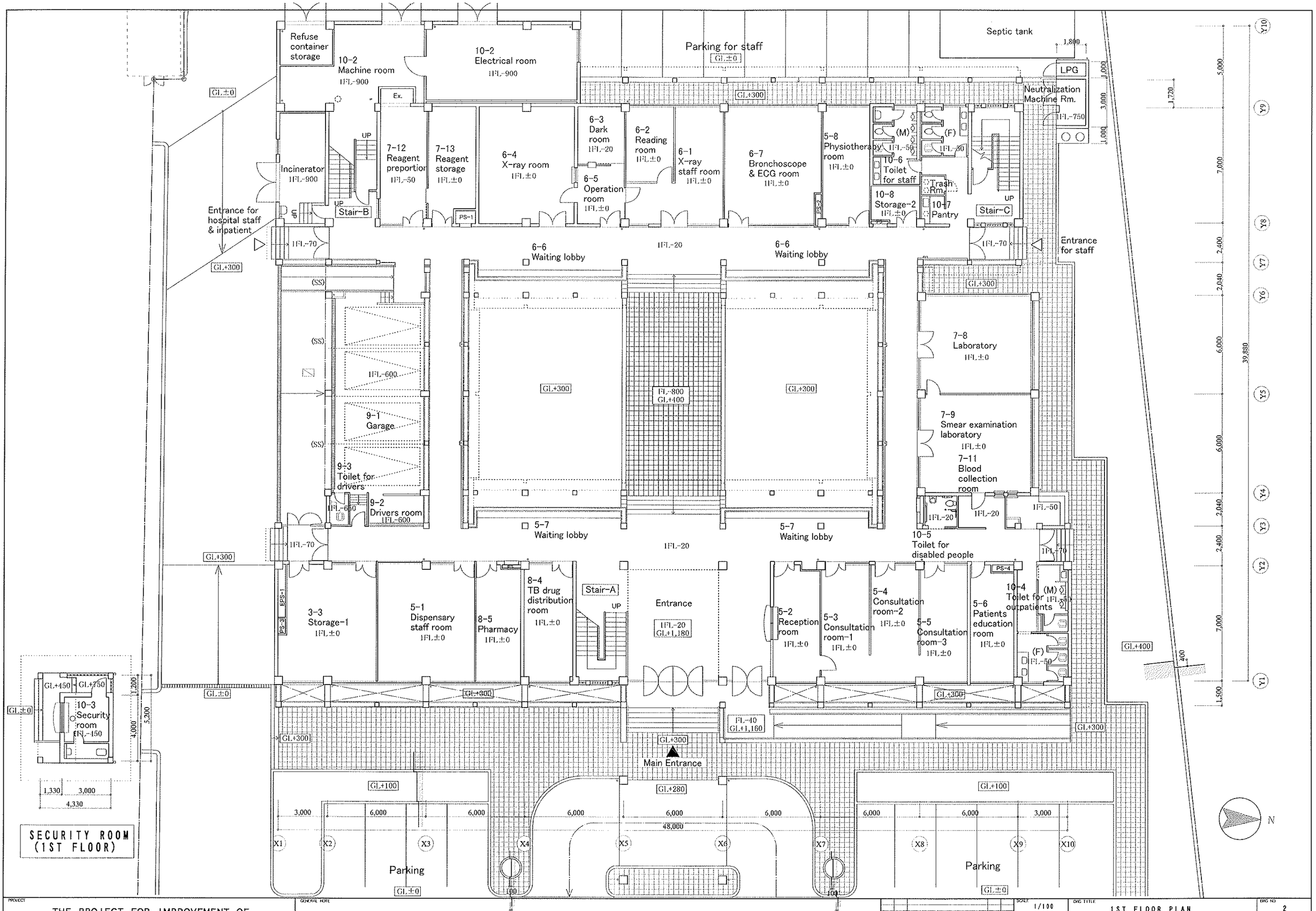
GENERAL NOTE

NO	DATE	DESCRIPTIONS REVISIONS	BY	APP'D

SCALE 1/200
DATE 11 JAN. 2000
DRAWING BY ITCI
CHECKED BY

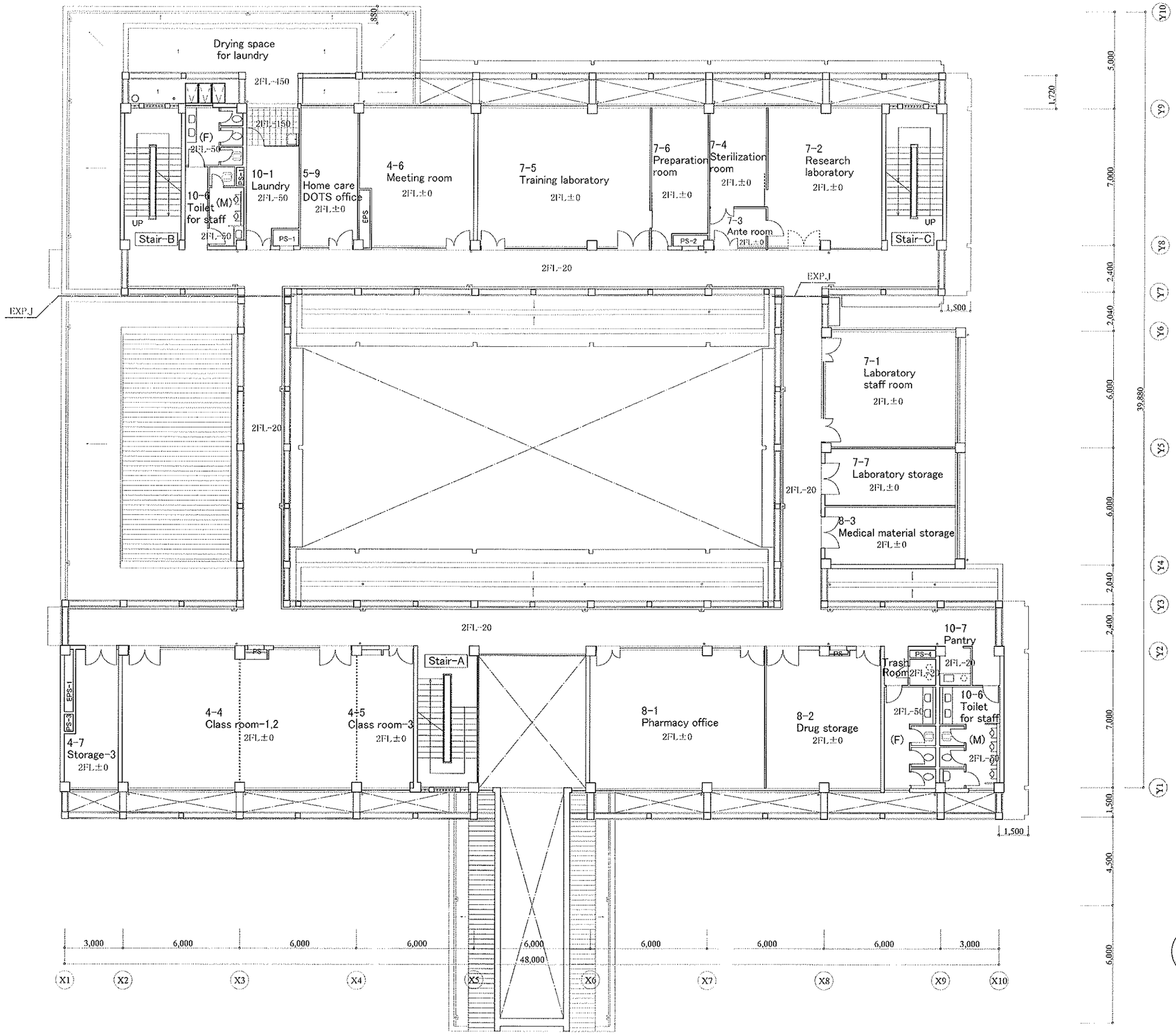
DWG TITLE SITE LAYOUT PLAN
DWG NO. 1

DESIGNED BY PACIFIC CONSULTANTS INTERNATIONAL
Σ K ITO ARCHITECTS&ENGINEERS INC.



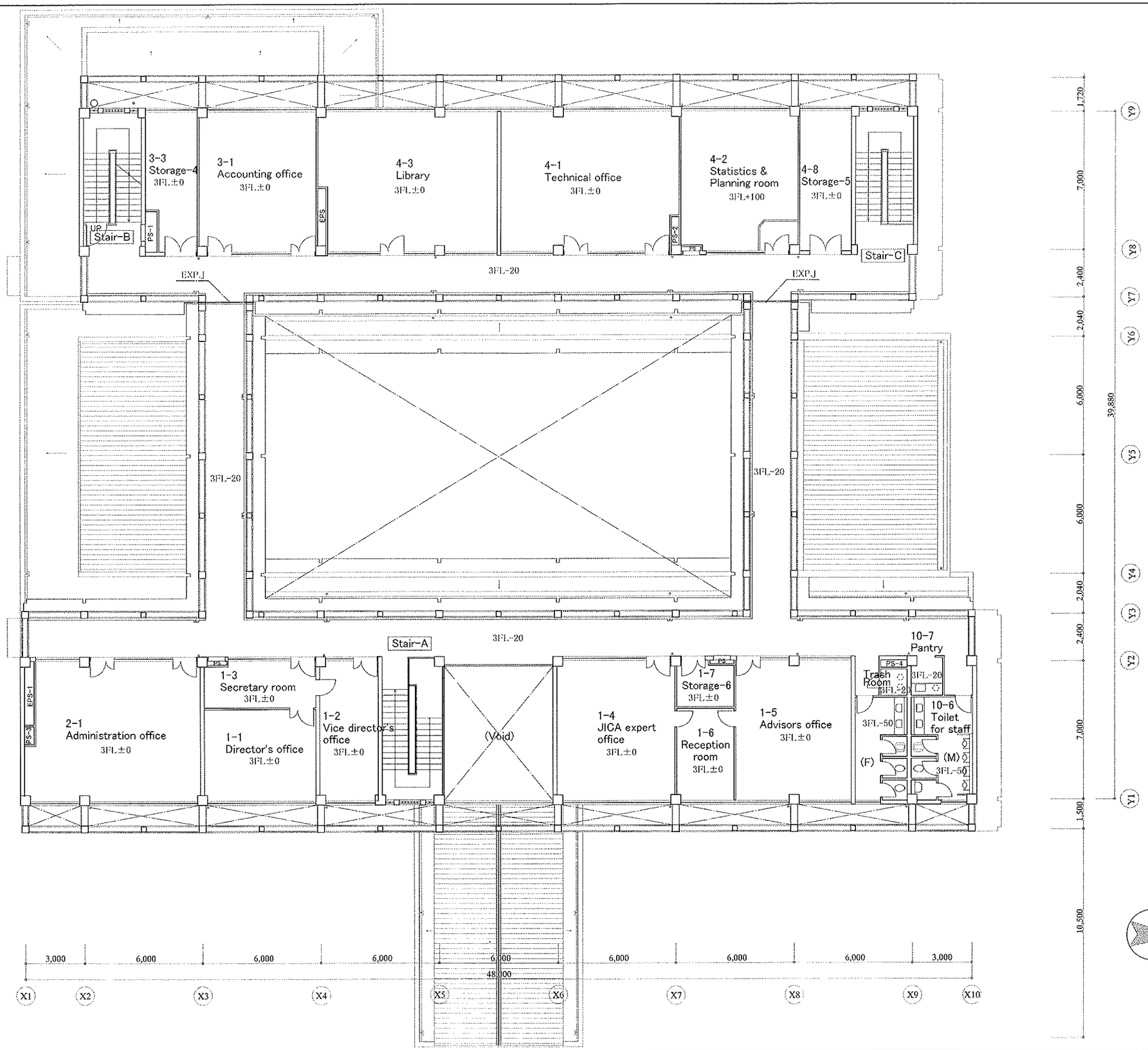
SECURITY ROOM (1ST FLOOR)

PROJECT: THE PROJECT FOR IMPROVEMENT OF THE NATIONAL TUBERCULOSIS CENTER IN THE KINGDOM OF CAMBODIA	GENERAL NOTE	SCALE: 1/100	DWG TITLE: 1ST FLOOR PLAN
		DATE: 11 JAN. 2000	DWG NO: 2
	NO. DATE DESCRIPTIONS REVISIONS BY APP'D	DRAWING BY: JICA	DESIGNED BY: PACIFIC CONSULTANTS INTERNATIONAL / K ITO ARCHITECTS&ENGINEERS INC
		CHECKED BY:	



PROJECT	THE PROJECT FOR IMPROVEMENT OF THE NATIONAL TUBERCULOSIS CENTER IN THE KINGDOM OF CAMBODIA
GENERAL NOTE	
SCALE	1/100
DATE	11 JAN. 2000
DRAWING BY	
CHECKED BY	
DWG TITLE	2ND FLOOR PLAN
DWG NO	3
DESIGNED BY	PACIFIC CONSULTANTS INTERNATIONAL K ITO ARCHITECTS&ENGINEERS INC

NO DATE DESCRIPTIONS BY APP'D
REVISIONS



PROJECT

THE PROJECT FOR IMPROVEMENT OF
THE NATIONAL TUBERCULOSIS CENTER
IN THE KINGDOM OF CAMBODIA

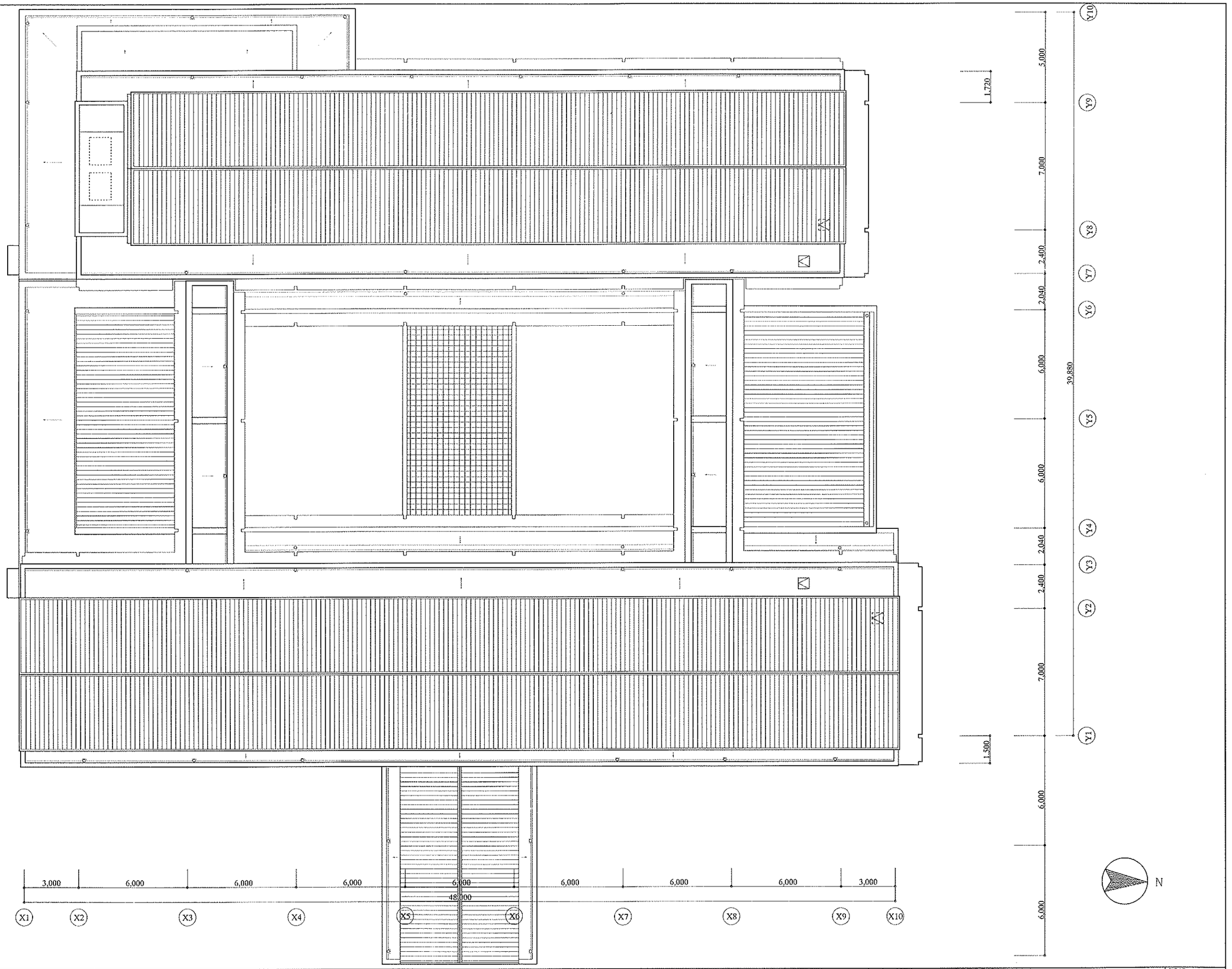
GENERAL NOTE

NO	DATE	DESCRIPTIONS	BY	APP'D
		REVISIONS		

SCALE: 1/100
DATE: 11 JAN. 2000
DRAWING BY: JPCI
CHECKED BY:

DWG TITLE: 3RD FLOOR PLAN
DWG NO: 4

DESIGNED BY: PACIFIC CONSULTANTS INTERNATIONAL
Σ K ITO ARCHITECTS&ENGINEERS INC



PROJECT

THE PROJECT FOR IMPROVEMENT OF THE NATIONAL TUBERCULOSIS CENTER IN THE KINGDOM OF CAMBODIA

GENERAL NOTE

NO.	DATE	DESCRIPTIONS / REVISIONS	BY	APP'D

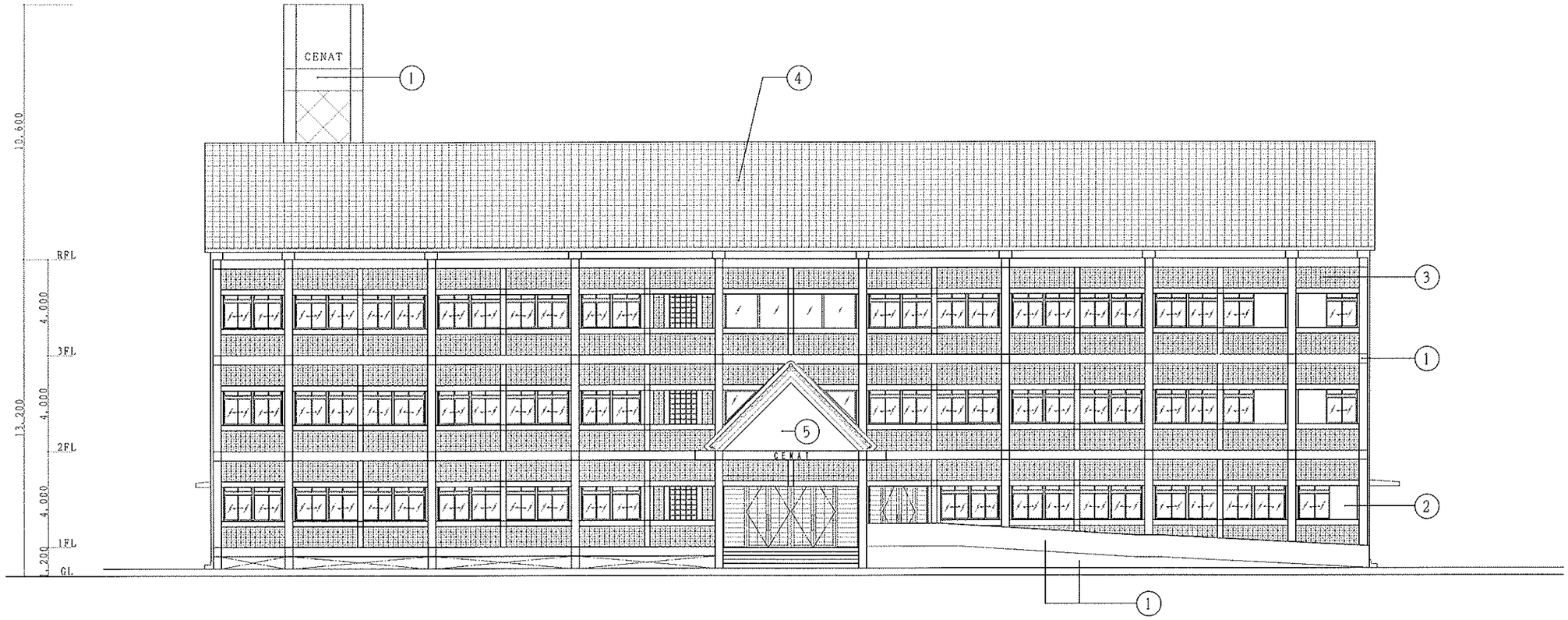
SCALE 1/100
DATE 11 JAN. 2000
DRAWING BY JICA
CHECKED BY

DWG TITLE ROOF FLOOR PLAN

DWG NO. 5

DESIGNED BY PACIFIC CONSULTANTS INTERNATIONAL
K. ITO ARCHITECTS&ENGINEERS INC.

NO.	MATERIAL/FINISN
①	WASHED TERRAZZO
②	EPOXY RESIN SPRAY PAINT
③	TERRACOTTA VENT BLOCK
④	TILE ROOFING
⑤	PRE-CAST MORTAR RELIEF
⑥	GASS BLOCK (HEAT REFLECT)
⑦	VENTILATION LOUVER



EAST ELEVATION

PROJECT
THE PROJECT FOR IMPROVEMENT OF THE NATIONAL TUBERCULOSIS CENTER IN THE KINGDOM OF CAMBODIA

GENERAL NOTE

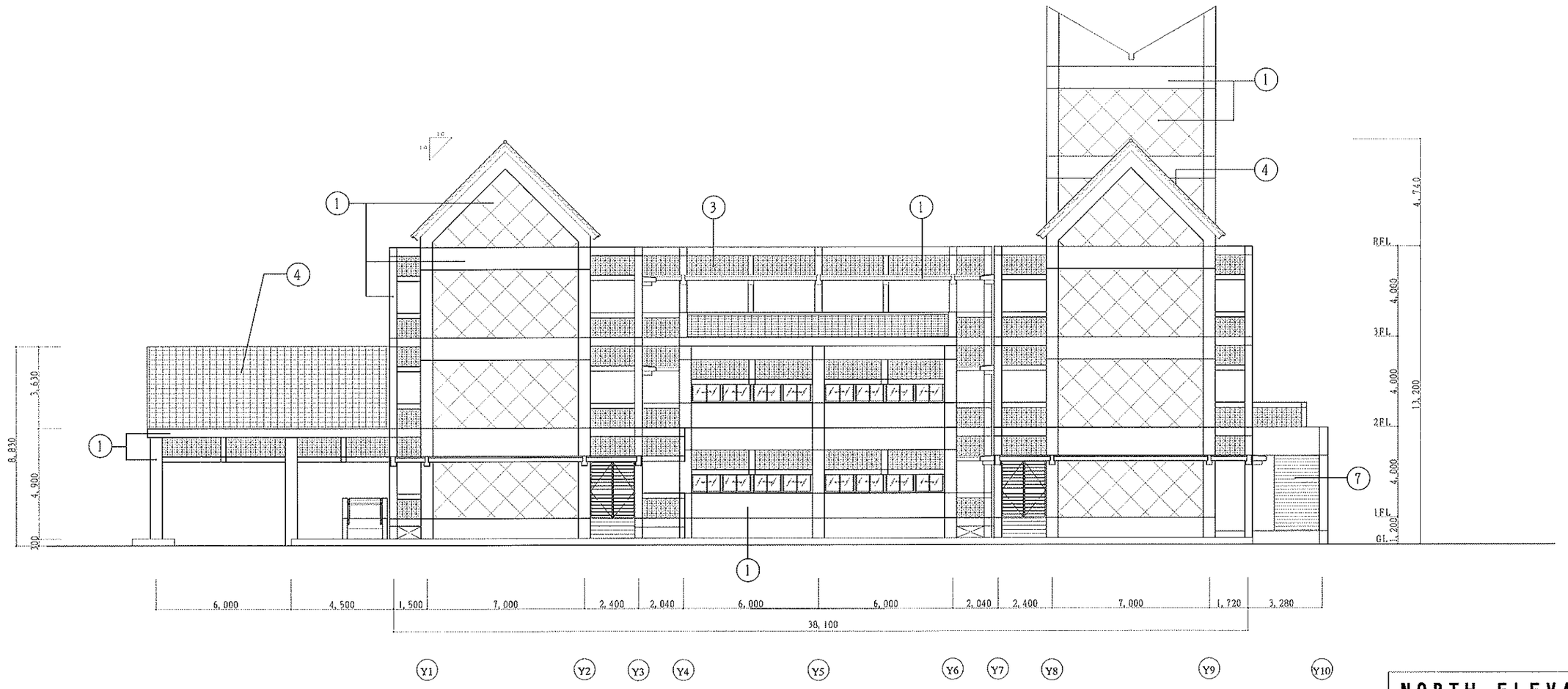
NO	DATE	DESCRIPTIONS REVISIONS	BY	APP'D

SCALE 1/100
DATE 11 JAN. 2000
DRAWING BY JTCI
CHECKED BY

DWG TITLE ELEVATION-1
DWG NO 6

DESIGNED BY PACIFIC CONSULTANTS INTERNATIONAL
K ITO ARCHITECTS&ENGINEERS INC.

NO.	MATERIAL/FINISN
1	WASHED TERRAZZO
2	EPOXY RESIN SPRAY PAINT
3	TERRACOTTA VENT BLOCK
4	TILE ROOFING
5	PRE-CAST MORTAR RELIEF
6	GASS BLOCK (HEAT REFLECT)
7	VENTILATION LOUVER



NORTH ELEVATION

PROJECT

THE PROJECT FOR IMPROVEMENT OF THE NATIONAL TUBERCULOSIS CENTER IN THE KINGDOM OF CAMBODIA

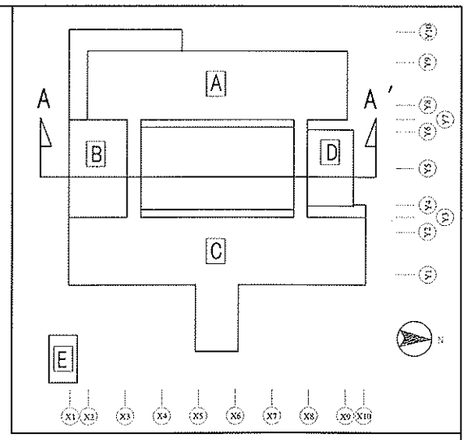
GENERAL NOTE

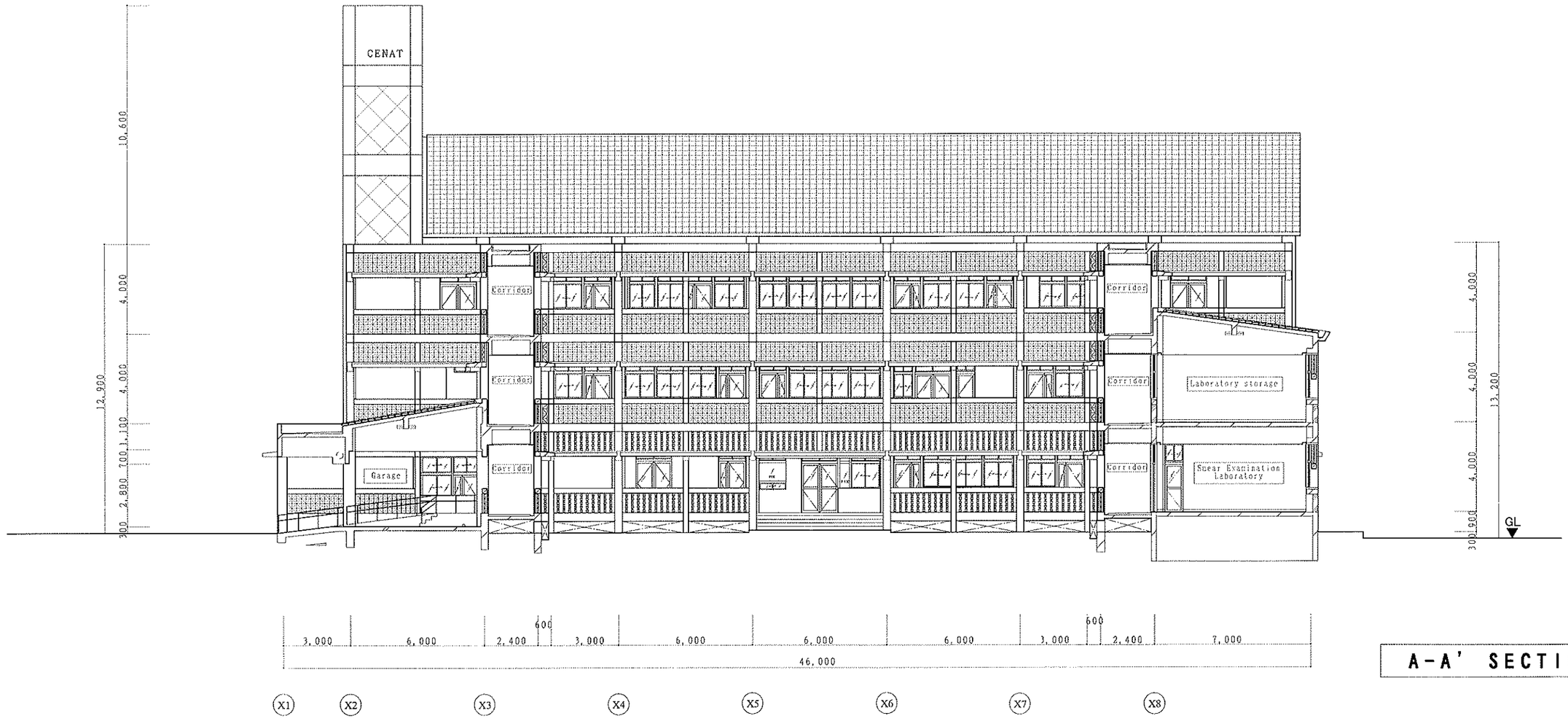
NO.	DATE	DESCRIPTIONS REVISIONS	BY	APP'D

SCALE: 1/100
DATE: 11JAN. 2000
DRAWING BY:
CHECKED BY:

DWG TITLE: ELEVATION-2
DWG NO: 7

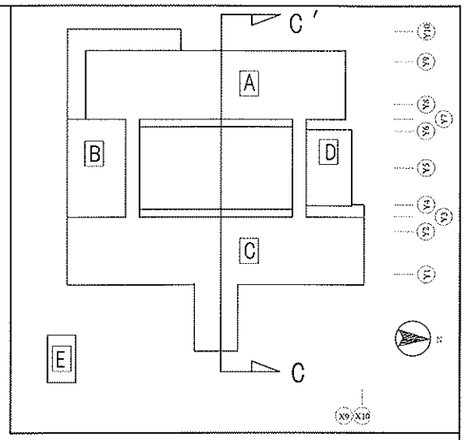
DESIGNED BY: PACIFIC CONSULTANTS INTERNATIONAL
Σ K ITO ARCHITECTS&ENGINEERS INC.

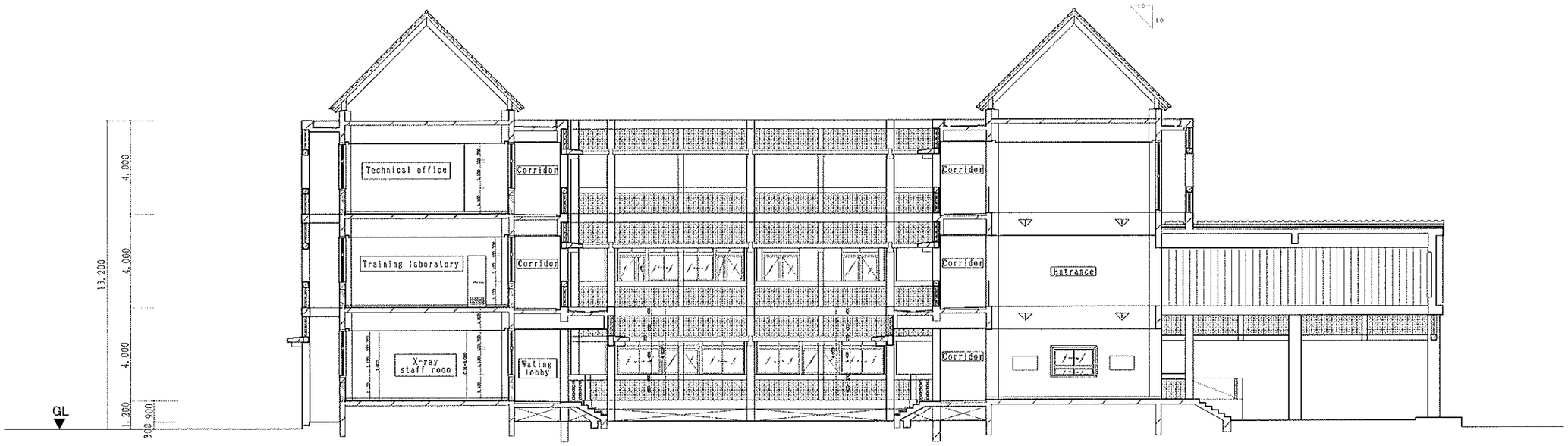




A-A' SECTION

PROJECT: THE PROJECT FOR IMPROVEMENT OF THE NATIONAL TUBERCULOSIS CENTER IN THE KINGDOM OF CAMBODIA	GENERAL NOTE	NO / DATE / DESCRIPTIONS / BY / APP'D — REVISIONS	SCALE: 1/100	DWG TITLE: SECTION - 1	DWG NO: 8
			DATE: 11 JAN. 2000	DESIGNED BY: PACIFIC CONSULTANTS INTERNATIONAL / K ITO ARCHITECTS&ENGINEERS INC.	
			DRAWING BY:		
			CHECKED BY:		





C-C' SECTION

PROJECT

THE PROJECT FOR IMPROVEMENT OF
THE NATIONAL TUBERCULOSIS CENTER
IN THE KINGDOM OF CAMBODIA

GENERAL NOTE

NO	DATE	DESCRIPTIONS / REVISIONS	BY	APP'D

SCALE 1/100
DATE 11 JAN 2000
DRAWING BY
CHECKED BY

DWG TITLE SECTION - 2
DWG NO 9

DESIGNED BY PACIFIC CONSULTANTS INTERNATIONAL
Σ K ITO ARCHITECTS&ENGINEERS INC.

EQUIPMENT LIST

No.	Item No.	Items	Q'ty set(s	Department	Rm. No.
1	AO- 1	Typewriter Table	1	Administration Office	2-1
2	AO- 2	Typewriter, Khmer	1	Administration Office	2-1
3	AO- 3	Typewriter, English	1	Administration Office	2-1
4	AO- 4	Typewriter Table	1	Administration Office	2-1
5	DP- 1	TV Complete Set	1	Dispensary	5-6
6	DP- 2	Negatoscope	3	Dispensary	5-3, 5-4, 5-5
7	DP- 3	Examination Bed	3	Dispensary	5-3, 5-4, 5-5
8	LU- 1	Laboratory Table (sink)	1	Laboratory Unit	7-2,7-3,7-6,7-8,7-9,7-12
9	LU- 2	Lab Table, Center w/ Sink	1	Laboratory Unit	7-2,7-5,7-8,7-9
10	LU- 3	Lab Table (corner table)	1	Laboratory Unit	7-2,7-4,7-6,7-8,7-9,7-12
11	LU- 4	Lab Table, Side w/ Drawers	1	Laboratory Unit	7-2,7-4,7-5,7-6,7-8,7-9,7-12
12	LU- 5	Lab Table, w/ Unit Sink	1	Laboratory Unit	7-2,7-4,7-5,7-6,7-8,7-9,7-12
13	LU- 6	Incubator	1	Laboratory Unit	7-2
14	LU- 7	Pharmaceutical Refrigerator	1	Laboratory Unit	7-8
15	LU- 8	Refrigerator	1	Laboratory Unit	7-8
16	LU- 9	Deep Freezer	1	Laboratory Unit	7-2
17	LU- 10	Distilling Apparatus	2	Laboratory Unit	7-6, 7-8
18	LU- 11	Chairs for Lab Tables	1	Laboratory Unit	7-2,7-3,7-5,7-6,7-8,7-9
19	LU- 12	Safety Cabinet	2	Laboratory Unit	7-6
20	LU- 13	White Board	1	Laboratory Unit	7-1
21	LU- 14	White Board	1	Laboratory Unit	7-5
22	LU- 15	Over Head Projector	1	Laboratory Unit	7-5
23	PM- 1	Photocopier	1	Program Management	1-3
24	TO- 1	TV Complete Set	1	Technical Office	4-7
25	TO- 2	Camera VCR	1	Technical Office	4-1
26	TO- 3	Computer Complete Set	3	Technical Office	4-2
27	TO- 4	Computer Desk	3	Technical Office	4-2
28	TO- 5	Overhead Projector	1	Technical Office	4-7
29	TO- 6	Screen	3	Technical Office	4-7
30	TO- 7	Slide Projector	1	Technical Office	4-7
31	TO- 8	Sound System	1	Technical Office	4-7
32	TO- 9	Projector for Computer	1	Technical Office	4-7
33	TO- 10	Printing Machine	1	Technical Office	4-1
34	TO- 11	White Board	2	Technical Office	4-7
35	TO- 12	Projector	1	Technical Office	4-7
36	XU- 1	X-ray Film Processor	1	X-ray Unit	6-3
37	XU- 2	Negatoscope	2	X-ray Unit	6-2
38	XU- 3	Negatoscope	1	X-ray Unit	6-7
39	XU- 4	X-ray Unit w/Bucky Table	1	X-ray Unit	6-4, 6-5
40	XU- 5	Negatoscope	1	X-ray Unit	4-7
41	KK- 1	Furniture	1	Relevant Departments	Relv't Rms

CHAPTER 3
IMPLEMENTATION PLAN

CHAPTER 3 IMPLEMENTATION PLAN

3-1 Implementation Plan

3-1-1 Implementation Concept

The understanding of the basic procedure of this project under Japan's Grant Aid is important prior to the implementation of the Project. The procedure for the Project and the matters to be considered and confirmed are as follows:

(1) Basic Items

1) The Exchange of Notes (E/N) shall be concluded between the Government of Japan and the Royal Government of Cambodia after the completion of the Basic Design Study in 1999.

2) With the E/N, the Government of Japan shall commit itself officially to implement the Project.

3) After the E/N, a consultant contract shall be concluded between a Japanese consultant and the Government of the Kingdom of Cambodia, and detailed design work shall be started immediately.

(2) Final Confirmation of the Project Components and the Tendering Process

1) Prior to the Preparation of Tender Document, full details of facilities and equipment plans as developed during the Basic Design Study should be discussed with the implementation agency, and confirmed.

2) The consultant shall discuss the technical matters through meetings with the relevant authorities in Japan and Cambodia during the final confirmation stage of detailed design.

3) The tender documents shall be prepared after the review of the Basic Design Study. The tender for the construction work and procurement and installation work shall be conducted in accordance with JICA guidelines.

4) The Tender/Contract shall be conducted either as one package with a single Contractor or split into two packages with a Contractor to carry out the construction work and a Supplier for the procurement and installation of the equipment.

5) The Consultant will assist the implementation agency with the tender procedure in accordance with the guidelines of JICA.

(3) Construction of Facilities and Procurement and Installation of Equipment

1) According to this study, most of the materials will be procured from the third countries. In order to reduce the cost, and allow easy maintenance, materials should be procured in Cambodia as much as possible. It is considered that the transportation plans and schedules for construction equipment and materials are the major factors in formulating an implementation schedule.

2) The Prime Contractor for the Project will be a Japanese contractor who will undertake the construction work, supported by local contractors sub-contracted to the Prime Contractor. However, some foremen and skilled engineers from the third countries will be engaged because of the lack of local skilled engineers.

3) The procurement and installation of the equipment should be coordinated with the Construction so that the implementation schedule and technical management can be controlled smoothly. Most of the equipment will be procured from the third countries or Japan. Procurement schedule including transportation schedule should be planned carefully. However, only the X-ray machine and some laboratory tables require coordination with the construction work.

(4) Implementation Organization

The organizations involved in this project are as shown below:

1) The Ministry of Health, the Government of the Kingdom of Cambodia is the Responsible Agency for the administration of this project.

2) The National Tuberculosis Center, the Ministry of Health (CENAT) is the Implementation Agency for the Project.

The following diagram shows the relationship between the Government of Cambodia, and the Japanese Consultant and Contractor.

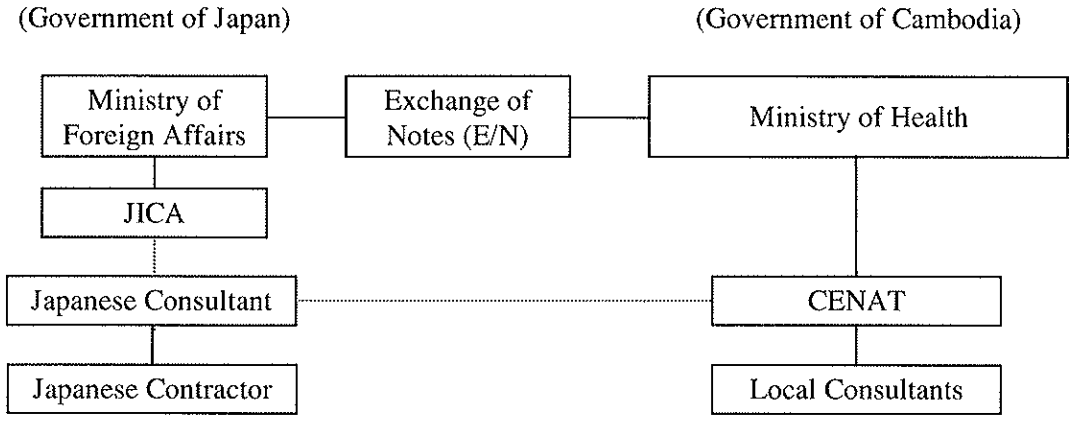


Fig. 3-1 Implementation Organization

3-1-2 Implementation Conditions

(1) Contractors and Workers

There are very few large contractors in Cambodia. Most large scale construction project have been undertaken by foreign contractors. Local contractors have been engaged as sub-contractors for some particular portion of the works.

In order to maintain the construction schedule and the quality of construction work, it will be necessary to employ foremen and skilled workers from outside Cambodia. This will be especially necessary for the form work, fixing of reinforcing bars, installation of windows, interior finishing, electrical work, and mechanical work and plumbing work.

For this project, a Japanese contractor will be the main contractor because of the Grant Aid scheme. It is expected that the Japanese contractor will transfer technology to the local contractors and workers.

(2) Important notice for construction work

The construction situation in Cambodia, and the points to be considered during the construction stage are as follows.

1) The project site is small and limited to half of the CENAT site. The temporary office and contractors operations should be planned with consideration of efficient use of the limited space.

2) The construction method shall avoid any vibration which may disturb existing ward buildings, existing facilities and housing.

3) The safety of the patients and staff access to and egress from the ward area next to the project site must be considered and ensured.

4) A High School is located next to the project site, and students' motorcycles are parked in the narrow space along the Project site. When construction materials and machines are carried in to the site, attention should be paid to be safety of the students.

5) It is planned to renovate the canal along the CENAT site with ADB support. Though the renovation work of the part near the CENAT is planned to be carried out in the middle of 2001, the details and schedule of the project should be confirmed, and coordinated with this project.

6) The CENAT site is sometimes flooded during the rainy season. Before the commencement of construction, ground leveling work (including banking to raise the ground level) will be carried out by the Cambodian side. Measures to protect the site from the inflow of rain water and earth and sand from the canal, and a well planned drainage system, should be prepared.

7) The application procedures and necessary documents are as follows;

Application Procedures	Necessary Documents	Term of Approval
Approval of Planning	Application forms, and Architectural and Structural drawings.	45 days
Approval for construction and demolition	Application forms, and Architectural and Structural drawing	45 days

3-1-3 Scope of Works

The portions to be dealt with by the Japanese side and by the Cambodian side for the implementation of Japan's Grant Aid Program are shown in Table 3-1. The project cost for the portions to be dealt with by the Cambodian side is as shown on Appendix-5.

Table 3-1 Scope of Works

Portions by the Japanese Side	Portions by the Cambodian Side
(1) Building Works Structure works, finishing works (2) Electrical Works Power trunk facilities, lighting, power outlets, P/A systems (3) Utilities and Facilities a) Water Supply Construction works for the Water supply from the valve at the water supply meter to the building and all the related internal works for the water supply. b) Sewerage system including piping works up to the connection manhole c) Sanitation facilities (waste water treatment facility) d) Elevated tank and reserve tank e) Fire-extinguishing facilities f) Electrical Cabling works g) Generator Works h) Telecommunication system Cabling works from MDF/PABX to the facilities, and installation of conduit from the site border line to MDF. i) Lightning Protection System j) External Lighting system in the site (4) Exterior Work Road, path and parking lots within the site (5) Equipment Equipment for the Project (6) Electric Room, Electric Generator Room, Pump Room (7) Incinerator	(1) Site Preparation a) Ground preparation including the clearance and leveling of the land, demolition of existing buildings and repairing of the existing fence. b) Temporary power and water supply for the construction (2) External Works and Approach Roads - Landscaping, planting, and fence, etc within the Site. (3) Utilities and Facilities for New Buildings a) Water Supply Construction from the main feeder to the water valve at the water supply meter including the water supply meter. b) Sewerage Piping works from the connection manhole at the site to the existing sewerage line including the repair work of the existing ditch. c) Storm Drainage Drainage line from the site to the existing line including the expansion work of the existing drainage line. d) Electrical Work Cabling works from the existing power supply point to the new Electrical room in new CENAT Building. e) Telecommunication Work Cabling work for Direct/Extension/Public telephone) from the existing Point Distribution to Point Distribution for new MDF/PABX in the new CENAT building. f) The provision of gas (LPG) cylinders for the Lab. (4) Others a) Governmental works including the application and obtaining Governmental approvals and permissions b) Smooth custom clearance, tax exemptions and prompt internal transportation for the imported construction materials and equipment c) Commissions to the Japanese foreign exchange bank for its banking services based upon the Banking Arrangement namely the advising commission of the "Authorization to Pay" and payment commission (5) Management, operation and maintenance cost for the new building and facilities (6) Tax exemptions and necessary preferential treatment for the construction staff from Japan or other countries (7) Smooth entry , re-entry and departure to/from Cambodia for the Japanese technical staff (8) Preparation of temporary office - Renovation of existing ward buildings and construction of temporary buildings - Movement of equipment from existing buildings to the temporary office (9) Installation of General Furniture (10) All the expenses, other than to be born by Japan's Grant Aid within the scope of the Project

3-1-4 Consultant Supervision

The scope of the supervision works by Consultants during the construction phase is as follows:

(1) Check and approval of the construction plans and drawings

To check and approve the construction plans, construction schedules, shop drawings, materials, samples, equipment list and specifications, etc. submitted by the Contractor.

(2) Management of the construction schedule

To give instructions to the Contractor and review the progress report submitted by the Contractor in order to complete the construction work as scheduled. In the event that the construction work being carried out by the Government of Cambodia is delayed, the Consultant may urge a faster schedule for the construction work.

(3) Quality control

To check and give approval for the quantity of materials and construction works in accordance with the specifications. However, the materials and equipment which are imported from Japan or the third countries will be checked by architects and engineers in the head office or branch offices of the Consultant.

(4) Check of the finished product

To check the finished products and confirming the quantity.

(5) Assistance with payment procedure and issuance of certificates

To assist with the procedures of checking bills, etc., relating to the payment of construction expenditure and issuance of certificates such as the certificate of practical completion, the completion certificate, etc., if necessary.

(6) Check and submission of monthly progress reports

To check and approve monthly progress reports, completion documents and photos of works from the contractor and to report the progress of the construction work to the Government of Cambodia and JICA.

The Consultant shall also prepare and submit the completion report in accordance with the Grant Aid Program guidelines to the Japanese Government.

(7) Others

To manage and coordinate the schedule and works, if necessary, in order to achieve smooth integration with the works executed by the Government of Cambodia.

3-1-5 Procurement Plan

(1) Procurement Plan for Construction Materials

The procurement plan is prepared on the basis that the building materials available in Cambodia are very limited. Materials which can be procured in Cambodia are sand and stone, bricks, ventilation blocks, etc. Concrete will also be available from the central batching plant in Phnom Penh (5km distance from the site).

Most of the other materials, such as reinforcing steel bar, structural steel, ceramic or porcelain tiles, windows, etc. must be procured outside Cambodia, in consideration of the quality and quantity. Most materials will be procured from Thailand due to the short transportation route, although procurement from other countries, such as Malaysia and Singapore, should also be considered. Procurement of waterproofing material, neutralizing tank and incinerator should be made in Japan.

When procuring materials for the Project, it is necessary to select those which facilitate good maintenance. In addition the procurement period and the transportation procedure must be carefully investigated.

It is proposed that materials used in this project will be procured from the locations as shown in Table 3-2.

Table 3-2 Procurement of Construction Materials

Name of material	From Cambodia	From Japan	From Third Country	Remarks
[Bldg. work]				
Sand/Gravel	○			
Cement	○			
Bricks	○		○	
Timber	○	○		
Re-bar	○		○	
Concrete Blocks	○			
Tiles	○	○	○	
Wood Fittings		○	○	
Metal Fittings		○	○	
Waterproof Agent		○		
Roof Tile	○		○	
Plastic Tiles	○			
Ceiling Board			○	
Paint	○		○	
Miscellaneous Hardware			○	
[Elec. work]				
Distribution Panel Board			○	

Name of material	From Cambodia	From Japan	From Third Country	Remarks
Lighting Appliances			○	
Electric Cable/Conduit			○	
Wiring Equipment	○		○	
Control Panel			○	
Generator			○	
[Mech. work]				
PVC pipes			○	
Sanitary Fixtures			○	
Elevated Reservoir Tank			○	
Pumps			○	

Table 3-3 Procurement of Construction Equipment

Name of equipment	From Cambodia	From Japan	From Third Country	Remarks
Backhoe shovel (0.6m^3)	○			
Track (4t)	○			
Vibrating roller	○			
Rammer	○			
Compactor	○			
Re-bar Cutter	○			
Re-bar Bender	○			
Concrete Mixer	○			
Generator (3.5KVA)	○			
Generator (2.2KVA)	○			
Electrical Welder	○			
Tanker	○			
Scaffolding frame	○			
Batcher Plant	○			

(2) Procurement Plan of Equipment

1) Procurement in Cambodia

It is planned to procure photocopier, computers and related peripheral devices from local agents or local distributors, taking into consideration after-sales service and maintenance. Both Khmer language and English language typewriters will be required to prepare official documents to the Ministry of Health, and to fill out various forms for the World Health Organization. It is anticipated that these will be procured from local sources.

Some of the training equipment (which are equivalent to Japanese-made home appliances) can be purchased in Phnom Penh at a competitive price. This equipment includes (but is not limited to) television and video tape recorders which can playback both PAL and NTSC format tapes. Purchase may therefore be made from local sources.

2) Procurement in Japan

It is planned to procure equipment such as X-ray diagnostic equipment , incubator, and laboratory tables in Japan.

3) Procurement in third countries

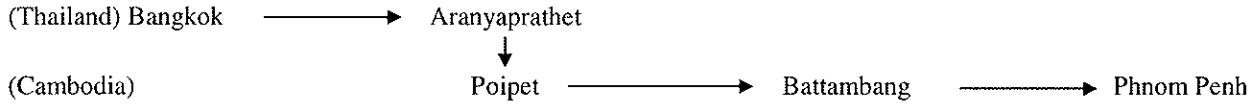
Some of the basic equipment which will be procured for this project, such as automatic X-ray film processor, are available from agents or distributors of Japanese manufacturers in Thailand and/or Singapore. These agents have generally established a good service organization by training service engineers and keeping sufficient spare-parts, since they have already sold fairly large numbers of the equipment in their marketing territory. Therefore, it may be preferable to purchase this equipment from the third countries rather than from Japan taking into consideration the long-term after-sales service.

(3) Transportation Plan

As mentioned above, most of the materials and equipment for construction are considered to be procured from outside of Cambodia. The Transportation Plan should be studied in consideration with the Construction schedule.

1) Transportation by land

Materials or equipment procured from Thailand and Vietnam can be transported by land. The transportation route from Thailand is shown as follows, and it takes 4 – 10 days in the dry season. However, in the rainy season, it might take almost one month because of the poor road conditions.



In this case, transshipment of freight is required at the border line. Freight over 2t/pack are charged additionally due to the use of a special crane. Transportation by land is too risky, because in addition to the bad road condition in the rainy season, the trucks have been robbed, and insurance companies will not insure freight transported by land from Thailand to Phnom Penh.

2) Transportation by sea

There are two routes for transportation by sea, one from Shihanouk Ville Port, and the other from Phnom Penh Port. Though Phnom Penh Port is closer to the site, only Shihanouk Ville Port has a facility for landing of containers, and therefore this

port will mainly be used. The procedure for customs clearance at the port takes almost one week.

The schedules and expected transportation routes are described as follows:

A) Bangkok —(1 - 2 times/week, 14 days)→ Shihanouk Ville Port —(By land, 1 day)→ Project Site (Total days)

B) Bangkok —(2 times/week, 3 days)→ Singapore —(2 times/week, 3 days)→ Shihanouk Ville Port —(By land, 1 day)→ Phnom Penh

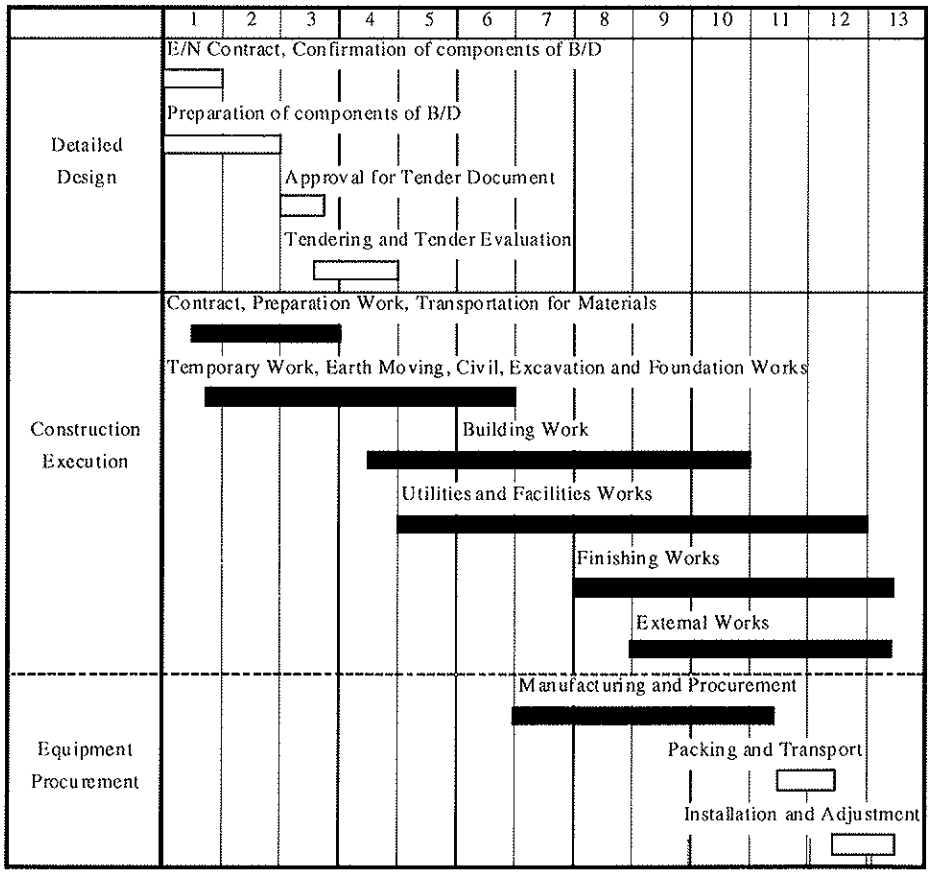
C) Singapore —(2 times/week, 1 week)→ Phnom Penh Port —(By land)→ Phnom Penh

From the view point of safety, road condition, procedure for customs clearance, and period required, transportation by sea will be the main transportation route for this project.

3-1-6 Implementation Schedule

The tentative implementation schedule for the Project is as shown in Table 3-4.

Table 3-4 General Project Schedule



3-1-7 Obligation of Recipient Country

In the M/D signed on 9th of April, it was confirmed that the recipient country is required to undertake such necessary measures as the followings in the implementation of the Project.

a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.

b) to provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.

c) To secure buildings prior to the procurement in case of the installation of the equipment.

d) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.

e) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts.

f) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

g) To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid.

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

3-2 Operation and Maintenance Plan

3-2-1 Operational Body

(1) Project Implementing Agencies

The Ministry of Health, the Kingdom of Cambodia is the Responsible Agency for the administration of the Project. The National TB Center (CENAT), which is the Implementing Agency of the Project, is under the Department of Preventive Medicine.

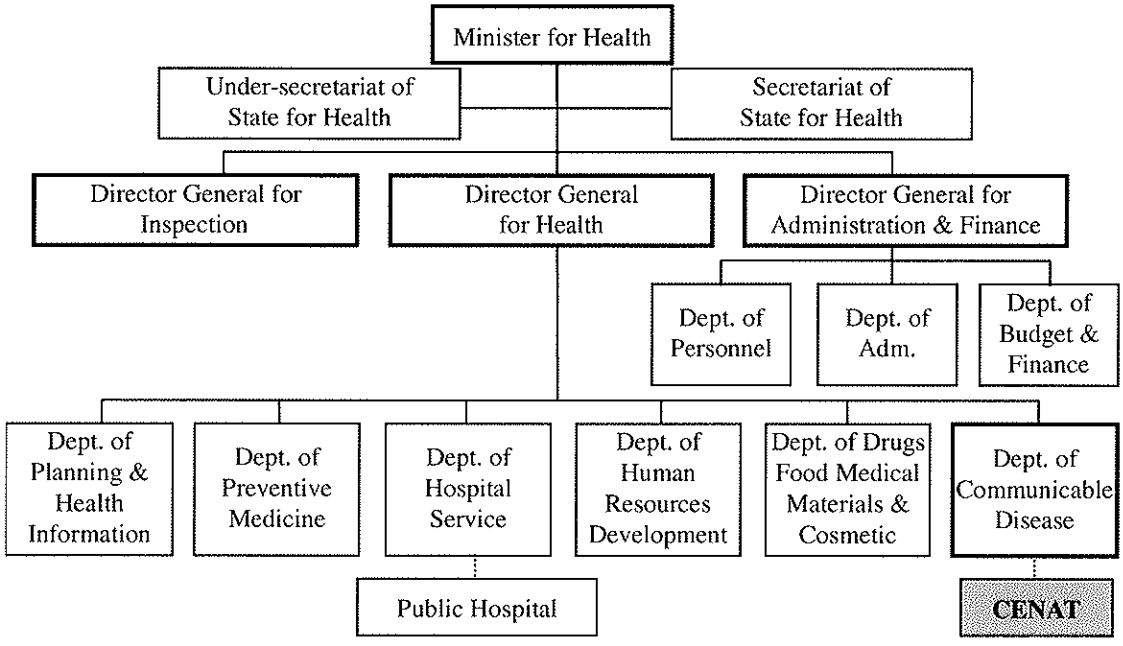


Fig. 3-2 Organization of the Ministry of Health

In order to implement and proceed this Project smoothly, a Working Committee consisting of seven members was established.

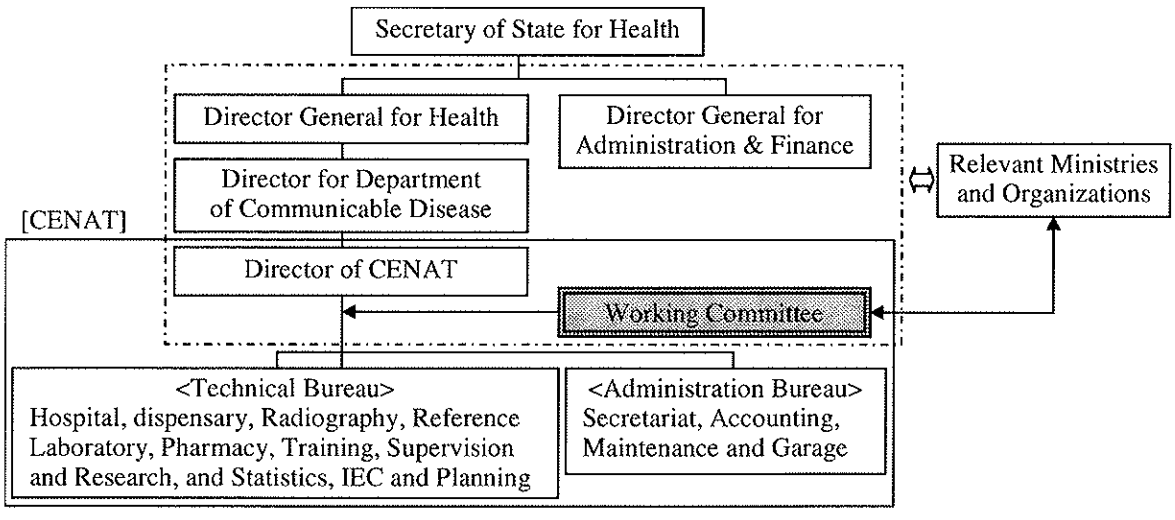


Fig. 3-3 Working Committee for the Project

The Working Committee is composed of doctors from the Technical Bureau and staff from the Administration Bureau, and one engineer assigned as a coordinator from the Bureau of Material Management, Government Property, Construction of MOH. In order to make prompt decisions and smooth procedure, the Director of CENAT, the Director General for Health, and the Director General for Administration & Finance will support this Working Committee as advisors.

(2) Facility Management Organization

After the completion of this project, the new buildings will be operated by CENAT itself.

1) Management and Operation Organization

The present organization chart of CENAT is as shown below. Under the chief and vice chief, it is divided into two bureaus, the Technical Bureau and Administration Bureau. The Technical Bureau covers the Medical Service, and the Research Medical Service, whilst the operation and management will be under the control of the Administration Bureau.

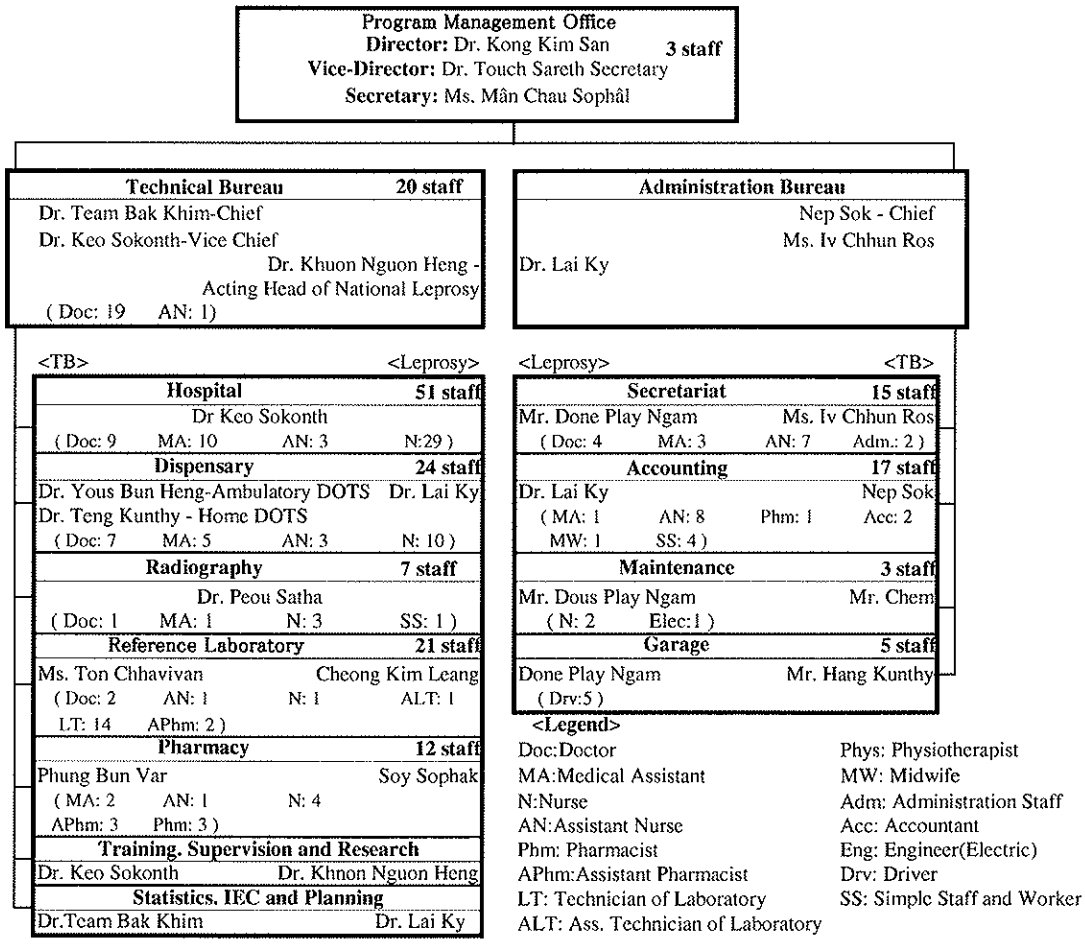


Fig. 3-3 Organization Chart of CENAT

From 1996, 40 out of 184 staff have been involved in the Hansen Disease Project. However, they will be integrated into one organization for TB control after the completion of the Hansen Project, in two years time.

Staff are assigned to the section shown in the Organization Chart, but Training, Supervision and Research Section, and Statistics, IEC and Planning Section are covered by all staff.

The chief of each section takes control of their activity. All sections are under the direct control of the Director.

In order to expand and strengthen their activities, a more systematic and structured organization is required.

2) Number of Staff Members

The present staff numbers and plans for an increase of staff are explained below. The present number of staff is 185, which will be increased to 200 in 2001. The number of Doctors will be increased by ten to strengthen the statistics & planning section and laboratory section.

Table 3-5 Present and Future Staff Numbers

	Present (1999)	2000	2001	Future 2001
Doctor	45	4*1	6*2	52
Medical Assistant	19			22
Nurse	65		1*3	66
Assistant Nurse	8			9
Midwife	1			1
Technician of Laboratory	14			14
Ass. Technician of Laboratory	2			1
Pharmacist	5			5
Assistant Pharmacist	4			4
Physiotherapist	4			4
Administration Staff	2			2
Accountant	2	1	1	4
Engineer(Electrician)	1		2	3
Driver	5			5
Simple staff and Worker	8			8
Total	185	5	10	200

(Note) *1: 1 Doctor for Hospital Section, 1 Bacteriologist for Laboratory, 2 Researchers for Technical Bureau
*2: 2 Doctors for Hospital Section, 1 Bacteriologist for Laboratory, 3 Researchers for Technical Bureau
*3: 1 Radiologist

The number of Medical, Technical and Administrational staff of CENAT appears to be sufficient, however there are a limited number of staff for maintenance of facilities and equipment. An increase of technical staff is required.

(3) Budget

1) Current Condition

The past and present budgets of MOH and CENAT are shown in the following table. The fiscal year in Cambodia is from January to December. The budget for CENAT is determined based on the estimation prepared by CENAT and the adjustment by MOH.

a) Budget for MOH

As seen in Table 3-6, the budget of MOH has increased gradually. However the rate of consumption of the budget has been limited to 60-80% of the total budget, because of the national financial difficulties.

Table 3-6 Expenditure of MOH

(Unit : US$)

items	1996		1997		1998	
	Budget	Expenditure	Budget	Expenditure	Budget	Expenditure
Salaries	11,985	8,992	11,065	9,826.70	12,160	10,265.52
Operating costs exc. drugs	23,228	13,602	23,931	11,230.00	21,496	11,764.40
Drugs and medical supplies	22,422	18,644	23,069	21,094.30	25,260	20,505.75
Agreement ADD	2,040	591	2,040	598.80	2,640	439.82
Social allowances	615	184	640	185.80	808	545.59
International Organizations	110	109	-	-	-	-
Sub-total (1)	60,400	42,122	60,745.00	42,935.00	62,364.00	43,551.00
Investment-construction & equipment	11,600	225	9,124.40	9,124.40	672.42	672.42
Investment-counterpart contribution to loans	625	366	1.20	1.20	1,382.60	1,382.60
Sub-total (2)	12,225	591	9,125.60	9,125.60	2,055.02	2,055.02
Total (Consumption Rate)	72,625	42,713 (58.81%)	69,870	52,061.20 (74.51%)	64,419	45,600.09 (70.79%)

(Source: Dept. of Budget & Finance)

Future budget for MOH is shown in Table 3-7. This is estimated based on the assumption that the rate of inflation is 15%. Also it is planned that the percentage of Health Budget to GDP will increase from 0.57% in 1998 to 2.01% in 2002. However more than 20 percent of the funding gap still remains.

Table 3-7 Future Budget for MOH

(Unit: 1,000US$)

Items	1999	2000	2001	2002
Salaries	4,981	9,788	18,432	27,034
Operation cost exc. drugs	21,873	26,925	35,568	45,602
Drugs and medical supplies	16,089	18,676	24,199	28,132
Others	4,316	11,478	11,706	12,056
Investment (Building equipment)	75,682	78,002	76,115	80,523
Total	122,761	144,239	166,020	193,347

(Source: PIP 2000-2002)

b) Budget for CENAT

As for CENAT, the total budget has been increased with the nationwide development of DOTS. The 1999 budget is estimated to be 1.3 times of the 1998 budget.

However, CENAT's budget consists of several budget items. Most of CENAT's budget is used to pay staff salaries, and operation and maintenance cost is paid from the MOH Budget.

Some items like Electricity supply, Water supply and Telephone charge are paid by MOH directly, depending on the consumption, even though it should be within the budget requested by CENAT. Some other items like fuel oil for generator and incinerator and vehicles, medical gas, and detergent, are bought in bulk by MOH for all health facilities and distributed to each facility. The drugs for TB are supplied by the WB.

It is very difficult to forecast the future budget based on the change of expenditure in the past few years, because of the lack of accurate records. However, the total budget of MOH in 2000 is expected to increase by 66% due to a cutback in the military budget.

Table 3-8 Budget of CENAT

(Unit : Riel)

Items	1996 (Expenditure)	1997 (Expenditure)	1998 (Expenditure)	1999 (Budget)	2000 (Budget)
Salaries & Allowances	72,633,125 48.22%	120,390,996 33.27%	170,736,492 29.21%	157,068,960 14.44%	173,900,000 12.98%(14.15%)
Operating cost	2,780,000 1.85%	27,932,000 7.72%	308,144,222 52.71%	340,842,100 31.35%	425,800,000 31.79%(34.64%)
Maintenance cost	20,780,000 13.79%	80,000,000*1 22.10%	7,776,000 1.33%	235,635,800 21.67%	332,000,000 24.79%(27.01%)
Transportation / Social welfare	7,977,600 5.30%	2,046,000 0.57%	9,788,280 1.67%	88,599,000 8.15%	30,000,000 2.24%(2.24%)
Running cost (Gas, Tel., etc.)	46,442,633 30.84%	131,509,752 36.34%	88,118,350 15.07%	265,241,800 24.39%	267,600,000 19.98%(21.77%)
Others (Cambodian Side Work, etc.)					110,000,000 7,21%
Total	150,615,354	361,878,748	584,563,344	1,087,389,659	1,339,302,000

(Source: Department of Budget and Finance, MOH)

1 Source: Expenditure of 1996 – 1998 was prepared by Department of Budget and Finance, MOH Budget for 1999 and 2000 approved budget by MOH.

2 *1 Estimated number because of lack of data.

*2 Maintenance Cost for Buildings, Equipment and vehicles

*3 Running Cost for Electricity, Water, Telephone, Gas, Medical Gas, and fuel for Generator, etc.

3. Percentage with ( ) is percentage of budget for each item to total budget except budget for Cambodia Side Work.

As for running cost of budget in 2000, estimation of running cost for the new buildings constructed by this project, which was presented by the Study Team, is taken into account. Though this amount is almost three times the expenditure in 1998, the percentage of the Budget of 2000 is less than that of 1999, as a result of revised Utility plan to reduce the running cost. However, this project will be completed in March 2001, and the budget for running costs in 2000 is only for the new buildings, exclulding Ward buildings. It was requested to and confirmed by MOH that sufficient budget required for operating the new buildings shall be prepared after 2001.

c) Budget for TB Control

Table 3-9 shows the budget for all TB control activities under MOH, which is described in the Public Investment Program 2000-2002. However, these are only projections of the required budget, and it is expected that only approximately 40% of this required budget will be available. It means that donor funding is required for the remaining 60% of the projected budget.

Table 3-9 Budget of TB Control

(Unit : US$)

Items	1999	2000	2001	2002
Salaries & Allowances	60,000	41,000	57,000	63,000
Operating	37,000	123,000	136,000	149,000
Medicine & Medical	832,000	898,000	1,002,000	1,138,000
Construction/Repair	50,000	150,000	50,000	
Equipment • Furniture	80,000	71,000	73,000	75,000
Training	112,000	293,000	317,000	337,000
Others	1,251,000	1,295,000	1,198,000	1,365,000
Total	2,422,000	2,871,000	2,833,000	3,127,000

(Source: PIP 2000-2002)

The items of Salaries & Allowance, Construction/Repair, Equipment and Furniture are only for CENAT, and other items cover TB control activities for the entire country.

The WB program for TB control is a five year project, and is planned to finish in 2001. It will be decided whether it will be continued or not, based on the evaluation result of the Midterm Review which will be carried out in December 1999, and Final Review which will be held at the final stage of the project.

2) Future subject

MOH has recommended that health facilities introduce the user fee system, and some of the hospitals have started to get income through the sale of medical services. However, it is very difficult for CENAT to obtain income in a similar manner, because in principle, the treatment of Tuberculosis should be free of charge.

Patients will be sent from private clinics or other health centers for some of the X-ray and Laboratory examinations. The possible introduction of a user fee system to patients (except for TB patients) is under discussion. It is expected to obtain some income from these services in the future.

3-2-2 Operation and Maintenance Plan

(1) Maintenance and Management Plan for Facility

The Bureau of Material Management, Government Property, Construction, which is under the Department of Budget and Finance in the organization of MOH,, takes charge of MOH's property. The section for Construction of Health Buildings is in the Bureau, and staffed with 1 civil engineer, 1 architect and 2 cost engineers. These staff are responsible for the supervision of the preparation of drawings, evaluation of prequalification in the tendering process, and supervision of construction work.

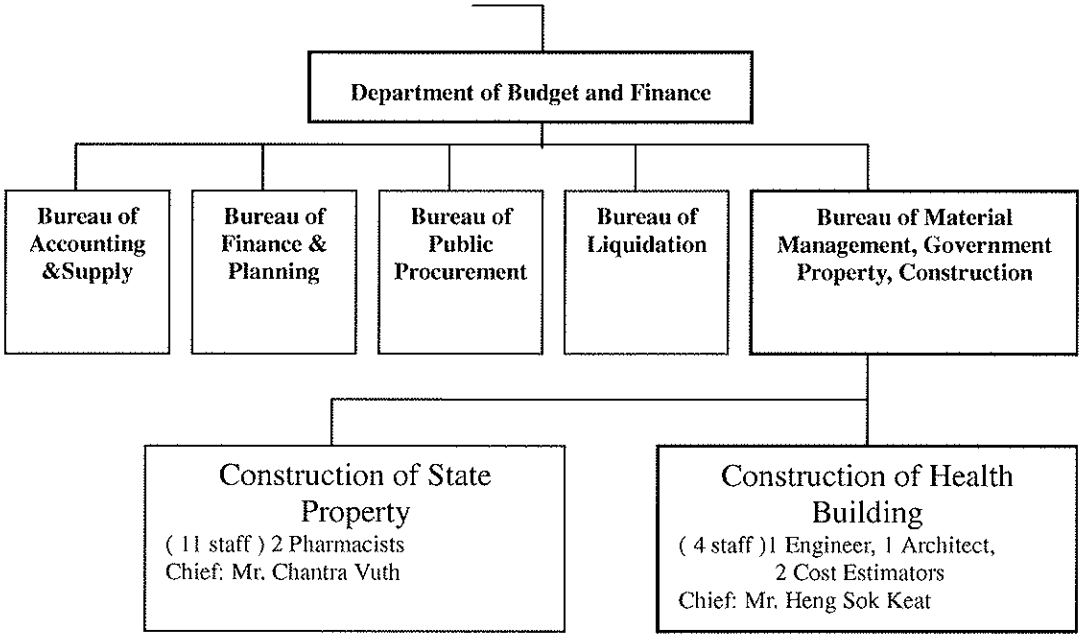


Fig. 3-5 Organization of the Department of Budget and Finance

Except for minor maintenance which is done by the electrical technician (the only engineer in CENAT), the facilities and equipment in CENAT have not been maintained. Damage, such as broken windows and peeling floor tiles are left without repair.

As a result of this situation, it was suggested that the number of engineers is increased in the MOH to maintain the health facilities and equipment. For CENAT, it was also requested to employ some engineers for maintenance after the completion of this project. It is planned that two more electrical engineers will join CENAT. However, plumbing and mechanical engineers are also required.

As one of the components of the Cambodia Disease Control and Health Development Project, and Basic Health Service Project, which are implemented by the Project Coordination Unit (PCU) supported by WB and ADB respectively, a new project to establish a maintenance system for hospitals and health facilities under MOH has been started in September 1999. In this project, two or three persons per each facility are

assigned as person in charge of maintenance. From CENAT, three members have been assigned and they attended the seminar.

(2) Maintenance and Management Plan for Equipment

1) System of Maintenance and Repair

HEP-Extension (Hospital Engineering Project-Extension) was established in Cambodia by the Red Cross in 1993, with the aim to maintain and repair medical equipment in MOH hospitals in Phnom Penh.

The Medical Engineering Center (MEC), supported mainly by the Australian Organization, AusAID, has more than 10 engineers. The engineers are trained in France, Australia, Singapore and Thailand. They mainly cover MOH hospitals which are located within 120km of Phnom Penh. Maintenance and repair of X-ray equipment, ultrasound equipment, etc., is performed on a chargeable basis.

Depending on the manufacturer and model of medical equipment, there are differences in the methodology of maintenance and repair, and also in the availability and acquisition of spare parts. But we are of the opinion that the primary service center, such as MEC in the vicinity of CENAT should be utilized.

In order to implement this project, CENAT must relocate all of its existing equipment to a temporary site, and relocate it again when the new building is completed. The expense of these moves has to be borne by CENAT. Movement of the large-sized equipment like the X-ray diagnostic unit are going to be the most difficult. It might be possible to invite a supervisor from MEC (estimated cost: 5 days x $100/day = $500) to assist with this work. Although CENAT has not asked MEC for their services in the past, there is now the opportunity to make full use of their capabilities.

Regarding maintenance of photocopiers, warranty conditions include free maintenance service for three years (not including consumables). The photocopiers currently owned by CENAT have been maintained accordingly in this manner.

Computer systems, in general, have a three-year warranty with on-call services. However, regarding the computers which were recently bought by CENAT using a World Bank Loan, both the models and the dealers were selected by the Ministry of Health. The computer systems have not been getting good after-sales service. This reinforces the philosophy that reliable dealers or distributors have to be selected.

2) Maintenance and Operating Expenses

X-ray films of 35 cm x 43 cm (14" x 17") size at a cost of approximately US$ 1.00 per sheet are one of the essential consumables. However, most of the consumables for anti-tuberculosis activities, such as X-ray films, film developing fluid, fixing solution, drugs, reagents and so on are supplied by the Ministry of Health. Therefore, provided that there is no sudden and unexpected increase of non-tuberculosis patients, there will not be any additional operating expenses due to the Project.

In the past CENAT has used considerable quantities of paper for production and photocopying of training materials and quarterly reports. It is reported that CENAT has recently started to place an order for printing and binding of the reports with an outside company. The provision of a new printing machine will enable CENAT to carry out this work at a lesser cost.

Same as the maintenance for facilities, PCU has a plan to establish a maintenance system for medical equipment, and the Development Policy and Guideline has been prepared. It is planned to start in February 2000.

Furthermore, one project to strengthen the maintenance system in provincial hospitals has been ongoing. In the project, two of the staff of the provincial hospitals are under training in MEC Red-Cross.

As shown above, MOH has began to establish and strengthen the maintenance system. However, daily maintenance for equipment should be done by CENAT itself, and establishment of a daily maintenance system in CENAT is required.

(3) Utility Running Cost / Project Budget for Utilities

The Utility Running Costs have been analyzed in order to review the Breakdown of Expenditure proposed by CENAT. The results are as follows:

The running costs for the utilities for the proposed facilities were estimated as follows by assuming demand factors based on the existing conditions: (the exchange rate: 1US$ = 3,800 Riel)

1) Electricity Costs

According to the standard rates of the Public Electric Power (EDC:Electricitè du Cambodge) in Cambodia, electricity costs for the new facilities were estimated as follows:

Category of Electricity Costs

①Housing: 350 Riel/kwh
②Factory: 650 Riel/kwh
③Government: 700 Riel/kwh
④Hotel: 800 Riel/kwh

Basic Service Rate: 0 Riel/kwh month (Basic Service Rate is unnecessary)
Standard Rate(Government) : 700 Riel/kwh

The contract demand was assumed to be 170kw

The rate for the contract will be as follows:

Basic Service Rate : 0 Riel/kwh month (Basic Service Rate are unnecessary)
Service Rate : 170kw × 276 days (schedule per year) ×7hr(schedule per day)
× 700 Riel/kwh = 229,908,000 Riel/yr
Estimated total electricity costs for the new facilities = approximately 230,000,000Riel/yr
→ approximately 60,600 US$

The amount allocated for 1997 (Report from CENAT; 69,521,750Riel/yr. → approximately 18,300US$/yr.). The project expenditure on completion of the Project is approximately 3.3 times this sum. Therefore CENAT must apply for and acquire the necessary funds from the Government of Cambodia.

<Works to be carried out by the Cambodian Side>

Extent of Electrical Works

① Relocation of Substation (building, system etc.):approximately 35,000 US$

② Connection Charge ：3ph × 500A × 4US$/A=6,000 US$

③ Consumer Deposit：3ph × 500A × 5,250 Riel/A =7,875,000 Riel (→ 2,100US$)

④ Cable Work : 120m × 2 × 25 US$/m = 6,000 US$

⑤ VAT(10%):(ConnectionCharge+ConsumerDeposit)×10%=600US$+787,500Riel
→ 600US$+210US$ = 810US$

Total (① ～ ⑤) : 49,910US$ → approximately 50,000US$

The above items (① ～ ⑤) should be paid to EDC. Budgets should be applied for and acquired from the Government of Cambodia .

2) Water Costs

The estimated daily water use at the new facilities is 30m^3/day. According to the standard rates of Phnom Penh Water Supply Authority (PPWSA), the cost of water is calculated as follows:

Category of Water Tariff

①Domestic

0 m^3 – 15 m^3/month:	300 Riel/m^3
16m^3 – 30 m^3/month:	620 Riel/m^3
31m^3 – 100 m^3/month:	940 Riel/m^3
101m^3 and more per month:	1,260 Riel/m^3

②Government buildings: 940 Riel/m^3 (fixed amount, not related to quantity)

③Commercial, Industrial, Private sector:

0m^3 – 100 m^3/month:	940 Riel/m^3
101m^3 – 200 m^3/month:	1,260 Riel/m^3
201m^3 – 500 m^3/month:	1,580 Riel/m^3
501m^3 and more per month:	1,900 Riel/m^3

Monthly water use:	30m^3/day x 23 days/month	= 690m^3/month
	690m^3 x 940 Riel/ m^3	= 648,600 Riel/month
Drainage Water Rate:	648,600 Riel/month x 10%	= 64,860 Riel/month
Basic Service Rate (Admin, Tax, Service equipment charge):		0 Riel/month
	Total:	713,460 Riel/month

Estimated water costs per year: 713,460 Riel/month x 12 month/yr = 8,561,520 Riel/yr

The estimated total water use costs for the new facilities = approximately 8,600,000Riel/yr
→ approximately 2,300 US$/yr

The estimated water use costs after Project completion is approximately 1.3 times the past budget based on the amount allocated for 1998 (MOH Report: 6,786,600 Riel/yr → approximately 1,800 US$/yr). Therefore, CENAT must apply for and acquire the necessary funds from the Government of Cambodia.

<Works to be carried out by the Cambodian Side >

Extent of Water Supply Works

Connection Charge + Consumer Deposit + VAT(10%): 950 US$

The above should be paid to PPWSA upon contract with PPWSA. Such budget should be applied for and acquired from the Government of Cambodia.

3) Telephone Costs

Based on the standard rates of Ministry of Posts and Telecommunication (MPTC), the telephone cost was estimated as follows:

①Basic Service Rate per line: 13 US$ / month･line

②Service Rate per call:

a) Local Calls ： 1 Cent/min

b)Long Distance Calls ： 30 Cent/min

c) International Calls ： International Call rates are set for three different areas.

- Asia area I (Vietnam, Thailand, Laos): (Weekday) 2.4US$/min
  (Saturday, Sunday) 1.9 US$/min
- Asia area II (Japan,): (Weekday) 2.6 US$/min
  (Saturday, Sunday) 2.0 US$/min
- Europe, USA area: (Weekday) 2.9 US$/min
  (Saturday, Sunday) 2.3 US$/min

Calls were assumed as follows.

Local Calls	: Local Calls I, estimated at 5 min. per call with 15 calls per day.
Long Distance Calls	: Long Distance Calls I, estimated at 5 min. per call with 10 calls per day.
International Calls	: Available time in CENAT is week-day only. -International Calls Asia area I, estimated at 2 min. per call with 1 call per 2days. -International Calls Asia area II estimated at 2 min. per call with 1 call per 4days. -International Call Europe, USA area estimated at 2 min. per call with 1 call per month.

Thus, the telephone cost was calculated as follows:

Local Calls : 1Cent/min. x 5min. x 15calls/day x 23days/month
= 1,725 Cent/month → approximately 18US$/ month

Long Distance Calls : 30Cent/min x 5min x 10calls/day x 23 day/month
= 34,500 Cent/month → approximately 345US$/ month

International Calls : (Asia area I) 2.4 US$/min. x 2min. x 1call/2days x 23days/month
=55.2 US$/month
(Asia area II) 2.6US$/min. x 2min. x 1call/4days x 23days/month
=29.9 US$/month
(Europe, USA area) 2.9US$/min. x 2min. x 1calls/month
=5.8 US$/month

Basic Service Rate : 13US$/month·line x 3 lines=39US$/month

Total Cost per Month: 492.9 US$/month

Total Cost at CENAT per year:492.9 US$/month x 12 months/year=5,914.8US$/yr.

Estimated total telephone costs for the new facilities = approximately 6,000US$/ yr.

The estimated telephone costs for CENAT after Project completion is approximately 23 times the past budget amount allocated for 1997 (Report from CENAT; 957,892 Riel/ year →approximately 260US$/yr). Therefore, CENAT must apply for and acquire the necessary funds from the Government of Cambodia.

<Works to be carried out by the Cambodian Side >

Extent of Telephone Works

①Connection Charge:

Domestic Line : 240 US$/line

International Line: 380 US$/line (including Consumer Deposit 140US$/line)

Thus, 240 US$/line × 2 lines (Domestic) = 480 US$

380 US$/line × 1 line (International Line) = 380 US$

Assumption of Total; 860 US$

②VAT(10%): 0 US$ (Basic Service Rate is unnecessary)

The above items(①~②) should be paid to MPTC upon contract with MPTC. Such budget should be applied for and acquired from the Government of Cambodia.

4) Fuel Costs

For the emergency electric generator and the incinerator, diesel fuel will be used. Fuel cost is 1,130Riel/liter.

① Emergency electric generator

Operation time was assumed as follows.

a) 7:30～17:00: 150KVA- Generator Model, and 25KVA- Generator Model (is standing by 9 hours)

b) 7:30～7:30: 25KVA- Generator Model only (is standing by 24 hours)

Thus, the fuel cost was calculated as follows:

a) Rainy Season (May-October): Assuming one 10 hr(day time:5hr, night time:5hr) power outage a week;

150 KVA, TYPE : 50 l/hr. × 26 times/Rainy Season × 5h × 1,130 Riel/liter = 7,345,000 Riel/ Rainy Season

25 KVA, TYPE : 6 l/hr×26 times/ Rainy Season×(5h + 5h)× 1,130 Riel/liter = 1,762,800 Riel/ Rainy Season

b) Dry Season (November-April): Assuming one 3 hr(day time:2hr, night time:1hr) power outage a week;

150 KVA, TYPE : 50 l/hr. × 26 time/Dry Season × 2hr × 1,130 Riel/liter = 2,938,0000 Riel/ Dry Season

25 KVA, TYPE : 6 l/hr × 26 times/Dry Season×(2hr +1hr)× 1,130 Riel/liter = 528,840 Riel/Dry Season

Sub-total Fuel Costs:12,574,640 Riel/yr

The estimated fuel costs for the emergency electric generator = approximately 13,000,000Riel/yr→①approximately 3,500US$/yr

② Incinerator

The fuel cost was calculated as follows

Assuming 3hr. a week;

7.6 l/hr×52times/yr.×3h× 1,130Riel/liter=1,339,728 Riel/ yr.

Sub-total Fuel Costs:1,339,728 Riel/yr

The estimated fuel costs for the incinerator = approximately 1,340,000Riel/yr → ②approximately 350US$/yr

Thus, total fuel costs for the emergency electric generator and the incinerator = ①+② =3,850US$/yr

The estimated total fuel costs for the emergency electric generator and the incinerator is 4,090 US$/yr (① + ②). The past budget amount allocated for fuel in 1997 (Report from CENAT) is 24,028880Riel/year (→ approximately 6,400US$/yr). Therefore, CENAT's estimated budget for fuel should be sufficient.

5) LPG Costs

For the laboratory, propane gas (LPG) will be used.
LPG cost is 0.5 US$/kg.

The consumer deposit and the rental fee for LPG cylinder should be paid to the LPG supplier.

LPG cost for the laboratory is estimated at 4 hours per day with a capacity of 0.3 kg/hour.

① (0.3 kg/hour × 10) × 3 h/day × 0.5US$/kg × 23 day/month × 12 month/ year × 0.8(operation rate) = 994 US$/yr

② Consumer deposit for LPG cylinder :30US$ (1 time only)

③ Rental fee for LPG cylinder :3US$/month × 12month/yr.=36US$/yr.

Total LPG Costs (①+②+③): 1,030 US$/yr

Estimated total LPG costs for laboratory = approximately 1,000US$/ yr.

The estimated LPG costs for the laboratory after the Project completion is approximately 3.4 times the past budget based on the amount allocated for 1997 (Report from CENAT; 1,080,000Riel/year → approximately 290US$/yr). Therefore, CENAT must apply for and acquire the necessary funds from the Government of Cambodia

6) Laundry Soap Cost

Laundry soap will be used in the laundry room
Laundry soap cost is 4,000Riel/kg.

Soap cost for the laundry is estimated at 4 hours per day with a capacity of 0.2 kg/hour.

(0.2kg/h × 3) × 4h/day × 4,000Riel/kg × 23days/month × 12months/yr. × 0.8(operation rate) =2,119,680 Riel/yr

Estimated soap cost for laundry = approximately 2,120,000 Riel/yr
→approximately 600US$/yr

The estimated laundry soap cost is 600 US$/yr. The past budget amount allocated for 1997 (Report from CENAT) is 9,935,640Riel/year (→ approximately 2,700US$/yr). Therefore, CENAT's estimated budget for soap should be sufficient.

7) Summary of Utility Running Costs

As stated above, estimated utility costs are summarized as follows:

1) Electricity Expenses:	230,000,000Riel/yr →	approximately 60,600US$
2) Water Expenses:	8,600,000Riel/yr →	approximately 2,300 US$/yr
3) Telephone Expenses:		approximately 6,000US$/ yr.
4) Fuel Expenses:		approximately 3,850US$/yr
5) LPG Expenses:		approximately 1,000US$/ yr.
6) Soap Expenses:	2,120,000Riel/yr →	approximately 600 US$/yr
Total Estimated Utilities for 1)~6):		approximately 74,350US$/yr

The above Total Utility Costs will be 3.2 times more than the budget of 88,118,350 Riel/yr (→ approximately 23,200US$/yr) allocated for 1998 (MOH Report). This budget amount was agreed to by MOH, CENAT during the Draft Final Explanation Study.

CHAPTER 4
PROJECT EVALUATION AND RECOMMENDATIONS

CHAPTER 4 PROJECT EVALUATION AND RECOMMENDATIONS

4-1 Project Effect

The construction of the new facilities and the procurement of TB diagnostic and training equipment for CENAT through the Project is expected, in cooperation with PTTC, to strengthen the TB control activities of NTP in Cambodia.

CENAT has several functions in its role as a center for TB Control in Cambodia, such as policy making, training, research, monitoring, and diagnosis and treatment. The Project aims to improve the facilities and equipment used for all those purposes, with the exception of inpatient treatment facilities.

(1) Direct Effect

As mentioned above, the Project will support the activities of the PTTC, which aims to provide a nationwide quality TB control services with DOTS strategy which is recommended by WHO under the new health service structure. In cooperation with the PTTC, the implementation of the Project is expected to realize the following improvement:

1) Diagnosis and Treatment: CENAT is the top referral facility for TB treatment in Cambodia. It receives approximately 4,000 patients per year, including around 800 new cases, some of whom are referred from other hospitals and clinics from entire Cambodia.

   Through the completion of the Project, the diagnostic and treatment functions of CENAT will be strengthened. The Project will play a significant role in improving the medical service for TB control in Cambodia, and all TB patients in Cambodia (approximately 17,100 patients per year) will benefit.

2) Training: Through the implementation of the Project, the function of training in CENAT will be improved, and the technical skill of the health personnels involved in TB control will be upgraded. In CENAT, almost 20 training programs (approximately 13 courses) including training for staff and laboratory technicians in TB units, doctors and nurses working in NGO and private clinics are planned to be carried out after the completion of the Project, and it is expected that approximately 5,000 people are expected to attend the training courses. In consequence, the Project will improve the quality and the capacity of examination, diagnosis and treatment of the TB Units (145 units in 1999) in Cambodia by improving and

upgrading the skill and knowledge of persons in charge of TB control activities (approximately 930 persons in 1998). In addition, the strengthening of the capacity of supervisors for TB control is also expected to reinforce the activities of the TB Unit.

3) Research: Research is one of the essential roles of CENAT as a National Laboratory, including forefront research activities regarding culture and drug susceptibility examinations, etc. Strengthening CENAT's research activities through the Project will also support its policy making function.

Completion of the Project will strengthen surveillance and research functions, which will be beneficial not only for the laboratory activities and treatment but also for policy making and deciding the direction of TB control in the near future.

4) Policy making: Policy making should be based on statistics obtained from appropriate monitoring and data collection. Completion of the Project will help to develop the system for compiling and analyzing statistics, and allow policy decisions to be made based on accurate and up-to-date information.

(2) Indirect Effect

It is expected that overall TB control in Cambodia will be improved, by strengthening of each function of CENAT through the Project. In other words, the functions of CENAT, such as policy making for NTP, training of personnel implementing NTP, epidemiological surveillance and analysis, research, and education will be strengthened through the Project.

In consequence, it will become possible to achieve their targets of 85% cure rate for diagnosed cases, and 75% detection rate for sputum smear positive TB cases. TB control, including detection at an early stage, prevention, and treatment in Cambodia will be improved. In addition, most TB patients are in the age range of 20 to 50, which is the most productive generation for economic activities. Consequently, the promotion of TB control by the Project is expected to lead to an improvement of the economic situation in Cambodia.

4.2 Recommendation

The smooth implementation and good outcome of the Project in cooperation with PTTC is highly expected by both the Government of Cambodia and the Government of Japan.. In order to succeed, however, the full commitment of the Government of Cambodia is imperative. It is anticipated that the implementation of the Project will have positive effects if the following issues are solved:

(1) Strengthening the Training System

Training for health personnels involved in TB control is one of the important functions of CENAT. Several kinds of training courses and seminars for the health personnel and Laboratory technicians in TB units, provincial supervisors, private clinic doctors and so on have been carried out, and will be carried out in the future in CENAT.

However, these training activities appear to depend heavily on donors' support with regard to budget and training program, most of which are supported by WHO, WB, MSF, etc. Training for smear examination has been done under the guidance of JICA experts. In addition, the PTTC Project which commenced in August 1999 and will continue until 2004 is expected to include the training of health staff as one of it's activities, and this PTTC Project will be supported by the completion of the Project. It is expected that a CENAT training system will be developed in the future by strengthening of the management system and improvement of the trainers skill.

(2) Establishment of Operation and Maintenance System of Facility and Equipment

The MOH has a division taking care of buildings, "Bureau of Material Management, Government Property, Construction". However, since it has only a few engineers for maintenance, maintenance has not been carried out adequately. In CENAT, only one electrician and one X-ray technician have been taking care of generators and other electrical equipment. Therefore, the strengthening of the maintenance capability in CENAT is highly needed for the new buildings after the completion of the Project.

MOH started to establish a system to strengthen the operation and maintenance of facilities and equipment in MOH supported by WB and ADB. As for CENAT, it has been planned to increase the number of electricians. However, engineers for plumbing and equipment are also required. It is planned that the engineers for maintenance will be trained through the installation work of utilities during the construction stage. In addition to increase the number of engineers, it is required to establish a daily maintenance system in CENAT and an operation and maintenance system for facilities and equipment in MOH.

(3) Establishment of a Self-funding System

Operating costs of CENAT are paid by the government budget and the support of donors. Therefore it is very important to secure adequate funding for the operation of the new facilities and equipment based on the appropriate estimation and request from CENAT to GOC or donors.

MOH has introduced the user fee system to the medical care services, and some facilities have started to get income through this system. However, the treatment of Tuberculosis should be free of charge in principle, therefore it is very difficult for CENAT to obtain

income this way. It is under discussion whether to start to collect service charges from patients who are sent from other private hospitals or clinics for X-rays and general laboratory services. It is expected that income will be obtained from these services and that a self-funding system is established for further development of CENAT in the future.

(4) Project Responsibilities of the Cambodian Side

For the smooth operation of the Project towards completion, the site preparation work to be dealt with by the GOC is should be completed on schedule with the adequate fund required.

In particular, site preparation works, including renovation of the patient ward, transfer of activities from the Project site to the renovated ward, demolition of the existing buildings in the Project site, clearance and grading of the land, and relocation of the electrical sub-station are required. As confirmed by the Cambodian side, these works would be completed prior to the commencement of the construction of the new buildings, with the adequate fund required for this preparation work. Equipment, furniture and other supplies to be provided by the GOC must be prepared before the completion of construction.

APPENDICES

カンボディア王国結核対策強化計画基本設計調査団　団員名簿

Member List of Basic Design Study
on the Project for Improvement of National Tuberculosis Center
in the Kingdom of Cambodia

1.	総括／須知　雅史 Team Leader, Dr. Masashi SUCHI	財団法人結核予防会結核研究所国際協力部企画調査科科長 Chief, Project Development and Management Division, Department of International Cooperation, The Research Institute of Tuberculosis, Japan Anti-Tuberculosis Association
2.	技術参与／皆川　達哉 Technical Advisor, Mr. Tatsuya MINAKAWA	厚生省保健医療局国立病院部経営指導課建築専門官 Advisor of Architecture, Managemental Guidance Division, Department of National Hospital, Health Service Bureau, Ministry of Health and Welfare
3.	計画管理／平井　利奈 Project Coordinator, Rina HIRAI	国際協力事業団無償資金協力調査部調査第一課 First Project Study Division, Grant Aid Project Study Department, Japan International Cooperation Agency (JICA)
4.	業務主任／波多野　哲次 Project Manager, Tetsuji HATANO	（株）パシフィックコンサルタンツインターナショナル PACIFIC CONSULTANTS INTERNATIONAL
5.	建築計画／中村　博明 Architectural Planner, Hiroaki NAKAMURA	（株）パシフィックコンサルタンツインターナショナル PACIFIC CONSULTANTS INTERNATIONAL
6.	設備計画／島田　隆次 Facility and Utility Planner, Takatsugu SHIMADA	（株）パシフィックコンサルタンツインターナショナル PACIFIC CONSULTANTS INTERNATIONAL
7.	機材計画／今里　悠一 Equipment Planner, Yuichi IMASATO	（株）パシフィックコンサルタンツインターナショナル PACIFIC CONSULTANTS INTERNATIONAL
8.	調達計画・積算／佐々　優子 Cost and Procurement Planner, Yuko SASA	（株）パシフィックコンサルタンツインターナショナル PACIFIC CONSULTANTS INTERNATIONAL

カンボディア王国結核対策強化計画基本設計概要説明調査団　団員名簿

Member List of Draft Report Explanation
On the Project for Improvement of the National Tuberculosis Center
In the Kingdom of Cambodia

1. 総括 / 須知　雅史 Team Leader, Dr. Masashi SUCHI	財団法人結核予防回結核研究所国際協力部 企画調査科科長 Chief, Project Development and Management Division, Department of International Cooperation, The Research Institute of Tuberculosis, Japan Anti-Tuberculosis Association
2. 計画管理 / 平井　利奈 Project Coordinator, Ms. Rina HIRAI	国際協力事業団無償資金協力調査部調査第一課 Second Project Management Division, Grant Aid Management Department, Japan International Cooperation Agency (JICA)
3. 業務主任 / 波多野　哲次 Project Manager, Mr. Tetsuji HATANO	(株)パシフィックコンサルタンツインターナショナル PACIFIC CONSULTANTS INTERNATIONAL
4. 建築計画 1 / 中村　博明 Architectural Planner -1, Mr. Hiroaki NAKAMURA	(株)パシフィックコンサルタンツインターナショナル PACIFIC CONSULTANTS INTERNATIONAL
5. 構造計画 1 / 後藤　俊三 Structural Planner, Mr. Shunzo GOTO	(株)パシフィックコンサルタンツインターナショナル PACIFIC CONSULTANTS INTERNATIONAL
6. 設備計画 1 / 島田　隆次 Facility and Utility Planner -1, Mr. Takatsugu SHIMADA	(株)パシフィックコンサルタンツインターナショナル PACIFIC CONSULTANTS INTERNATIONAL
7. 設備計画 2 / 井元　知明 Facility and Utility Planner -2, Mr. Chiaki IMOTO	(株)伊藤喜三郎建築研究所 K. ITO ARCHITECTS & ENGINEERS INC.

8.	機材計画 1 / 今里　悠一 Equipment Planner -1, Mr. Yuichi IMASATO	(株)パシフィックコンサルタンツインターナショナル PACIFIC CONSULTANTS INTERNATIONAL
9.	機材計画 2 / 中谷　浩明 Equipment Planner -2, Mr. Hiroaki NAKATANI	(株)パシフィックコンサルタンツインターナショナル PACIFIC CONSULTANTS INTERNATIONAL
10.	積算・調達計画/ 佐々 優子 Cost and Procurement Planner, Ms. Yuko SASA	(株)パシフィックコンサルタンツインターナショナル PACIFIC CONSULTANTS INTERNATIONAL

カンボディア王国結核対策強化計画基本設計調査成果概要説明調査　団員名簿

Member List of Draft Final Report Explanation Study
on the Project for Improvement of National Tuberculosis Center
in the Kingdom of Cambodia

1.	総括／須知　雅史 Team Leader, Dr. Masashi SUCHI	財団法人結核予防会結核研究所国際協力部企画調査科科長 Chief, Project Development and Management Division, Department of International Cooperation, The Research Institute of Tuberculosis, Japan Anti-Tuberculosis Association
2.	業務主任／波多野　哲次 Project Manager, Tetsuji HATANO	（株）パシフィックコンサルタンツインターナショナル PACIFIC CONSULTANTS INTERNATIONAL
3.	建築計画／中村　博明 Architectural Planner, Hiroaki NAKAMURA	（株）パシフィックコンサルタンツインターナショナル PACIFIC CONSULTANTS INTERNATIONAL
4.	構造計画／後藤　俊三 Structural Planner, Shunzo GOTO	（株）パシフィックコンサルタンツインターナショナル PACIFIC CONSULTANTS INTERNATIONAL
5.	設備計画／島田　隆次 Facility and Utility Planner, Takatsugu SHIMADA	（株）パシフィックコンサルタンツインターナショナル PACIFIC CONSULTANTS INTERNATIONAL
6.	調達計画・積算／佐々　優子 Cost and Procurement Planner, Yuko SASA	（株）パシフィックコンサルタンツインターナショナル PACIFIC CONSULTANTS INTERNATIONAL

(1) Survey Schedule of Basic Design Study (April 1～May 5, 1999)

No	Date	Member & Movement	Activity
1.	Apr. 1 (Thu)	NRT→BKK(NH915) (All consultant members)	- Member's Meeting
2.	Apr. 2 (Fri)	BKK→PNH(TG696) (All consultant members)	- Meeting with the officials from JICA Cambodia office - Meeting with CENAT - Meeting with EDC
3.	Apr. 3 (Sat)	NRT→BKK(JL707) Dr. Suchi/Mr. Minakawa/Ms. Hirai (All consultant members)	- Meeting with CENAT and site survey
4.	Apr. 4 (Sun)	BKK→PNH(TG696) Dr. Suchi/Mr. Minakawa/Ms. Hirai (All consultant members)	- All member's Meeting for analysis of collected data and information
5.	Apr. 5 (Mon)	(All members)	- Courtesy calls to and meeting with the officials from: • JICA office • CDC • Embassy of Japan • MOH - Meeting with WHO and MSF
6.	Apr. 6 (Tue)	(All members) NRT→BKK(NH915) Ms. Sasa	- Meeting with CENAT for explanation of Inception Report and detailed discussion on the Application. - Site survey of CENAT
7.	Apr. 7 (Wed)	BKK→PNH(TG696) Ms. Sasa	- Meeting with CENAT - Courtesy calls to Mother and Child Health Center
8.	Apr. 8 (Thu)	Dr. Suchi/Mr.Minakawa/Ms. Hirai/ Mr. Hatano/ Mr. Imasato Mr. Nakamura/ Mr. Shimada Ms. Sasa	- Meeting with CENAT for discussion and confirmation of each proposed building and equipment plans - Site survey and meeting with related organizations - Site survey and procurement survey
9.	Apr.9 (Fri)	Dr. Suchi/Mr.Minakawa/Ms. Hirai/ Mr. Hatano/ Mr. Imasato Mr. Nakamura/Mr. Shimada Ms. Sasa	- Meeting on Minutes of Discussion with MOH and CENAT (signing on the Minutes) - Meeting with CENAT - Site survey - Site survey
10.	Apr. 10 (Sat)	(All members)	- All member's meeting
11.	Apr. 11 (Sun)	(All members)	- Analysis of collected data and information
12.	Apr. 12 (Mon)	Dr. Suchi/Mr.Minakawa/Ms. Hirai/ Mr. Hatano/Mr. Imasato Mr. Nakamura/Mr. Shimada Ms. Sasa	- Meeting with CENAT - Courtesy calls and Survey to Hospital Calmette - Meeting with related organizations

13.	Apr. 13 (Tue)	Dr. Suchi/Mr.Minakawa/ Ms. Hirai/Mr. Hatano Mr. Imasato Mr. Nakamura/Mr. Shimada Ms. Sasa PNH→BKK(TG699) Dr. Suchi/Mr.Minakawa/Ms. Hirai	- Report to Embassy of Japan and JICA - Meeting with CENAT - Site survey - Site survey and procurement survey
14.	Apr. 14 (Wed)	→NRT (All consultant members)	- All Member's Meeting
15.	Apr. 15 (Thu)	(All consultant members)	- All Member's Meeting
16.	Apr. 16 (Fri)	(All consultant members)	- All Member's Meeting
17.	Apr. 17 (Sat)	(All consultant members)	- All Member's Meeting
18.	Apr. 18 (Sun)	(All consultant members)	- All Member's Meeting - Meeting with Ms. Yamakami
19.	Apr. 19 (Mon)	(All consultant members) Mr. Shimada	- Interim meeting with CENAT (Detailed confirmation meeting on requirement) - Meeting with PISNOKA
20.	Apr. 20 (Tue)	(All consultant members)	- Site survey - Courtesy calls and Survey to Hospital Calmette and Instisut Pasteur
21.	Apr. 21 (Wed)	(All consultant members)	- Visit and Survey to Pochentong Health Center - Meeting with CENAT
22.	Apr. 22 (Thu)	(all consultant members)	- Meeting with CENAT - Meeting with related organizations
23.	Apr. 23 (Fri)	PNH→BKK(TG699)→ Mr. Hatano Mr. Nakamura/Mr. Shimada Mr. Imasato Ms. Sasa	 - Refer to JICA - Meeting with CENAT and Site survey - Survey for equipment procurement - Procurement survey
24.	Apr. 24 (Sat)	→NRT(NH916) (Mr. Hatano) Mr. Nakamura/Mr. Shimada/Mr. Imasato Ms. Sasa	 - Meeting with CENAT and Site survey - Survey for equipment procurement - Procurement survey
25.	Apr. 25 (Sun)	(All consultant members)	Analysis of collected data and information
26.	Apr. 26 (Mon)	Mr. Nakamura Mr. Shimada Mr. Imasato Ms. Sasa PNH→BKK(TG697) (Mr. Imasato)	- Site survey - Site survey and Meeting with related organizations - Survey for equipment procurement - Procurement survey
27.	Apr. 27 (Tue)	Mr. Nakamura Mr. Shimada Mr. Imasato Ms. Sasa	- Site survey - Site survey and Meeting with related organizations - Survey for equipment procurement - Procurement survey

28.	Apr. 28 (Wed)	Mr. Nakamura Mr. Shimada Ms. Sasa (All consultant members) Mr. Imasato	- Site survey - Site survey and Meeting with related organizations - Procurement survey - Report to JICA - Survey for equipment procurement
29.	Apr. 29 (Thu)	Mr. Nakamura/Mr. Shimada Mr. Imasato Ms. Sasa PNH→BKK(TG699)→ BKK→ (All consultant members)	- Site survey - Survey for equipment procurement - Procurement survey
30.	Apr. 30 (Fri)	→NRT(NH916) (All consultant members) Ms. Sasa	- Procurement survey
31	May 1 (Sat)	Ms. Sasa	- Procurement survey
32	May 2 (Sun)	Ms. Sasa	- Procurement survey
33	May 3 (Mon)	Ms. Sasa	- Procurement survey
34	May 4 (Tue)	Ms. Sasa BKK→ Ms Sasa	- Procurement survey
35	May 5 (Wed)	→NRT(NH916) Ms. Sasa	

The Basic Design Study on the Project for Improvement of National Tuberculosis Center in the Kingdom of Cambodia

(2) Schedule on the Draft Report Explanation Study (July 13 – August 5, 1999)

	Date	Member & Movement	Activity
1	July 13 (Tue)	NRT (10:00) -> BKK (14:25) [NH915] 17:00 Delta Grand Hotel	 - Meeting with Topographic Surveyor.
2	July 14 (Wed)	<All members> BKK (8:35) -> PHN (9:50) [TG696] 15:00 JICA Office 16:00 MOH & CENAT at MOH <Mr. Goto & Ms. Sasa> All Day	 - Courtesy calls to and meeting with the official of JICA. - Courtesy calls to and meeting with the Dr. Eng Huot, Director General for Health. - Survey of procurement of construction materials
3	July 15 (Thu)	<Mr. Goto & Ms. Sasa> BKK (8:50) -> PHN (9:50) [TG696] <Other members> 8:30 CENAT 14:30 CENAT	 - Meeting with CENAT for explanation of Draft Report, and discussion on the Architectural matters. - Survey of existing buildings and measurement of noise in the site.
4	July 16 (Fri)	<Mr. Shimada, Mr. Nakamura, Mr. Imasato, and Ms. Sasa > 8:30 CENAT 15:00 CENAT <Mr. Goto, Mr. Imoto, and Mr. Nakatani> 10:00 Pasteur du Cambodge 15:00 CENAT <Mr. Shimada & Mr. Imoto> 14:30 Police Fire Service	 - Discussion on the Mechanical and Electrical matters with staff of CENAT. - Discussion on the Equipment plan and the Operation and Management plan of CENAT. - Investigation of Relevant Facility. - Survey of Existing Building and Transformer Building. - Meeting with the director of Police Fire Service.
5	July 17 (Sat)	10:00 Hotel Sofitel Cambodiana 11:30 Phnom Penh City	- Investigation of Mechanical and Electrical system of the Hotel. - Market survey of construction materials in Phnom Penh City. - Analysis of data and information collected. - Team Meeting.
6	July 18 (Sun)		- Analysis of data and information collected
7	July 19 (Mon)	<Mr. Shimada, Mr. Nakamura, Mr. Imasato, and Ms. Sasa> 8:30 CENAT 9:00 MOH 10:00 WB project office in MOH 14:30 CENAT 15:00 MOH 16:30 JICA	 - Discussion on the project budget with Mr. Chea Kim Long, Director of Budget and Finance. - Courtesy call to and meeting with Dr. Vandine, WB. Meeting with staff of CENAT. Discussion on the budget for CENAT. - Interim Report on the survey progress to Mr. Saito, JICA

	Date	Member & Movement	Activity
		<Mr. Goto, Mr. Imoto, Mr. Nakatani> 8:30 CENAT 15:00 MCH	- Sectional Meeting with CENAT and relevant organizations. - Investigation of relevant facilities.
8	July 20 (Tue)	<Mr. Hatano> NRT (11:00) -> BKK (15:15) [JL717] <Other Members> 8:30 CENAT / PPWSA/ others	- Meeting with staff of CENAT and relevant organizations. - Discussion about brief specs of equipment. - Survey of relevant facilities
9	July 21 (Wed)	<Mr. Hatano> BKK (8:35) -> PHN (9:50) [TG696] <Dr. Suchi and Ms. Hirai> NRT (11:00) -> BKK (15:15) [JL717] <Other Members> 8:30 CENAT	- Sectional Meeting with CENAT and relevant organization. - Survey of relevant facilities
10	July 22 (Thu)	<Dr. Suchi and Ms. Hirai> BKK (8:35) -> PHN (9:50) [TG696] <Consultant Members> 9:00 CENAT <Dr. Suchi, Ms. Hirai, Mr. Hatano and Mr. Imasato> 14:00 JICA Office 15:00 Embassy of Japan <All members> 16:00 MOH	- Courtesy calls to and meeting with the officials from EOJ, JICA and MOH - Meeting with staff of CENAT. - Courtesy calls to and meeting with the Dr. Eng Huot, Director General for Health.
11	July 23 (Fri)	<Dr. Suchi, Ms. Hirai, Mr. Hatano and Mr. Imasato> 8:00 CDC (Council for Development of Cambodia) <All members> 9:00 MOH(Dr. Mam Bunheng) 10:45 CENAT <Mr. Goto and Ms. Sasa> 14:30 Municipality of Phnom Penh	- Courtesy calls to and meeting with the officials from CDC - Courtesy calls to and meeting with Dr. Mam Bunheng, Secretary of State for Health. - Discussion on the schedule of Cambodian side work. - Meeting with the officials from Department of Urbanization and Construction, Municipality of Phnom Penh.
12	July 24 (Sat)	<Dr. Suchi, Ms. Hirai, Mr. Hatano, Mr. Shimada, Mr. Imoto, Mr.Imasato, Mr. Nakatani> 11:00 Royal Phnom Penh Hotel	- Sectional Meeting with Ms. Yamagami. - Team Meeting.
13	July 25 (Sun)		- Analysis of data and information collected - Team Meeting
14	July 26 (Mon)	<Other members> 8:50 CENAT	- Meeting with CENAT for discussion and confirmation of the Basic Design and Cambodian Side Work.

	Date	Member & Movement	Activity
		14:30 MOH 16:30 <Mr. Goto, Imoto & Nakatani> PHN (16:45) -> BKK (17:50) [TG699] <Mr. Matsuda> NRT (10:00)-> BKK (14:25)[NH925]	- Meeting with Dr. Kuyseang, Director General of Administration and Finance - Team Meeting
15	July 27 (Tue)	<Mr. Goto, Imoto & Nakatani> BKK (1:55) -> NRT (9:55)[NH926] <Mr. Matsuda> BKK (8:35)-> PHN (9:50)[TG696] <Other members> 8:45 CENAT 9:45 CMS	- Meeting on Minutes of Discussion with MOH, CENAT and relevant organization. - Investigation of Central Medical Store(CMS).
17	July 28 (Wed)	<All Members> 9:00 MOH 15:00 MOH	- Meeting and Discussion on Minutes of Discussions with MOH, CENAT and relevant organization - Signing on the Minutes of Discussions by Dr. Mam Bunheng and Dr. Suchi.
18	July 29 (Thu)	<Dr. Suchi , Ms. Hirai, Mr. Hatano and Mr. Imasato> 9:00 JICA 10:00 Embassy of Japan <Dr. Suchi & Ms. Hirai> PHN (16:45) -> BKK (17:50) [TG699] BKK (22:30) -> [JL718] <Mr. Shimada & Mr. Imasato> 10:00 EDC <Mr. Nakamura & Ms. Sasa> 10:00 CENAT 15:00 Phnom Penh City	- Report on the survey result to JICA. - Report on the survey result to EOJ. - Meeting and Discussion with the officials from EDC. - Meeting and Discussion with the staff of CENAT. - Investigation of purchase of the equipment and construction materials.
19	July 30 (Fri)	<Dr. Suchi & Ms. Hirai> -> NRT (6:20) <Consultant members> 8:30 CENAT <Mr. Hatano> PHN (16:45) -> BKK (17:50) [TG699] BKK (22:30) -> [JL718] <Other Consultant Members> 14:30 MEC	- Meeting with CENAT. - Investigation of maintenance system by Medical Engineering Center in Cambodian Red Cross.
20	July 31 (Sat)	<Mr. Hatano> -> NRT (6:20)	- Team Meeting - Sectional Meeting with CENAT
21	Aug. 1 (Sun)	<Mr. Imasato & Ms. Sasa> PHN (16:45) -> BKK (17:50)[TG699]	- Analysis of data and information collected - Team Meeting

	Date	Member & Movement	Activity
22	Aug. 2 (Mon)	<Mr.Shimada, Mr.Nakamura and Mr. Matsuda> 8:30 CENAT 16:30 MOH <Mr. Imasato & Ms. Sasa> All day	- Meeting with staff of CENAT. - Meeting with Mr. Chea Kim Long, Director of Budget & Finance Department. - Survey of procurement condition of Equipment and Construction materials.
23	Aug. 3 (Tue)	<Mr.Shimada, Mr.Nakamura and Mr. Matsuda> 8:30 CENAT <Mr. Nakamura> 9:00 ADB <Mr. Imasato & Ms. Sasa> All day	- Meeting with staff of CENAT and confirmation of the boundary line of the site. - Meeting with the staff of ADB. - Survey of procurement condition of Equipment and Construction materials. -
24	Aug. 4 (Wed)	<Mr. Shimada, Nakamura, Matsuda> 8:30 CENAT 9:30 JICA PHN (16:45) -> BKK (17:50)[TG699] <Mr. Imasato & Ms. Sasa> <All members> BKK (22:15) -> [NH916]	- Meeting for confirmation of the result of survey with staff of CENAT. - Report on the result of survey to Mr. Saito, JICA. - Survey of procurement condition of Equipment and Construction materials.
25	Aug. 5 (Thu)	-> NRT (6:15)	

The Basic Design Study on the Project for Improvement of National Tuberculosis Center in the Kingdom of Cambodia

(3) Schedule on the Draft Final Report Explanation Study (October 24 – November 12, 1999)

	Date	Member & Movement	Activity
1	Oct. 24 (Sun)	<Mr. Shimada, Nakamura, and Ms. Sasa> NRT (16:25) -> BKK (20:40) [NH915]	
2	Oct. 25 (Mon)	BKK (8:35) -> PHN (9:50) [TG696] JICA Office	- Courtesy calls to and meeting with the officials of JICA
3	Oct. 26 (Tue)	CENAT	- Meeting with CENAT for explanation of Draft Final Report
4	Oct. 27 (Wed)	<Mr. Matsuda> NRT (10:00) -> BKK (14:25) [NH915]	- Sectional Meeting with staff in CENAT & Site Survey
5	Oct. 28 (Thu)	CENAT <Mr. Matsuda> BKK (8:35)->PHN (9:50) [TG696]	- Sectional Meeting with CENAT and relevant organizations
6	Oct. 29 (Fri)	CENAT	- Sectional Meeting with CENAT and relevant organizations
7	Oct. 30 (Sat)		- Survey of procurement of construction materials
8	Oct. 31 (Sun)	<Mr. Hatano & Mr. Goto> NRT (19:00) -> BKK (23:59) [TG773]	- Analysis of data and information collected - Team Meeting
9	Nov. 1 (Mon)	<Mr. Hatano & Mr. Goto> BKK (8:20) -> PHN (9:35) [TG696] <Dr. Suchi> NRT (11:00) -> BKK (15:15) [JL717]	- Analysis of data and information collected - Team Meeting - Survey of relevant facilities
10	Nov. 2 (Tue)	CENAT (8:30) <Dr. Suchi> BKK (8:35) -> PHN (9:50) [TG696] JICA Office(14:00) CENAT(15:00)	- Courtesy calls to and meeting with CENAT - Courtesy calls to and meeting with the officials of JICA - Courtesy calls to and Discussion on the Draft Final Report with CENAT
11	Nov. 3 (Wed)	CENAT(8:30) Embassy of Japan(15:00) MOH(16:00)	- Discussion on the Draft Final Report with CENAT - Courtesy calls to the officials of Embassy of Japan - Courtesy calls to and Discussion on the Minutes of Discussions
12	Nov. 4 (Thu)	CENAT(9:00) MOH(15:00) MOH (19:00)	- Meeting with CENAT - Signing on the Minutes of Discussions with Dr. Mam Bunheng - Reception Party
13	Nov. 5 (Fri)	JICA(8:30) CENAT (10:00) <Dr. Suchi> PHN (17:10) -> BKK (18:15)	- Report to JICA - Meeting with CENAT

	Date	Member & Movement	Activity
14	Nov. 6 (Sat)	<Dr. Suchi> BKK (11:10)-> MNL(15:20)[TG620] <Mr. Matsuda> PHN (17:10) -> BKK (18:15) [TG699] BKK(23:05) ->	- Survey of procurement of construction materials
15	Nov. 7 (Sun)	<Mr. Matsuda> -> NRT (6:35) [NH916] <Mr. Hatano> PHN (17:10) -> BKK (18:15) [TG699]	- Team Meeting
16	Nov. 8 (Mon)	<Mr. Goto> PHN (17:10) -> BKK (18:15) [TG699] <Mr. Hatano & Mr. Goto> BKK (22:50) -> [JL718]	- Sectional Meeting with CENAT and relevant organizations <Mr. Hatano> - Survey of procurement of construction materials
17	Nov. 9 (Tue)	<Mr. Hatano & Mr. Goto> -> NRT (6:20) <Mr. Shimada, Mr. Nakamura and Ms. Sasa > PHN (17:10) -> BKK (18:15) [TG699]	- Sectional Meeting with CENAT and relevant organizations - Survey of procurement of construction materials
18	Nov.10 (Wed)		- Survey of procurement of construction materials
19	Nov.11 (Thu)	<Mr. Shimada, Mr. Nakamura and Ms. Sasa> BKK (23:05) -> [NH916]	- Survey of procurement of construction materials
20	Nov.12 (Fri)	<Mr. Shimada, Mr. Nakamura and Ms. Sasa> -> NRT (6:35)	

(1) Basic Design Study (April 1 ~ May 5, 1999)

1. Embassy of Japan

Mr. Tsuyoshi Ishimoto	:	Second Secretary, Embassy of Japan

2. JICA Cambodia Office

Mr. Norio Matsuda	:	Resident Representative
Mr. Masatoshi Teramoto	:	Assistant Resident Representative

3. JICA's Expert

Ms. Kiyoko Yamakami	:	Medical Technologist

4. CENAT (The National Tuberculosis Center)

Dr. Kong Kim San	:	Director
Dr. Touch Sareth	:	Vice Director
Dr. Team Bak Khim	:	Chief of Technical Bureau
Dr. Keo Sokonth	:	Deputy Chief of Technical Bureau, Chief of Hospital Department
Dr. Peou Satha	:	Chief of Radiography Department
Dr. Sun Nasy	:	Chief of Laboratory
Dr. Phung Bunvar	:	Chief of Pharmacy
Dr. Yous Bun Heng	:	Chief of Dispensary
Dr. Teng Kunthy	:	Chief of Ambulatory DOTS
Dr. Nep Sok	:	Chief of Administration Bureau
Ms. Tan Chhavivan	:	Chief of Laboratory
Dr. Iv Chhun Ros	:	Vice Chief of Administration
Dr. Kruy Chheang Tay	:	Vice Chief of Laboratory
Dr. Mau Nisy	:	Vice Chief of Dispensary
Dr. Tan Kundara	:	Technical Office
Dr. Hout Chan Yuda	:	Technical Office
Dr. Tieng Sivanna	:	Technical Office
Dr. Khum Kim Eam	:	Medical Officer of Technical Bureau
Dr. Uon Narom	:	Pharmacist

5. EDC (Electricitè du Cambodge)

Mr. Iv Visal	:	Deputy Head of Network Office
Mr. Khy Sokhan	:	Electronic Engineer

6. CDC (Council for Development of Cambodia)

H.E. Mr. Chhieng Yanara	:	Deputy Secretary General of the Council

	Ms. Michiko Umezaki	:	JICA Expert on Aid Coordination & Management
7.	MOH (Ministry of Health)		
	Dr. Mam Bunheng	:	Secretary of State for Health
	Dr. Eng Hout	:	Director General for Health
	Ms. Khout Thavary	:	Deputy Chief of Finance & Accounting Department
	Mr. Huy Seth	:	Director of Administration Department
	Ms. Khan Kunthea Kalyan	:	Staff, Accounting – Finance Office
8.	Cambodian Medical Association		
	Prof. Sau Sok Khonn MD	:	President
	Dr. Touch Sareth MD	:	Secretary General
9.	MSF (Medecins Sans Frontieres Section France)		
	Dr. Maria Mar Pujades		Project TB
10.	World Health Oganizaiton (WHO)		
	Mr. David Awcock	:	VSO Administration Advisor
	Mr. Sebert Jacques	:	Technical Advisor
11.	National Mother and Child Health Center (NMCHC)		
	Mr. Hidechika Akashi	:	MCH Project Team Leader
12.	Pochentong Health Center		
	Dr. Ouk Narith	:	Vice Director
	Dr. Som Bunna	:	Supervisor
13.	Instisut Pasteur du Cambodge		
	Ms. Kruy Sun Lay	:	Directeur Adjoint
14.	Municipality of Phnom Penh		
	Mr. Moeung Sophan	:	Deputy Director of Drainage & Sewerage Division
	Mr. Sin Sok	:	Director, Department of Urbanization and Construction
	Mr. Yos Chhom Narady	:	Directeur Adjoint, Department of Urbanization and Construction
	Mr. Penh Sakhoeun	:	Chief of Construction
15.	Phnom Penh Municipal Police Fire Service		
	Mr. Soun Sopheak	:	Director
	Mr. Dy Eav	:	Deputy Director

	Mr. Dong Sokhom	:	Deputy Director

16. Ministry of Water Resource and Meteorology

Ms. Seth Vannareth	:	Deputy Director, Department of Meteorology
Ms. Peou Vanna	:	Chief of Climatology Office, Department of Meteorology

17. Cambodian Red Cross

Mr. Keo Vibol	:	Chief Engineer
Mr. Paul Steer	:	Electrical Advisor, Medical Engineering Team

18. Ministry of Land Management, Urban Planning and Construction

Mr. Long Narith	:	Representative of MLUC to MOH
Mr. Chin Deap	:	Engineer
Mr. Nou Arlin	:	Architect

19. Department of Pollution Control Division, Ministry of Environment

Mr. Thoek Kroeunvutha	:	Urban Secretary of State
Mr. Heng Nareth	:	Director

20. Garbage Collecting Private Company "PSBK" Office

Mr. Ros Sokkin	:	Collecting Fee Section

21. Ministry of Posts and Telecommunications

Mr. Motonori Ando	:	Expert of Telecommunications

22. Incharge Angkor and Bantey Srey telecom Center

Mr. Lors Borath	:	Deputy Director

23. Local Contractor and M/E Engineering Company "PISNOKA International CORP."

Mr. Sok Sothyra	:	Director
Mr. Ay Chuminith	:	Staff
Mr. Pich Thavy	:	Staff

24. Local Contractor and M/E Engineering Company "Kien Huot Enterprize CO., LTD."

Mr. Chang Jin Ping	:	Chairman
Mr. Teng Leang	:	Civil Engineer

25. Local Contractor and M/E Engineering Company "P.P.C. Company"

Mr. Thang Tuy	:	Director

26. Local Contractor and M/E Engineering Company "Comin Khmere CO., LTD."

Mr. Por Nimol	:	Senior Sales Exective
Mr. Frantz Uaganay	:	Sales Manager

27. Siam Tone CO., LTD.

Mr. Mitsuo Yamada	:	President
Mr. Supoj Mangmesap	:	Senior Engineer

(2) Draft Report Explanation Study (July 13 ~ August 5, 1999)

1. Embassy of Japan

Mr. Tsuyoshi Ishimoto	:	Second Secretary, Embassy of Japan

2. JICA Cambodia Office

Mr. Norio Matsuda	:	Resident Representative
Mr. Masatoshi Teramoto	:	
Mr. Katsuyoshi Saito	:	Assistant Resident Representative

3. JICA's Expert

Mr. Kiyoko Yamakami	:	Medical Technologist

4. CENAT (the National Tuberculosis Center)

Dr. Kong Kim San	:	Director
Dr. Touch Sareth	:	Vice Director
Dr. Team Bak Khim	:	Chief of Technical Bureau
Dr. Keo Sokonth	:	Deputy Chief of Technical Bureau, Chief of Hospital Department
Dr. Khum Kim Eam	:	Medical Officer of Technical Bureau
Dr. Peou Satha	:	Chief of Radiography Department
Dr. Yous Bun Heng	:	Chief of Dispensary
Dr. Phung Bunvar	:	Chief of Pharmacy
Ms. Tan Chhavivan	:	Chief of Laboratory
Dr. Nep Sok	:	Chief of Administration Bureau
Ms. Iv Chhun Ros	:	Vice Chief of Administration, Chief of Secretariat
Dr. Uon Narom	:	Pharmacist
Mr. Chou Kim Sreng	:	Radiotechnologist

5. EDC (Electricitè du Cambodge)

Mr. Iv Visal	:	Deputy Head of Network Office

6. CDC (Council for Development of Cambodia)

Mr. Leaph Vannden	:	Deputy Secretary General
Ms. Heng Sokun	:	Deputy Director, Bilateral Aid Coordination Department
Ms. Michiko Umezaki	:	JICA Expert on Aid Coordination & Management

7. MOH (Ministry of Health)

Dr. Mam Bunheng	:	Secretary of State for Health

Dr. Eng Hout	:	Director General for Health
Dr. Sok Touch	:	Acting Director of Communicable Disease Control Department
Mr. Huy Seth	:	Director of Administration Department
Dr. Kuyseang TE	:	Director General of Administration and Finance
Mr. Chea Kim Long	:	Director of Budget and Finance
Ms. Youk Sambath	:	Deputy Director for Finance & Budget
Ms. Khout Thavary	:	Deputy Chief of Finance & Accounting Department
Ms. Khan Kunthea Kalyan	:	Staff, Accounting – Finance Office
Mr. Uy Sophal	:	Liquidation Office

9. MSF (Medecins Sans Frontieres Section France)

Dr. Maria Mar Pujades		Project TB

10. WHO

Mr. David Awcock	:	VSO Administration Advisor
Mr. Sebert Jacques	:	Technical Advisor

11. World Bank

Dr. Or Vandine	:	Deputy-Project Director and PCU Manager

12. NMCHC (National Mother and Child Health Center)

Mr. Hidechika Akashi	:	JICA Expert, MCH Project Team Leader
Mr. Shoichi Shimizu	:	JICA Expert
Ms. Kei Suzuki	:	JICA Expert

13. Municipality of Phnom Penh

Mr. Sin Sok	:	Director, Department of Urbanization and Construction
Mr. Penh Sakhoeun	:	Chief of Construction, Department of Urbanization and Construction

14. Instisut Pasteur du Cambodge

Mr. Philippe Glaziou	:	Medecin Epidemiologiste

15. Ministry of Public Works and Transport

Mr. Murakami	:	JICA Expert
Mr. Tetsuo Hagiwara	:	JICA Expert

16. Phnom Penh Municipal Police Fire Service

Mr. Soun Sopheak	:	Director

17. PPWSA

Ms. Atsuko Kobashikawa	:	JICA Expert, Laboratory Technician

18. Medical Engineering Center, Cambodian Red Cross

Mr. Keo Vibol	:	Chief Engineer
Mr. Kong Phalla	:	Senior Engineer
Mr. Paul Steer	:	Electrical Advisor, Medical Engineering Team

19. Siam Tone CO., LTD.

Mr. Mitsuo Yamada	:	President
Mr. Supoj Mangmesap	:	Senior Engineer

(3) Draft Final Report Explanation Study (October 14～November 12, 1999)

1. Embassy of Japan

Mr. Tsuyoshi Ishimoto	:	Second Secretary, Embassy of Japan

2. JICA Cambodia Office

Mr. Norio Matsuda	:	Resident Representative
Mr. Katsuyoshi Saito	:	Assistant Resident Representative

3. JICA's Expert

Dr. Ikushi Onozaki	:	Team Leader
Mr. Masashi Iizuka	:	Coordinator

4. MOH (Ministry of Health)

Dr. Mam Bunheng	:	Secretary of State for Health
Dr. Eng Hout	:	Director General for Health
Dr. Kuyseang TE	:	Director General of Administration and Finance
Mr. Huy Seth	:	Director of Administration Department
Mr. Chea Kim Long	:	Director of Budget and Finance
Ms. Khan Kunthea Kalyan	:	Staff, Accounting – Finance Office
Mr. Uy Sophal	:	Liquidation Office

5. CENAT (the National Tuberculosis Center)

Dr. Kong Kim San	:	Director
Dr. Touch Sareth	:	Vice Director
Dr. Peou Satha	:	Chief of Radiography Department
Dr. Team Bak Khim	:	Chief of Technical Bureau
Dr. Keo Sokonth	:	Deputy Chief of Technical Bureau, Chief of Hospital Department
Dr. Khum Kim Eam	:	Medical Officer of Technical Bureau
Dr. Yous Bun Heng	:	Chief of Dispensary
Dr. Phung Bunvar	:	Chief of Pharmacy
Ms. Tan Chhavivan	:	Chief of Laboratory
Dr. Nep Sok	:	Chief of Administration Bureau
Ms. Iv Chhun Ros	:	Vice Chief of Administration, Chief of Secretariat
Dr. Uon Narom	:	Pharmacist
Mr. Chou Kim Sreng	:	Radiotechnologist

6. WHO

Mr. David Awcock	:	VSO Administration Advisor

7. World Bank

Dr. Or Vandine	:	Deputy-Project Director and PCU Manager
Mr. Hans Zomer	:	Hospital Maintenance Engineer

8. NMCHC (National Mother and Child Health Center)

Mr. Hidechika Akashi	:	JICA Expert, MCH Project Team Leader
Mr. Shoichi Shimizu	:	JICA Expert
Ms. Kei Suzuki	:	JICA Expert
Ms. Yoshiko Kudo	:	JICA Expert

9. Municipality of Phnom Penh

Mr. Penh Sakhoeun	:	Chief of Construction, Department of Urbanization and Construction
Mr. Chhnon Seang Lan	:	Construction Engineer, Deputy Manager of Constructor and Study Project Plans, Department of Urbanization and Construction

10. EDC (Electricitè du Cambodge)

Mr. Iv Visal	:	Deputy Head of Network Office

MINUTES OF DISCUSSIONS ON THE BASIC DESIGN STUDY ON THE PROJECT FOR IMPROVEMENT OF THE NATIONAL TUBERCULOSIS CENTER IN THE KINGDOM OF CAMBODIA

In response to a request from the Government of the Kingdom of Cambodia (hereinafter referred to as "Cambodia"), the Government of Japan decided to conduct a Basic Design Study on the Project for Improvement of the National Tuberculosis Center (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Cambodia the Basic Design Study Team (hereinafter referred to as "the Team") which is headed by Dr. Masashi Suchi, Chief, Project Development and Management Division, Department of International Cooperation, The Research Institute of Tuberculosis, Japan Anti-Tuberculosis Association, and is scheduled to stay in the country from April 2 to May 2, 1999.

The Team held discussions with the officials concerned of the Government of Cambodia and conducted a field survey at the study area.

In the course of discussions and field survey, both parties confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare the Basic Design Study report.

Phnom Penh, April 9, 1999

Dr. Masashi Suchi
Leader
Basic Design Study Team
Japan International Cooperation Agency

Dr. Mam Bunheng
Secretary of State for Health
Ministry of Health

Dr. Kong Kim San
Director
National Tuberculosis Center
Ministry of Health

ATTACHMENT

1. Objective of the Project

The objective of the Project is to strengthen the function of the National Tuberculosis Center as a center for the management and implementation of the National Tuberculosis Control Program (NTP) of Cambodia through construction of its facilities and procurement of medical equipment.

2. Project Site

The site of the Project is the National Tuberculosis Center, which is located in Boeng Keng Kang II Chamcamon, Phnom Penh, Cambodia.

3. Responsible and Implementing Agency

3-1 The Responsible Agency is Ministry of Health.
3-2 The Implementing Agency is the National Tuberculosis Center.

4. Items requested by the Government of Cambodia

After discussions with the Team, the following items were finally requested by the Cambodian side. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

4-1 Construction of the buildings and facilities
Details of items are listed in ANNEX-1.
4-2 Procurement of the equipment
Details of items are listed in ANNEX-2.
(Note: A = High Priority, B = Medium Priority, C = Low Priority)

5. Japan's Grant Aid Scheme

5-1 The Cambodian side understood the Japan's Grant Aid Scheme explained by the Team, as described in ANNEX-3.
5-2 The Cambodian side will take the necessary measures, as described in ANNEX-4, for smooth implementation of the Project, as a condition for the Japanese Grant Aid to be implemented.

6. Schedule of the Study

6-1 The consultants will proceed to further studies in Cambodia until May 2, 1999.
6-2 JICA will prepare the draft report in English and dispatch a mission in order to explain its contents in July, 1999.
6-3 Based on the results of discussions of the draft report, JICA will proceed to further examination of the study results in Japan until October, 1999.
6-4 JICA will prepare the draft final report in English and dispatch a mission in order to explain its contents in October, 1999.

M. S.

7. Other relevant issues

7-1 The Team explained that the Study was consisted of two phases; Phase I and II . In Phase I, JICA will prepare the draft report which includes a basic concept of the Project and its basic design. In Phase II , JICA will prepare the draft final report which includes the engineering design on the basis of the study results of Phase I. The final report will be completed by JICA through integration of the study results of both Phase I and II.

7-2 The National Tuberculosis Center shall be responsible for the results of the execution of the Project on the basis of all documents and drawings prepared as a result of the study.

7-3 The Cambodian side shall allocate the budget and assign personnel necessary for operation and maintenance of facilities and equipment.

7-4 The Cambodian side shall complete the implementation of the following undertakings by the commencement of the construction : (a) demolishing and clearance of the the existing facilities and utilities within the proposed site for construction shown in ANNEX-5, (b) leveling of ground in the site for construction.

7-5 Both sides agreed that the Cambodian side shall move the city transformer building from the existing place to the suitable place.

7-6 The Cambodian side will submit answers to the questionnaire which the Team handed to the Cambodian side by April 29, 1999.

ANNEX-1

Requested Items for Facility

The contents of the request finally submitted by Cambodian side regarding the facilities at the National Tuberculosis Center.

Division	Facilities
1. Program Management Office	1-1 Director room 1-2 Vice director room 1-3 Secretary 1-4 Advisors office
2. Administration Office	2-1 Chief office 2-2 Secretary office
3. Accounting Office	3-1 Chief office 3-2 Staff rooms 3-3 Storage -1 3-4 Storage -2
4. Technical Office	4-1 Chief office 4-2 Under chief, Secretary & Staff room 4-3 Storage 4-4 Statistics and Planning room 4-5 Meeting room -1 4-6 Meeting room -2 4-7 Library
5. Laboratory Unit	5-1 Chief and Vice chief room 5-2 Routine laboratory -1(General) 5-3 Routine laboratory -2(Sputum) 5-4 Research and Culture laboratory 5-5 Preparation room -1 5-6 Preparation room -2 5-7 Microscopy training room 5-8 Storage
6. X-ray Unit	6-1 Chief and Vice chief room 6-2 Staff & Registration room 6-3 Film storage room 6-4 X-ray reading room 6-5 Meeting room (Multi-purpose) 6-6 Dark room & Film drying room 6-7 Waiting space 6-8 X-ray room (for 2 machines) 6-9 Examination room

Division	Facilities
7. Pharmacy Unit	7-1 Chief room 7-2 Staff room 7-3 TB drug store 7-4 Reagent store 7-5 Distribution drug store 7-6 Medical material store 7-7 Document room
8. Dispensary	8-1 Staff room 8-2 Health education room 8-3 Consultation rooms (& Registration) 8-4 Storage 8-5 Drug distribute room 8-6 Serious care room (& TB Registration) 8-7 Waiting lobby 8-8 Document room 8-9 Carte storage 8-10 Acupuncture room 8-11 DOTS home office 8-12 Toilet for outpatients
9. Garage and Driver Unit	9-1 Garage (including Repairing room) 9-2 Drivers room 9-3 Laundry 9-4 Pump & Generation room 9-5 Staff room on guard 9-6 Security room 9-7 Sputum collection space 9-8 Mechanical & Electrical room
10. Others	10-1 Conference room 10-2 Dormitory 10-3 Parking: Cars 10-4 Parking: Motorcycle

Note 1. Both sides confirm that the facility mentioned above includes the related common spaces such as corridors, storage and machine room and the necessary utilities such as electricity, water supply, sewage and telecommunication etc. The details of such common spaces and utilities will be discussed further between the Japanese and Cambodian side.

2. The size and capacity of the facility will be determined after further studies.

M. S.

ANNEX-2

Requested Equipment List

Department	Rm No.	Items	Requested Q'ty	Priority
X-ray Unit	6-6	Drying & Developing Machine	1	A
X-ray Unit	6-4	Negatoscope	2	A
X-ray Unit	6-9	Echography Complete Set	1	B
X-ray Unit	6-9	Examination Bed	1	B
X-ray Unit	6-9	Bronchofiberscope	1	B
X-ray Unit	6-9	Medical TV System	1	B
X-ray Unit	6-9	Negatoscope	1	A
X-ray Unit	6-9	Lecturescope	1	B
X-ray Unit	6-9	Endoscope Cabinet w/sterilization	1	B
X-ray Unit	6-9	Disinfection Trolley for Endoscope	1	B
X-ray Unit	6-9	Tracking photograph camera	1	B
X-ray Unit	6-9	Examination Bed	1	B
X-ray Unit	6-8	X-ray Unit w/Bucky Table	1	A
X-ray Unit	6-8	Portable X-ray Unit	1	B
Dispensary	8-2	TV Complete Set	1	A
Dispensary	8-2	Radio Cassette Recorder	1	C
Dispensary	8-3	Negatoscope	2	A
Dispensary	8-3	Examination Bed	2	A
Dispensary	NA	Negatoscope	1	C
Dispensary	8-1	Bed	2	C
Pharmacy Unit	7-2	Electronic Calculator	10	C
Program Management	1-1	Computer Complete Set	1	B
Program Management	1-1	Computer Desk	1	B
Program Management	1-3	Photocopier	1	A
Technical Office	4-5	TV Complete Set	1	A
Technical Office	4-2	Camera VCR	1	A
Technical Office	4-3	Screen	1	C
Technical Office	4-2	Computer Complete Set	3	A

Department	Rm No.	Items	Requested Q'ty	Priority
Technical Office	4-4	Computer Desk	3	A
Technical Office	4-3	Overhead Projector	1	A
Technical Office	4-3	Screen	3	A
Technical Office	4-3	Slide Projector	1	A
Technical Office	4-3	TV Complete Set	1	C
Technical Office	4-3	Video Camera Set	1	C
Administration Office	2-2	Typewriter Table	1	A
Administration Office	2-2	Typewriter, Khumer Machine	1	A
Laboratory Unit	5-*	Laboratory Table	*	A
Laboratory Unit	5-*	Lab Table, Center w/ Sink	*	A
Laboratory Unit	5-*	Lab Table, Side w/o Drawers	*	A
Laboratory Unit	5-*	Lab Table, Side w/ Drawers	*	A
Laboratory Unit	5-*	Lab Table, w/ Unit Sink	*	A
Laboratory Unit	5-3	Incubator	1	A
Laboratory Unit	5-2-1	Pharmaceutical Refrigerator	1	A
Laboratory Unit	5-2-1	Refrigerator	1	A
Laboratory Unit	5-3	Deep Freezer	1	A
Laboratory Unit	5-4	Distilling Apparatus	2	A
Laboratory Unit	5-5	Screen for OHP	1	C
Technical Office	4-5	Sound System	1	A
Technical Office	4-5	Projector for Computer	1	A
Technical Office	4-2	Printing Machine	1	A
Technical Office	4-3	White Board	2	A
Technical Office	4-3	Projector	1	A
Laboratory Unit	5-*	Chairs for Lab Tables	*	A
X-ray Unit	6-5	Negatoscope (Large)	1	A

Note Rm No. : Refer to ANNEX-1
NA : Not Applicable
* : Quantity and rooms to be decided based on the laboratory planning

Japan's Grant Aid Scheme

1. Grant Aid Procedures

1) Japan's Grant Aid Program is executed through the following procedures.

Application	(Request made by a recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by Cabinet)
Determination of Implementation	(The Notes exchanged between the Governments of Japan and the recipient country)

2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. Basic Design Study

1) Contents of the Study

The aim of the Basic Design Study (hereafter referred to as "the Study"), conducted by JICA on a requested project (hereafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Japanese Government. The contents of the Study are as follows:

a) Confirmation of the background, objectives, and benefits of the requested Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
c) Confirmation of items agreed on by both parties concerning the basic concept of the Project.
d) Preparation of a basic design of the Project
e) Estimation of the costs of the Project

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid Project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations in the recipient country through the Minutes of Discussions.

2) Selection of Consultants

For the smooth implementation of the Study, JICA uses (a) registered consultant firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms. The firm(s) selected carry (ies) out the Basic Design Study and write(s) a report, based upon terms of reference set by JICA. The consulting firm(s) used for the Study which is (are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.

3. Japan's Grant Aid Scheme

1) What is Grant Aid ?

The Grant Aid Program provides a recipient country with non-reimbursable funds needed to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under the principals in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

3) "The period of the Grant Aid" means the one fiscal year in which the Cabinet approves the Project for. Within the fiscal year, all procedure such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed. However in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

4) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When both Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of the third country.

However the prime contractors, namely, consulting contracting and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or

M. S.

Japanese corporations controlled by persons of Japanese nationality.)

5) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

6) Undertakings required of the Government of recipient country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as the following:
a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.
b) To provide facilities of the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.
c) To secure buildings prior to the procurement in case the installation of the equipment.
d) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.
e) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts.
f) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

7) "Proper Use"

The recipient country is required to maintain and use the facilities constructed and the equipment purchased under the Grant Aid properly and effectively and to assign the necessary staff for operation and maintenance of them as well as to bear all the expenses other than those covered by the Grant Aid.

8) "Re-export"

The products purchased under the Grant Aid shall not be re-exported from the recipient country.

9) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

M. S.

ANNEX-4

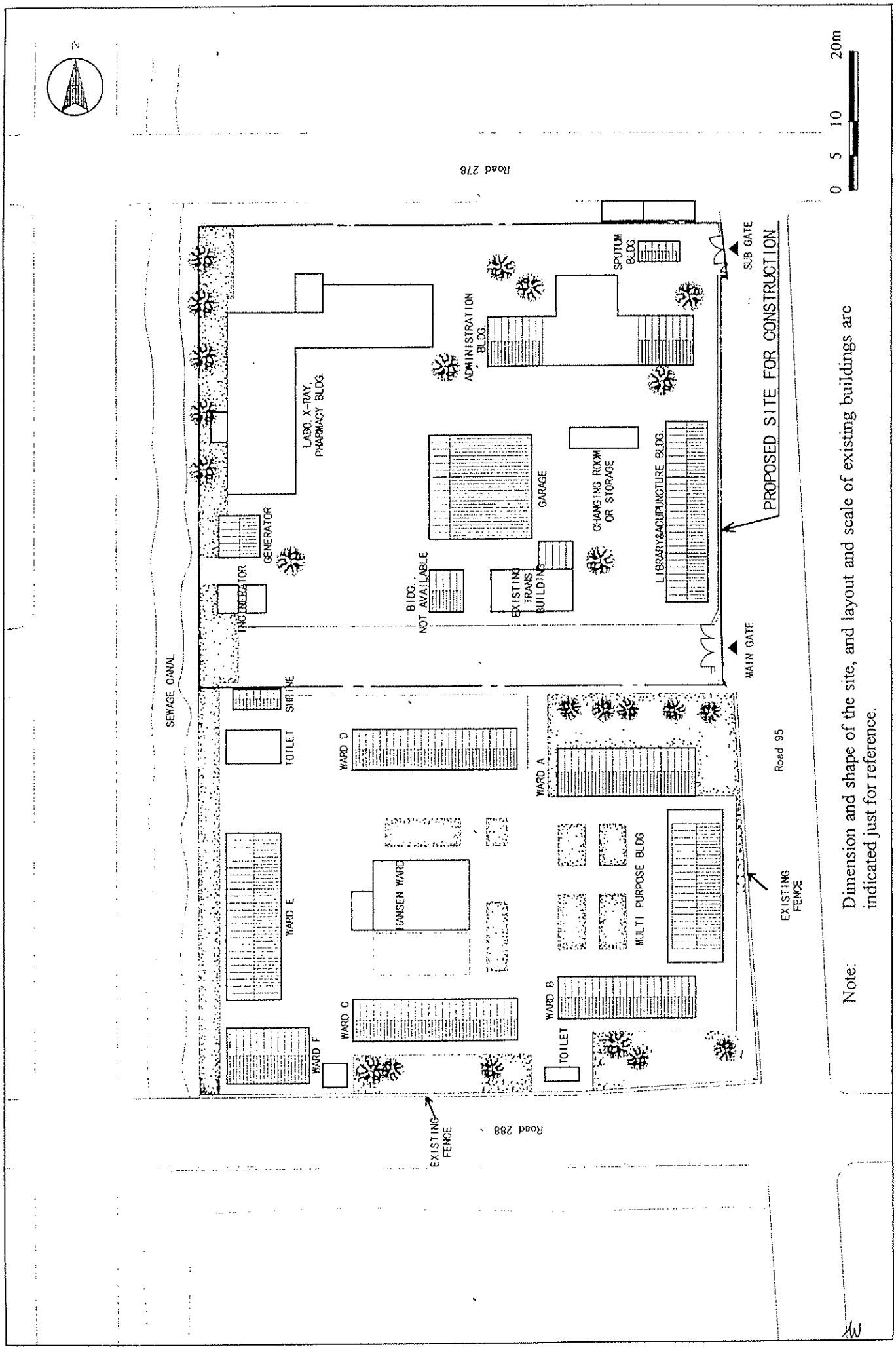
Major Undertakings to be taken by Each Government

NO	Items	To be covered by Japanese side	To be covered by Cambodian side
1	To secure land		●
2	To clear, level and reclaim the site when needed		●
3	To construct gates and fences in and around the site		●
4	To construct the parking lot	●	
5	To construct roads		
	1) Within the site	●	
	2) Outside the site		●
6	To construct the building	●	
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities		
	1)Electricity		
	a. The distributing line to the site		●
	b. The drop wiring and internal wiring within the site	●	
	c. The main circuit breaker and transformer	●	
	2)Water Supply		
	a. The city water distribution main to the site		●
	b. The supply system within the site (receiving and/or elevated tanks)	●	
	3)Drainage		
	a. The city drainage main (for storm, sewer and others) to the site		●
	b. The drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the site	●	
	4)Gas Supply		
	a. The gas supply to the facility		●
	b. The gas supply system within the facility	●	
	5)Telephone System		
	a. The telephone trunk line to the main distribution frame / panel (MDF) of the building		●
	b. The MDF and the extension after the frame / panel	●	
	6)Furniture and Equipment		
	a. General furniture		●
	b. Project equipment	●	
8	To bear the following commissions to a bank of Japan for the banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
9	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country		
	1) Marine(Air) transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and customs clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	(●)	(●)

M. S.

10	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
11	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract		●
12	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid		●
13	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for construction of the facilities as well as for the transportation and installation of the equipment		●

The map of the project site



Note: Dimension and shape of the site, and layout and scale of existing buildings are indicated just for reference.

MINUTES OF DISCUSSIONS
ON BASIC DESIGN STUDY
ON THE PROJECT FOR IMPROVEMENT OF THE NATIONAL TUBERCULOSIS CENTER
IN THE KINGDOM OF CAMBODIA
(EXPLANATION ON DRAFT REPORT)

In April, 1999, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Basic Design Study Team on the Project for Improvement of the National Tuberculosis Center (hereinafter referred to as "the Project") to the Kingdom of Cambodia (hereinafter referred to as "Cambodia"), and through discussion, field survey, and technical examination of the results in Japan, JICA prepared a draft report of the Study.

In order to explain and to consult the Cambodian side on the components of the draft report, JICA sent to Cambodia the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Dr. Masashi Suchi, Chief, Project Development and Management Division, Department of International Cooperation, The Research Institute of Tuberculosis, Japan Anti-Tuberculosis Association from July 14 to August 4, 1999.

As a result of discussions, both parties confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare the Basic Design Study Report.

Phnom Penh, July 28, 1999

Dr. Masashi Suchi
Leader
Draft Report Explanation Team
Japan International Cooperation Agency

Dr. Mam Bunheng
Secretary of State for Health
Ministry of Health

ATTACHMENT

1. Components of the Draft Report

The Government of Cambodia agreed and accepted in principle the components of the draft report explained by the Team. The finally agreed lists of facilities and equipment are attached to ANNEX-I and ANNEX-II.

2. Japan's Grant Aid scheme

The Cambodian side understands the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Cambodia as explained by the Team and described in ANNEX-3 and ANNEX- 4 of the Minutes of Discussions signed by both sides on April 9, 1999.

3. Schedule of the Study

3-1. The consultants will proceed to further examination of the study results in Japan by October, 1999.

3-2. JICA will prepare the draft final report in English and dispatch a mission in order to explain its contents in October, 1999.

3-3. Based on the results of discussions of the draft report, JICA will complete the final report and send it to the Government of Cambodia by January, 2000.

4. Other relevant issues

4-1. The Cambodian side shall complete the implementation of the following undertakings by the commencement of the construction: (a) rearrangement of the existing wards, preparation for the temporary facilities and movement of equipment from the existing buildings to the temporary facilities, (b) demolishing and clearance of the existing buildings and utilities within the site for construction shown in ANNEX-III, (c) leveling of ground in the site for construction, and (d) relocation of the existing electricity substation including cable works.

4-2. The Cambodian side shall provide utilities necessary for the new building, such as electricity, water supply, drainage, telephone line, to the site for construction at the adequate time during the construction.

4-3. The Cambodian side shall ensure enough budget and personnel to operate and maintain the facilities and equipment after the completion of the construction.

Required Rooms for Facility

Division		Rooms
1) Program Management Office	1-1	Director's office
	1-2	Vice director's office
	1-3	Secretary room
	1-4	JICA expert office
	1-5	Advisors office
	1-6	Reception space
	1-7	Storage- 6
2) Administration Office	2-1	Administration office
3) Accounting Office	3-1	Accounting office
	3-2	Storage- 1
	3-3	Storage- 4
4) Technical Office	4-1	Technical office
	4-2	Statistics & Planning room
	4-3	Library
	4-4	Classroom-1,2
	4-5	Classroom-3
	4-6	Meeting room
	4-7	Storage- 3
	4-8	Storage- 5
5) Dispensary	5-1	Dispensary staff room
	5-2	Reception room
	5-3	Consultation room- 1
	5-4	Consultation room- 2
	5-5	Consultation room- 3
	5-6	Patients education room
	5-7	Waiting lobby
	5-8	Physiotherapy room
	5-9	Home care DOTS office
6) X-ray Unit	6-1	X-ray staff room
	6-2	Reading room
	6-3	Dark room
	6-4	X-ray room
	6-5	Operation room
	6-6	Waiting lobby
	6-7	Bronchoscope & ECG room
7) Laboratory Unit	7-1	Laboratory staff room
	7-2	Research laboratory
	7-3	Ante room
	7-4	Sterilization room
	7-5	Training laboratory
	7-6	Preparation room
	7-7	Laboratory storage
	7-8	Laboratory
	7-9	Smear examination laboratory
	7-10	Sputum collection space
	7-11	Blood collection room
	7-12	Reagent preparation room
	7-13	Reagent storage
8) Pharmacy Unit	8-1	Pharmacy office
	8-2	Drug storage
	8-3	Medical material storage
	8-4	TB drug distribution room
	8-5	Pharmacy
9) Garage and Driver Unit	9-1	Garage
	9-2	Drivers room
	9-3	Toilet for drivers
10) Others	10-1	Laundry
	10-2	Machine room
	10-3	Security room
	10-4	Toilet for out-patients
	10-5	Toilet for disabled people
	10-6	Toilet for staff
	10-7	Kitchen
	10-8	Storage- 2
	10-9	Common space (Corridors. Stairs and others)

Note: 1. Both sides confirm that the facility mentioned above includes the necessary utilities such as electricity and water.
2. The size and capacity of the facility will be determined after further studies.

M. S.

EQUIPMENT LIST

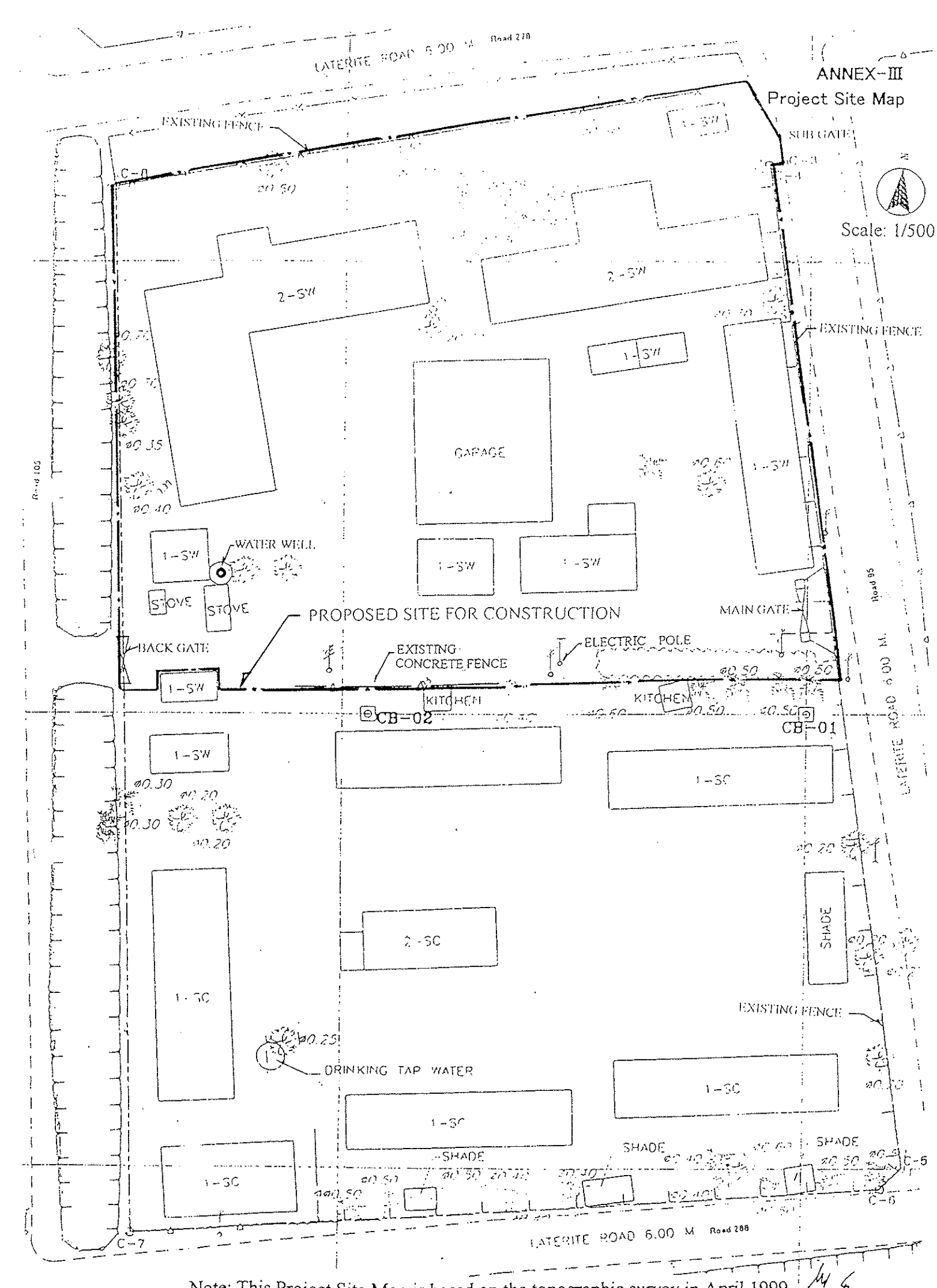
Department	Rm. No.	Item No.	Items	Q'ty set(s)
Administration Office	2-1	AO- 1	Typewriter Table	1
Administration Office	2-1	AO- 2	Typewriter, Khmer	1
Administration Office	2-1	AO- 3	Typewriter, English	1
Administration Office	2-1	AO- 4	Typewriter Table	1
Dispensary	5-1	DP- 1	TV Complete Set	1
Dispensary	5-4, 5-5, 5-6	DP- 2	Negatoscope	3
Dispensary	5-4, 5-5, 5-6	DP- 3	Examination Bed	3
Laboratory Unit	7-*	LU- 1	Laboratory Table	1
Laboratory Unit	7-*	LU- 2	Lab Table, Center w/ Sink	1
Laboratory Unit	7-*	LU- 3	Lab Table, Side w/o Drawers	1
Laboratory Unit	7-*	LU- 4	Lab Table, Side w/ Drawers	1
Laboratory Unit	7-*	LU- 5	Lab Table, w/ Unit Sink	1
Laboratory Unit	7-2	LU- 6	Incubator	1
Laboratory Unit	7-8	LU- 7	Pharmaceutical Refrigerator	1
Laboratory Unit	7-8	LU- 8	Refrigerator	1
Laboratory Unit	7-2	LU- 9	Deep Freezer	1
Laboratory Unit	7-6, 7-8	LU- 10	Distilling Apparatus	2
Laboratory Unit	7-*	LU- 11	Chairs for Lab Tables	1
Laboratory Unit	7-6	LU- 12	Safety Cabinet	2
Laboratory Unit	7-1	LU- 13	White Board	1
Laboratory Unit	7-5	LU- 14	White Board	1
Laboratory Unit	7-5	LU- 15	Over Head Projector	1
Program Management	1-3	PM- 1	Photocopier	1
Technical Office	4-7	TO- 1	TV Complete Set	1
Technical Office	4-1	TO- 2	Camera VCR	1
Technical Office	4-2	TO- 3	Computer Complete Set	3
Technical Office	4-2	TO- 4	Computer Desk	3
Technical Office	4-7	TO- 5	Overhead Projector	1
Technical Office	4-7	TO- 6	Screen	3
Technical Office	4-7	TO- 7	Slide Projector	1
Technical Office	4-7	TO- 8	Sound System	1
Technical Office	4-7	TO- 9	Projector for Computer	1
Technical Office	4-1	TO- 10	Printing Machine	1
Technical Office	4-7	TO- 11	White Board	2
Technical Office	4-7	TO- 12	Projector	1
X-ray Unit	6-3	XU- 1	Drying & Developing Machine	1
X-ray Unit	6-2	XU- 2	Negatoscope	2
X-ray Unit	6-7	XU- 3	Negatoscope	1
X-ray Unit	6-4, 6-5	XU- 4	X-ray Unit w/Bucky Table	1
X-ray Unit	4-7	XU- 5	Negatoscope	1

Note Rm. No. : Refer to ANNEX-I

* : includes lab tables and chairs for entire Lab Unit

ANNEX-III

Project Site Map



Note: This Project Site Map is based on the topographic survey in April 1999.

MINUTES OF DISCUSSIONS
ON BASIC DESIGN STUDY
ON THE PROJECT FOR IMPROVEMENT OF THE NATIONAL TUBERCULOSIS CENTER
IN THE KINGDOM OF CAMBODIA
(EXPLANATION ON DRAFT FINAL REPORT)

In July, 1999, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Draft Report Explanation Team on the Project for Improvement of the National Tuberculosis Center (hereinafter referred to as "the Project") to the Kingdom of Cambodia (hereinafter referred to as Cambodia), and through discussion, field survey, and technical examination of the study results in Japan, JICA prepared a draft final report of the study.

In order to explain and to consult the Cambodian side on the components of the draft final report, JICA sent to Cambodia the Draft Final Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Dr. Masashi Suchi, Chief, Project Development and Management Division, Department of International Cooperation, The Research Institute of Tuberculosis, Japan Anti-Tuberculosis Association from October 25 to November 11, 1999.

As a result of discussions, both parties confirmed the main items described on the attached sheet.

Phnom Penh, November 4, 1999

Dr. Masashi Suchi
Leader
Draft Final Report Explanation Team
Japan International Cooperation Agency

Dr. Mam Bunheng
Secretary of State for Health
Ministry of Health

ATTACHMENT

1.Components of the Draft Final Report

The Government of Cambodia agreed and accepted in principle the components of the draft final report explained by the Team.

2.Japan's Grant Aid scheme

The Cambodian side understands the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Cambodia as explained by the Team and described in Annex-3 and Annex-4 of the Minutes of Discussions signed by both parties on April 9, 1999.

3.Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to the Government of Cambodia by January, 2000.

4.Other relevant issues

4-1. The National Tuberculosis Center shall be responsible for the results of the execution of the Project on the basis of all documents and drawings prepared as a result of the study.

4-2. The Cambodian side agreed to implement the undertakings, which are described in the Minutes of Discussions signed by both parties on July 28, 1999.

4-3. The Cambodian side shall ensure enough budget and personnel to operate and maintain the facilities and equipment after the completion of the construction.

Extent of Works (DRAFT)

Portions by the Japanese Side	**Portions by the Cambodian Side**	**Required Budget** (Rough Estimation, US$)
(1) Building Works Structure works, finishing works (2) Electrical Works Power • trunk facilities, lighting, power outlets, P/A systems (3) Utilities and Facilities a) Water Supply Construction works for the Water supply from the valve at the water supply meter to the building and all the related internal works for the water supply. b) Sewerage system including piping works up to the connection manhole c) Sanitation facilities (waste water treatment facility) d) Elevated tank and reserve tank e) Fire-extinguishing facilities f) Electrical Cabling works g) Telecommunication system Cabling works from MDF/PABX to the facilities, including installation of conduit. h) Lightning Protection System i) Lighting system in the site (4) Exterior Work Road, path and parking lots within the site (5) Equipment and Furniture Equipment and Furniture for the Project (6) Electric Room, Electric Generator Room, Pump Room	(1) <u>Site Preparation</u> a) Ground preparation including the clearance and leveling of the land, demolition of existing buildings and repairing of the existing fence. b) Temporary power and water supply for the construction (2) <u>External Works and Approach Roads</u> - Landscaping, planting, and fence, etc within the Site. (3) <u>Utilities and Facilities for New Buildings</u> a) Water Supply Construction from the main feeder to the water valve at the water supply meter including the water supply meter. b) Sewerage Piping works from the connection manhole in the site to the existing sewerage line including the repair work of the existing ditch. c) Storm Drainage Drainage line from the site to the existing line including the expansion work of the existing drainage line. d) Electrical Work Cabling works from the existing power supply point to the new Electrical room in new CENAT Building. e) Telecommunication Work Cabling work(for Direct/Extension/Public telephone) from Point Distribution to Point Distribution for new MDF/PABX in the new	(1) <u>Site Preparation</u> : a) US$23,300 - Demolition of existing buildings: US$17,000 - Site clearance and leveling: US$ 6,300 b) Existing electrical line and water supply system will be used for the construction work. (Charge for the electricity and water used for construction will be paid by Japanese side.) (2) <u>External Works and Approach Roads</u> : US$ 43,135 (Planting and landscaping : US$ 13,800, Fence around the center : US$ 29,335) (3) <u>Utilities and Facilities</u> a) US$950 b) US$950 (include c) Storm Drainage) d) US$ 49,910 (Relocation Work: US$35,000, Connection Charge: US$6,000, Cabling Work: US$6,000, Consumer Deposit: Riel 7,875,000, VAT10%: 600US$+787,500Riel) e) US$ 860 (Connection Charge including Deposit Charge: Domestic 2lines US$480, International 1 line US$ 380)

Portions by the Japanese Side	**Portions by the Cambodian Side**	**Required Budget** (Rough Estimation, US$)
	CENAT building. f) The provision of gas(LPG) cylinders for the Lab.	
	(4) Others a) Governmental works including the application and obtaining Governmental approvals and permissions b) Smooth custom clearance, tax exemptions and prompt internal transportation for the imported construction materials and equipment c) Commissions to the Japanese foreign exchange bank for its banking services based upon the Banking Arrangement namely the advising commission of the "Authorization to Pay" and payment commission	(4) Others a) b) c)
	(5) Management, operation and maintenance cost for the new building and facilities	(5)
	(6) Tax exemptions and necessary preferential treatment for the construction staff from Japan or a third country	(6)
	(7) Smooth entry , re-entry and departure of Cambodia for the Japanese technical staff	(7)
	(8) Preparation of temporary office - Renovation of existing ward buildings and construction of temporary buildings - Movement of Equipment from existing buildings to the temporary office	(8) US$ 13,690
	(9) Installation of General Furniture	(9) US$ 24,509
	(10) All the expenses, other than to be born by the Japan's Grant Aid within the scope of the Project	(10)

Total amount of required budget =US$157,304

តារាងប្រៀបធៀប ផែនការនៅលើ ការចំណាយជាក់ស្តែង ១៩៩៥-១៩៩៨

1995 -1998 EXPENDITURE COMPARED TO THE BUDGET PLAN

ឯកតាលានរៀល

ជំពូក Chapter	ពិពណ៌នា Description	1995			1996			1997			1998			1999
		ផែនការ	អនុវត្ត	ភាគរយ ធៀប នឹងផែនការ	ផែនការ	អនុវត្ត	ភាគរយ ធៀប នឹងផែនការ	ផែនការ	អនុវត្ត	ភាគរយ ធៀប នឹងផែនការ	ផែនការ	អនុវត្ត	ភាគរយ ធៀប នឹងផែនការ	ផែនការ
		Budget	Expenditure	%	Budget	Expenditure	%	Budget	Expenditure	%	Budget	Expenditure	%	Budget
		a	b	b/a	a	b	b/a	a	b	b/a	a	b	b/a	a
10	ប្រាក់បៀវត្ស Salaries	10,560.00	8,677.00	82.17	11,985.00	8,992.00	75.03	11,065.00	9,826.70	88.81	12,160.00	10,265.52	84.42	13,270.00
11	ចំណាយប្រតិបត្តិការ មិនគិតបញ្ចូល ឱសថ និង គ្រឿងបរិក្ខារពេទ្យ Operating costs exclude Drugs	16,764.00	16,549.00	98.72	23,228.00	13,602.00	58.56	23,931.00	11,230.00	46.93	21,496.00	11,794.40	54.87	29,355.00
11	ឱសថ និង គ្រឿងផ្គត់ផ្គង់វេជ្ជសាស្ត្រ Drugs & medical supplies	8,361.00	523.00	6.26	22,422.00	18,644.00	83.15	23,069.00	21,094.30	91.44	25,260.00	20,505.75	81.18	32,874.00
13	កិច្ចព្រមព្រៀងលើកម្មវិធីពិសេស Special Programme Agreement ADD	-	-	-	2,040.00	591.00	-	2,040.00	598.80	-	2,640.00	439.82	16.66	3,000.00
31	ប្រាក់ឧបត្ថម្ភសង្គម Social allowances	255.00	139.00	54.51	615.00	184.00	29.92	640.00	185.80	29.03	808.00	545.59	67.52	1,317.00
32	អង្គការអន្តរជាតិ International Organiszations	640.00	640.00	100.00	110.00	109.00	99.09	-	-	-	-	-	-	300.00
	សរុប[illegible] Sub[illegible]	36,580.00	26,528.00	72.5205	60,400.00	42,122.00	69.7384	60,745.00	42,935.60	70.6817	62,364.00	43,551.07	69.8337	80,116.00
50.01	វិនិយោគ-សំណង់ និង បរិក្ខារ Investment-construction & equipment	3,900.00	197.00	5.05	11,600.00	225.00	1.94	9,124.40	9,124.40	100.00	672.42	672.42	100.00	
50.02	វិនិយោគ-ចំណែកបដិភាគ Investment-counterpart contribution to loans	250.00	-	-	625.00	366.00	58.56	1.20	1.20	100.00	1,382.60	1,382.60	100.00	
	សរុបវិនិយោគ Investment [illegible]	4,150.00	197.00	4.746988	12,225.00	591.00	4.83436	9,125.60	9,125.60	100	2,055.02	2,055.02	100	[illegible]
	សរុប (មូលនិធិចំណាយតាមរយៈរតនាគារ) TOTAL	40,730.00	26,725.00	65.62	72,625.00	42,713.00	58.81	69,870.60	52,061.20	74.51	64,419.02	45,600.09	70.79	80,116.00

តារាងស្ថានភាពចំណាយថវិកា ឆ្នាំ ១៩៩៨ (ខេត្ត ក្រុង) ឯកតា លាន

Chapter 10 Salaries					
N°	Province	Budget	xpenditure 12mont	Total	%
1	Phnom Penh	578.7	466.3	466.3	80.6%
2	Kandal	731.0	618.0	618.0	84.5%
3	Kg Cham	953.6	847.1	847.1	88.8%
4	Battambang	848.4	643.6	643.6	75.9%
5	Prey Veng	634.8	574.8	574.8	90.5%
6	Siem Rieng	563.2	346.8	346.8	61.6%
7	Kg Thom	471.2	413.9	413.9	87.8%
8	TaKeo	483.3	386.8	386.8	80.0%
9	Svay Rieng	381.7	300.5	300.5	78.7%
10	Pursat	378.5	362.0	362.0	95.6%
11	Kg Chhnang	412.0	349.7	349.7	84.9%
12	Kg Speu	469.6	373.8	373.8	79.6%
13	Kampot	530.5	370.6	370.6	69.9%
14	Kg Som	191.0	178.3	178.3	93.4%
15	Koh Kong	105.9	105.9	105.9	100.0%
16	Preah Vihear	159.3	114.8	114.8	72.0%
17	Kratie	282.9	204.1	204.1	72.1%
18	Ratanakiri	178.8	90.3	90.3	50.5%
19	Modolkiri	107.4	158.3	158.3	147.4%
20	Banteay Meanchey	625.3	451.4	451.4	72.2%
21	Stung Treng	202.0	150.9	150.9	74.7%
22	Kep Ville	20.9	17.9	17.9	85.8%
	Total	9,310.0	7,525.8	7,525.8	80.8%

តារាងស្ថានភាពចំណាយថវិកា ឆ្នាំ ១៩៩៨ (ខេត្ត ក្រុង) ឯកតា លាន

Chapter 11 Operating Costs					
N°	Province	Budget	Expenditure	Total	%
1	Phnom Penh	716.0	167.3	167.3	23.37%
2	Kandal	1,045.7	306.2	306.2	29.29%
3	Kg Cham	1,651.8	769.7	769.7	46.60%
4	Battambang	1,065.9	411.4	411.4	38.59%
5	Prey Veng	1,127.4	233.2	233.2	20.69%
6	Siem Rieng	911.7	226.4	226.4	24.84%
7	Kg Thom	747.9	166.5	166.5	22.26%
8	TaKeo	754.4	209.4	209.4	27.75%
9	Svay Rieng	578.2	151.2	151.2	26.15%
10	Pursat	455.5	202.8	202.8	44.52%
11	Kg Chhnang	541.8	183.5	183.5	33.86%
12	Kg Speu	553.8	113.2	113.2	20.44%
13	Kampot	689.9	265.1	265.1	38.42%
14	Sihanouk Ville	270.0	99.9	99.9	37.00%
15	Koh Kong	185.0	37.6	37.6	20.33%
16	Preah Vihear	271.4	149.8	149.8	55.21%
17	Kratie	393.0	115.3	115.3	29.34%
18	Ratanakiri	187.5	87.3	87.3	46.57%
19	Modolkiri	110.8	62.9	62.9	56.75%
20	Banteay Menchey	860.0	331.5	331.5	38.55%
21	Stung Treng	244.7	147.2	147.2	60.15%
22	Kep Ville	47.6	10.2	10.2	21.42%
	Total	13,410.0	4,447.6	4,447.6	33.17%

តារាងស្ថានភាពចំណាយថវិកា ឆ្នាំ ១៩៩៨ (ខេត្ត ត្រួច) ឯកត្តា លាន

Chapter 31 Operating Costs					
N°	Province	Budget	Expenditure	Total	%
1	Phnom Penh	26.0	03.8	03.8	14.64%
2	Kandal	26.0	22.7	22.7	87.27%
3	Kg Cham	30.0	12.2	12.2	40.76%
4	Battambang	30.0	09.0	09.0	29.87%
5	Prey Veng	30.0	03.5	03.5	11.66%
6	Siem Rieng	25.0	02.3	02.3	9.00%
7	Kg Thom	24.0	14.4	14.4	60.19%
8	TaKeo	24.0	22.9	22.9	95.44%
9	Svay Rieng	20.0	05.1	05.1	25.73%
10	Pursat	20.0	01.3	01.3	6.48%
11	Kg Chhnang	20.0	07.1	07.1	35.49%
12	Kg Speu	20.0	03.0	03.0	14.83%
13	Kampot	20.0	02.4	02.4	12.05%
14	Sihanouk Ville	10.0	07.9	07.9	79.43%
15	Kôh Kong	05.1	05.1	05.1	100.00%
16	Preah Vihear	09.0	01.6	01.6	17.92%
17	Kratie	14.0	07.2	07.2	51.39%
18	Ratanakiri	05.0	04.7	04.7	94.00%
19	Modolkiri	09.0	05.5	05.5	60.58%
20	Banteay Menchey	29.6	00.8	00.8	2.56%
21	Stung Treng	10.6	10.1	10.1	94.87%
22	Kep Ville	00.7	00.7	00.7	100.00%
	Total	408.0	153.2	153.2	37.55%

PUBLIC INVESTMENT PROGRAMS: SUMMARY OF FINANCIAL PLAN FOR HEALTH SECTOR

		1998	1998	1999	2000	2001	2002	2000-2002	2000-2002
		Budget	Actual	Budget	Estimate	Estimate	Estimate	US$000	%
A	**TOTAL COSTS**	**93,781**	**54,945**	**122,761**	**144,239**	**166,020**	**193,347**	**503,607**	**100.0%**
	Current Expenditure	27,016	15,794	47,079	66,237	89,905	112,824	268,967	53.4%
	Capital Expenditure	66,764	39,152	75,682	78,002	76,115	80,523	234,640	46.6%
B	**IDENTIFIED FUNDING SOURCES**	**68,697**	**54,945**	**95,132**	**102,525**	**117,843**	**147,713**	**367,621**	**100.0%**
	Self-generating revenue	57	57	1,120	1,175	1,545	1,936	4,656	1.3%
	Government Financing	16,855	12,324	29,332	40,400	66,801	98,540	204,984	55.8%
	Loans	9,124	3,628	11,190	12,525	11,225	9,425	33,473	9.1%
	Grant	42,661	38,936	53,490	48,426	38,271	37,811	124,508	33.9%
C	**FUNDING Gap (A-B)**	**25,084**	**0**	**27,629**	**41,715**	**48,178**	**45,635**	**135,986**	
D	**FUNDING Gap (C/A) in %**	**26.7%**	**0.0%**	**22.5%**	**28.9%**	**29.0%**	**23.6%**	**27.0%**	

Government Budget Devoted to Health Sector and Macro-economic Trend

	1998		1999	2000	2001	2002
Population in thousand inhabitants	11,300		11,600	11,900	12,233	12,575
Nominal GDP in Million US$	2,973		3,600	4,094	4,490	4,904
Nominal GDP per capita in US$	282		427	450	500	550
Exchange rate (riel per US$)	3,700		3,500	3,500	3,500	3,500
Health Budget as % to GDP	**0.57%**		**0.81%**	**0.99%**	**1.49%**	**2.01%**
Health Budget in US$ per capita	1.49		2.53	3.39	5.46	7.84

File name: INV_FN14.xls

※Public Investment Program 2000-2002 より

Sheet name: Summary

PUBLIC INVESTMENT PROGRAMS 2000-2002 : FUNDING SOURCES (IN THOUSAND US$)

	PROJECT AREA	Cost	Funding Source				Full Gap	Gap (% to cost)
			Govt. financing	Loan	Grant	Total identified		
	Revitalising basic health service	*339,746*	*179,512*	*26,467*	*101,296*	*307,276*	*32,470*	*9.6%*
1	Strengthening Health Management and Planning (SH3)	61,899	31,376		19,152	50,528	11,371	18.4%
2	Strengthening Basic Health Services (BH1)	268,003	147,537	25,503	81,950	254,991	13,012	4.9%
3	Human Resource Development (HR4)	6,972	449	964	194	1,607	5,365	76.9%
4	Infection Control (IN12)	2,872	150			150	2,722	94.8%
	Priority Program for delivery through revitalising Basic Health service	*109,755*	*6,381*	*6,321*	*13,871*	*26,573*	*83,181*	*4*
5	Tuberculosis Control (TB5)	11,831	510	878	2,321	3,709	8,122	68.7%
6	Control of Malaria , Dengue Heamorrhagic Fever & Schistosomiasis (MA6)	8,155	1,000	2,187	2,300	5,487	2,668	32.7%
7	Reform of Pharmaceutical Sector/Provision of Essential Drugs & Consummables (ED7)	10,532	2,450			2,450	8,082	76.7%
8	AIDS/STDs (AI9)	41,988	431	3,256	2,220	5,907	36,081	85.9%
9	Expanded Program on Immunization and Polio Eradication (EPI14)	10,782	490		1,200	1,690	9,092	84.3%
10	Women and Child Health (MC2)	26,467	1,500		5,830	7,330	19,137	72.3%
	Emerging Priorities	*28,563*	*2,326*	*334*	*5,213*	*7,484*	*21,079*	
11	Medical Speciality for Ent, Oral & Mental Care (NO15)	4,884	970		1,524	2,494	2,390	48.9%
12	Development of National Institute of Public Health (NIPH16)	4,845	426	334	1,400	2,160	2,685	55.4%
13	Elimination of Leprozy Case (LEP11)	2,532			1,116	1,116	1,416	55.9%
14	Development Health Education, Hygiene and Primary Health Care (HEP18)	4,376	471		1,173	1,644	2,732	62.4%
15	Cancer Prevention Program (CPP19)	820	70			70	750	91.5%
16	Prevention of Blindness	4,399					4,399	
17	Strenthening the National Laboratory for Controling food and drug administration	6,707	389				6,707	
	Rehabilitation of National Hospitals and Expension Provincial Blood Bank Centers	*25,543*	*5,137*	*350*	*4,050*	*9,538*	*16,006*	*62.7%*
18	Blood transfusion Program (BLO17)	3,545	337	350		688	2,857	80.6%
19	Rehabilitation of National Hospitals (NH10)	21,998	4,800		4,050	8,850	13,148	59.8%
	Total approved by RGC	*503,607*	*193,356*	*33,473*	*124,430*	*350,871*	*152,736*	*30%*
			55%	*10%*	*35%*	*100%*		

※Public Investment Program 2000-2002 より

GLOBAL VIEW ON INVESTMENT FOR HEALTH 192000-2002

1000 USD

Investment Cost		1998		1999	2000	2001	2002	3yr Total	Running cos
		Budget	Actual	Budget	Estimate	Estimate	Estimate	2000-2002	
Current Expenditure		27,016	15,794	47,079	66,237	89,905	112,824	268,967	100,768
1	Salaries	4,189	3,090	4,981	9,788	18,432	27,034	55,180	27,034
2	Material + Administration	12,275	5,839	21,873	26,295	35,568	45,602	107,324	45,602
3	Drug & Supplies	9,464	6,523	16,089	18,676	24,199	28,132	71,432	28,132
4		39	39	288	7,572	7,599	7,610	22,574	7,610
5				296	559	579	629	1,371	629
6				70	75	95	110	145	110
7				55	50	60	70	105	70
8									
9									
10	Others (not specified)	1,050	302	3,427	3,222	3,373	3,637	9,899	3,637
Capital Expenditure		66,764	39,152	75,682	78,002	76,115	80,523	234,640	
TOTAL COSTS		93,781	54,945	122,761	144,239	166,020	193,347	503,607	100,768
FUNDING SOURCES		1998		1999	2000	2001	2002	3yr Total	81,701
		Budget	Actual	Budget	Estimate	Estimate	Estimate	2000-2002	
Goods & Services		57	57	1,120	1,175	1,545	1,936	4,656	1,936
(self-generating revenue)		57	57	1,120	1,175	1,545	1,936	3,156	
Government Funding		25,978	15,952	40,195	52,925	78,027	108,411	239,363	79,765.3
1	World Bank* (CDC/HDP proj	5,424	2,026	6,705	8,039	6,740	4,940	19,732	
2	ADB (Basic Health Service)	3,700	1,602	4,486	4,486	4,486	4,486	13,742	
3	50.2. Counterpart fund	771	374	1,429	1,429	4,857	5,714	12,100	
4	Chapter 50.1	500	182	6,122	6,122	9,959	13,061	28,567	
5	Others Government funding	16,355	11,769	21,781	32,849	51,985	79,765	164,318	79,765
Donor Funding		42,661	38,936	53,490	48,426	38,271	37,811	124,508	
TOTAL REVENUE		63,697	54,945	91,625	99,895	116,374	146,855	363,123	80,215
FUNDING REQUIRED		25,084	0	30,848	32,708	36,943	36,248	105,898	20,553
Funding required: % To total cost		26.7%	0.0%	25.1%	22.7%	22.3%	18.7%	21.0%	20.4%

※Public Investment Program 2000-2002 より

5 Tuberculosis Control (TBS)

PIP n°.....

1000 USD

Investment Cost	1998 Budget	1998 Actual	1999 Budget	2000 Estimate	2001 Estimate	2002 Estimate	3yr Total 2000-2002	Running cost
Current Expenditure			1,926	2161	2307	2623	7091	1,350
1 Salaries			60	41	57	63	161	63
2 Material + Administration			37	123	136	149	408	149
3 Drug Lab. & Medical Supplies			832	898	1002	1138	3038	1,138
4 Patient Food								
5 Ambul. Treatment								
6 Med. Materials								
7 Maintenance								
8 Supplies andReagents								
9 IEC								
10 Others (not specified)			997	1099	1112	1273	3484	1,273
Capital Expenditure			2,496	3710	526	504	4740	
1 Construction(repair)			50	150	50		200	
2 Consultancy (ie: TA)			160	63	68	74	205	
3 Equipment + Furniture			80	71	73	75	219	
4 Training			112	293	317	337	947	
5 Survey/Pro. Prep								
6 Meeting abroad								
7 Lab. improving								
8 Transportation								
9 Lung disease Inst.			2,000	3000			3000	
10								
11 Others (not specified)			94	133	18	18	169	
TOTAL COSTS			4,422	5871	2833	3127	11831	1,350
FUNDING SOURCES	1998 Budget	1998 Actual	1999 Budget	2000 Rev Est	2001 Rev Est	2002 Rev Est	3yr total 2000-2002	200
Goods & Services								
(self-generating revenue)								
Government Funding			672	818	370	200	1388	200.0
1 World Bank* (CDC/HDP projects)			542	678	200		878	
2 ADB (Basic Health Service)								
3 50.2. Counterpart fund								
4 Chapter 50.1								
5 Others Government funding			130	140	170	200	510	200
Donor Funding			839	769	774	778	2321	
1 WHO								
2 JICA								
3 WFP								
4 MSF								
5 KFW								
6 ODA								
7								
8 NGOs								
9 Others (not specified)			839	769	774	778	2321	778
TOTAL REVENUE			1,511	1587	1144	978	3709	200
FUNDING REQUIRED			2,911	4284	1689	2149	8122	1,150
Share required: % To total cost	#DIV/0!	#DIV/0!	65.8%	73%	60%	69%	69%	85.2%

Funding required = total cost - total revenue

Submission authorised

SECRETARY OF STATE

(Signature) Date

Dr MAM BUNHENG

Director General

Dr. ENG-HUOT

Program Manager

DR. KONG KIM SAN

※Public Investment Program 2000-2002 より

ANALYSIS OF TRAINING CURRICULUM AND FACILITY PLANING

		Program				Type of meeting room				Number of days for use of each meeting rooms (Assumption)												
		Pers.	Days	No./yr	Grouping	A	B	C	others	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1	National TB Programme annual conferrence	200	3	1	2,3																	0
2	Provincial TB supervisor workshops	60	2	3	2,3	**A**	B		L						2			2			2	6
3	Training for Medical staff in TB	25	5	12	(2,3)	**A**	B	**C**		5	5	5	5	5	5	5	5	5	5	5	5	60
4	Training for TB Lab. Supervisors	12	3	3				**C**	L						3			3			3	9
5	Training for TB Lab. Staff	12	5	20				**C**	L	5	10	10	5	10	10	5	10	10	5	10	10	100
6	Training for TB Association Quarterly Meetings	100	1	4	(2,3)	**A'**	(B)	(C)		1			1			1			1			4
7	World TB Day	200	1	1																		0
8	National Leprosy Programme annual conference	100	1	2		**A'**		(C)				2										2
9	National Leprosy Day	100	1	2		**A'**		(C)												2		2
10	Central Supervisors Meetings	30	1	12		**A**				1	1	1	1	1	1	1	1	1	1	1	1	12
11	TB/HIV working group	10	1	24				**C**		2	2	2	2	2	2	2	2	2	2	2	2	24
12	Annual workplan	20	3	1			**B**													3		3
13	Meetings for Private Practitioners	100	1	6	2,3	**A'**	B	(C)					2			2			2			6
14	Meeting with non-TB staff in public sector	100	1	6	2,3	**A'**	B	(C)					2			2			2			6
15	Meeting with NGOs, associations and community leaders	100	1	6	2,3	**A'**	B	(C)					2			2			2			6
16	HIV awareness training	50	1	3		**A**					1			1			1					3
17	HIV patient management training	30	2	3	2,3	**A**	B	C			2			2			2					6
18	Continuing Medical Education	40	1	12	2,3	**A**	B	C		1	1	1	1	1	1	1	1	1	1	1	1	12
19	Consensus workshops	60	1	3	4,5	**A**	B	C					1		1			1				3
20	Lung Disease	30	5	1		**A**							5									5
21	Radiography Training (for faculty of Medicine students)	40	4	7		**A**			X	4	4	4		4	4					4	4	28
	Total									19	26	25	27	26	29	21	22	25	21	28	28	297

Type of rooms
A=Large size room (CR-1, 2 and 3) : 84㎡ (56seats)
B=Middle size room (CR-1 or 2) : 42.0㎡ (24seats)
C=Small room (CR-3) : 21㎡ (14seats)
A'=A+ C : 105㎡ (117seats-No desk)

Legends(Type of rooms for use)
ABC : To be used mainly
ABC : To be used for Group Discussions
()= Will be separated into some groups
L=Laboratory
X=X-ray room

Number of days for use of each meeting rooms per month

A	12	16	13	20	16	14	14	12	10	14	13	13	167
B	6	8	6	13	8	9	12	8	9	12	9	8	108
C	13	20	18	14	20	**22**	13	20	**22**	13	18	**21**	214
(A')	(1)	(0)	(2)	(7)	(0)	(0)	(7)	(0)	(0)	(7)	(2)	(0)	(26)

*Bold numbers : They're more than 21days, so it needs to use another meeting room and arrange the schedule.

CENAT courses and meetings plan 1999 - 2002

Event	People	Days	No. per year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Dormitory
1999																
National Tuberculosis Programme annual conference	200	3	1													42
Provincial TB supervisor workshops	60	2	3													42
Training for medical staff in TB	25	5	4													18
Training for medical staff in TB	25	3	2													18
Training for laboratory trainers	7	10	1													5
Training for TB laboratory supervisors	12	3	3													7
Training for TB laboratory staff	12	5	20													7
World TB Day	150 - 200	1	1													0
Central supervisors meetings	30	0.5	12													0
Guideline for the treatment of children	8	3	1													0
Revision of training modules	10	1	23													3
TB/HIV working group	10	0.5	16													0
Annual workplan	20	2	1													0
Meeting for private practitioners	150 - 200	0.5	1													0
Follow-up training for private practitioners	20	3	1													0
Continuing medical education	40	0.5	5													0
Lung disease	30	5	1													10
National Leprosy Programme annual conference	50	1	1													22
National Leprosy Day	150 - 200	1	1													0
Radiography training (for Faculty of Medicine students)	40	4	7													20

NOTES

1. Dormitory requirements are shown even though no accomodation is available at present.
2. The National Malaria Centre and The National Centre for Health Promotion have indicated that they have a yearly requirement for 12 days use of a conference room that can accomodate 150 - 200 people.
3. Other events suggested by the JICA technical support mission may be added to the plan .

CENAT courses and meetings plan 1999 - 2002

Event	People	Days	No. per year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Dormitory
2000 (subject to confirmation)																
National Tuberculosis Programme annual conference	200	3	1													42
Provincial TB supervisor workshops	60	2	3													42
Training for medical staff in TB	25	5	12													18
Training for TB laboratory supervisors	12	3	3													7
Training for TB laboratory staff	12	5	20													7
National TB Association quarterly meetings	100	1	4													20
World TB Day	150 - 200	1	1													0
National Leprosy Programme annual conference	150 - 200	1	1													22
National Leprosy Day	150 - 200	1	1													0
Central supervisors meetings	30	0.5	12													0
TB/HIV working group	10	0.5	24													0
Annual workplan	20	2	1													0
Meetings for private practitioners	150 - 200	0.5	3													0
Meetings with non-TB staff in public sector	150 - 200	1	3													0
Meeting with NGOs, associations and community leaders	150 - 200	1	3													0
HIV awareness training	50	1	3													0
HIV patient management training	30	2	1													10
Continuing medical education	40	0.5	12													0
Consensus workshop, side effects of TB drugs	60	1	1													0
Consensus workshop, central supervision	30	1	1													0
Consensus workshop, provincial supervision	60	1	1													42
Lung disease	30	5	1													10
Radiography training (for Faculty of Medicine students)	40	4	7													20

NOTES

1. Dormitory requirements are shown even though no accomodation is available at present.
2. The National Malaria Centre and The National Centre for Health Promotion have indicated that they have a yearly requirement for 12 days use of a conference room that can accomodate 150 - 200 people.
3. Other events suggested by the JICA technical support mission may be added to the plan .

CENAT courses and meetings plan 1999 - 2002

Event	People	Days	No. per year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Dormitory
2001 (subject to confirmation)																
National Tuberculosis Programme annual conference	200	3	1													42
Provincial TB supervisor workshops	60	2	3													42
Training for medical staff in TB	25	5	12													18
Training for TB laboratory supervisors	12	3	3													7
Training for TB laboratory staff	12	5	20													7
National TB Association quarterly meetings	100	1	4													20
World TB Day	150 - 200	1	1													0
National Leprosy Programme annual conference	150 - 200	1	1													22
National Leprosy Day	150 - 200	1	1													0
Central supervisors meetings	30	0.5	12													0
TB/HIV working group	10	0.5	24													0
Annual workplan	20	2	1													0
Meetings for private practitioners	150 - 200	0.5	3													0
Meetings with non-TB staff in public sector	150 - 200	1	3													0
Meeting with NGOs, associations and community leaders	150 - 200	1	3													0
HIV awareness training	50	1	3													0
HIV patient management training	30	2	1													10
Continuing medical education	40	0.5	12													0
Consensus workshops	60	1	3													20
Lung disease	30	5	1													10
Radiography training (for Faculty of Medicine students)	40	4	7													20

NOTES

1. Dormitory requirements are shown even though no accomodation is available at present.
2. The National Malaria Centre and The National Centre for Health Promotion have indicated that they have a yearly requirement for 12 days use of a conference room that can accomodate 150 - 200 people.
3. Other events suggested by the JICA technical support mission may be added to the plan .

CENAT courses and meetings plan 1999 - 2002

Event	People	Days	No. per year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Dormitory
2002 (subject to confirmation)																
National Tuberculosis Programme annual conference	200	3	1													42
Provincial TB supervisor workshops	60	2	3													42
Training for medical staff in TB	25	5	12													18
Training for TB laboratory supervisors	12	3	3													7
Training for TB laboratory staff	12	5	20													7
National TB Association quarterly meetings	100	1	4													20
World TB Day	150 - 200	1	1													0
National Leprosy Programme annual conference	150 - 200	1	1													22
National Leprosy Day	150 - 200	1	1													0
Central supervisors meetings	30	0.5	12													0
TB/HIV working group	10	0.5	24													0
Annual workplan	20	2	1													0
Meetings for private practitioners	150 - 200	0.5	3													0
Meetings with non-TB staff in public sector	150 - 200	1	3													0
Meeting with NGOs, associations and community leaders	150 - 200	1	3													0
HIV awareness training	50	1	3													0
HIV patient management training	30	2	3 × 4													10
Continuing medical education	40	0.5	12													0
Consensus workshops	60	1	3													20
Lung disease	30	5	1													10
Radiography training (for Faculty of Medicine students)	40	4	7													20

NOTES

1. Dormitory requirements are shown even though no accomodation is available at present.
2. The National Malaria Centre and The National Centre for Health Promotion have indicated that they have a yearly requirement for 12 days use of a conference room that can accomodate 150 - 200 people.
3. Other events suggested by the JICA technical support mission may be added to the plan .

CENAT courses and meetings plan 1999 - 2002

National Tuberculosis Programme annual conference

A 3-day conference is held in March each year for provincial health directors and provincial TB medical and laboratory supervisors. Staff working at central level also attend. The purposes of the conference are:

- to evaluate the activities of the NTP in the previous year
- to share experiences and learn from each other
- to discuss developments in TB treatment and the TB network in Cambodia
- to find solutions to problems
- to review links between the NTP and other national programmes, other parts of the public health system and the private sector.

International experts are invited to speak at the conference from organisations such as the Research Institute for Tuberculosis (Japan).

Provincial TB supervisor workshops

The annual conference is supplemented by 2-day workshops for provincial medical and laboratory supervisors in June, September and December. The workshops provide opportunities to review progress against plans, discuss and find solutions to commonly occurring problems, provide further training for provincial supervisors, and help provincial TB staff focus on objectives and problems in their areas as part of the provincial planning cycle.

Training for medical staff in TB

The courses are designed to strengthen TB activities by focusing on ways to develop the capacity of medical doctors working in operational health districts in TB case management. Some courses are for staff who have not previously received specific in-service training in TB and some are for staff who need refresher training because their previous training was some time ago or because, after field visits, supervisory staff recommend refresher training. In future it is possible that places will be offered to private sector practitioners.

Training for laboratory trainers

The laboratory manual is being re-written in 1999 and new training laboratory modules will be produced. A 10-day course will be held to up-date the five provincial TB laboratory supervisors who will be teaching the new training courses. A second objective is to improve their knowledge and technique for conducting TB microscopy training.

CENAT courses and meetings plan 1999 - 2002

Training for TB laboratory supervisors

Courses are conducted for provincial TB laboratory supervisors in order to strengthen their ability to supervise all aspects of TB microscopy. The courses include extensive practical work. A microscopy training room and a classroom are needed for these courses.

Training for laboratory staff

The course are designed to increase the knowledge of laboratory staff and improve practice. Most of the courses are for new staff but some are reserved for staff from laboratories with poor quality control results. The courses include extensive practical work. A microscopy training room and a classroom are needed for these courses.

World TB Day

World TB Day is commemorated on 24 March each year . The purpose of the event is advocacy and health education with speeches from senior politicians to an invited audience of political and community leaders and extensive press coverage.

Central supervisors meetings

Each month the central supervisors meet to review the visits to provinces made since the previous meeting in order to exchange information, explore trends and to identify and find solutions to commonly occurring problems. The meeting is also used to develop the practice of supervision.

Guideline for the treatment of children

A draft guideline for the treatment of children with TB has been prepared. In 1999, a 3-day workshop will bring together experts in paediatric TB treatment to finalise the guidance which will then be issued as a national guideline.

Revision of training modules

The TB Control training modules are being re-written in 1999 by working groups which includes staff from central and provincial levels with expert advisers. The groups will meet to review existing modules, write updated modules, plan pre-tests and make final post-test revisions.

CENAT courses and meetings plan 1999 - 2002

TB/HIV working group

A joint working group of staff from the National Tuberculosis Programme and the National AIDS Programme meets to coordinate activities relating to co-infection and the management of co-infected patients. These activities include staff training, health education and research.

Annual workplan

A workshop is organised each November to determine priorities for the following year and to prepare funding proposals for donors.

Meeting for private practitioners

In 1999, private practitioners from Phnom Penh and the surrounding area will be invited to a meeting at which the benefits of DOTS treatment for TB will be explained. The aim is to encourage private practitioners to either refer patients to the national programme more quickly or to adopt the DOTS strategy themselves.

Follow-up training for private practitioners

Following the meeting with private practitioners, a training course will be provided for those doctors who wish to adopt the DOTS strategy. The content will be similar to that for 'Training for medical staff in TB ' described above. It is possible that future training for medical staff in TB will include private as well as public sector doctors.

Continuing medical education

These meetings provide opportunities for medical staff at CENAT and other TB units in Phnom Penh to up-date their knowledge of TB control. Presentations will be made by staff and technical advisers and may be, for example, a case study, an analysis of a sample of cases, a literature review, or a report on a conference they have attended. Presentations will be followed by discussion.

Lung disease

Each year, a course is delivered by a visiting expert sponsored by Cambodian-French Cooperation. The course is designesd to improve the skills of participants in the diagnosis of TB and other lung diseases.

National Leprosy Programme annual conference

A 1-day conference is held following the National Tuberculosis Programme annual conference for provincial health directors and provincial leprosy supervisors. The conference agenda includes a review of progress made towards the elimination target in the previous year and provides for discussion on the current year's programme of activities.

National Leprosy Day

National Leprosy Day coincides with the National Leprosy Programme's annual donor conference. The event is similar in purpose and content to World TB Day - advocacy and health education with speeches from senior politicians to an invited audience of political and community leaders and extensive press coverage.

Radiography training

Each year, students from the Faculty of Medicine attend 5-day courses in radiography conducted by the CENAT staff.

National TB Association quarterly meetings

It is proposed to establish a national TB association that will bring together TB staff from the public and private health sectors, and experts from international organisations and NGOs. The association will meet quarterly to up-date and disseminate information on TB control and the TB control network in Cambodia.

Meetings with non-TB staff in public sector

Many non-TB health staff working in the private sector have received little training about TB but may come into contact with people with TB. The meetings are designed to enable and encourage these staff to recognise and refer suspect cases, and be able to support the DOTS treatment regimen.

Meetings with NGOs, associations and community leaders

NGOs, associations and community leaders such as commune chiefs, teachers and monks can play a large part in ensuring that people with TB receive and complete treatment. The meetings will give them the information they need to perform this role.

HIV awareness training

As a result of co-infection with TB and HIV, TB staff need to know about HIV and AIDS. The training is designed to increase knowledge and understanding of HIV related issues and will cover recognition of HIV and the provision of palliative care.

HIV patient management training

The HIV awareness training described above will be supplemented for staff dealing directly with co-infected patients and will provide more information on the management of these patients.

Consensus workshops

Consensus workshops will bring together experts in various aspects of TB control and treatment to discuss current topics.

Number of New TB cases all form per month in 1998

Classification of Patients	Jan.	Feb.	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
CAT I	64	58	68	55	52	82	71	60	35	61	51	49	706
CAT II	4	2	0	2	4	4	4	4	0	3	3	3	33
CAT III	4	7	3	4	8	3	5	4	3	2	8	7	58
Total	**72**	**67**	**71**	**61**	**64**	**89**	**80**	**68**	**38**	**66**	**62**	**59**	**797**
BK (+)	52	47	42	38	46	61	54	45	26	41	33	44	529
BK (-)	7	10	14	16	6	10	14	11	2	15	7	7	119
EP	13	10	15	7	12	18	12	12	10	10	22	8	149
Total	**72**	**67**	**71**	**61**	**64**	**89**	**80**	**68**	**38**	**66**	**62**	**59**	**797**

New Report 1998

Number of out-patient per month in 1998 and from Jan. 1999 - Mar. 1999

Patinet come from	Jan.	Feb.	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total (1998)
Province	140	321	130	86	183	224	101	232	160	143	128	256	2,104
Phnom Penh	172	122	210	167	109	241	216	136	138	166	187	113	1,977
Total	**312**	**443**	**340**	**253**	**292**	**465**	**317**	**368**	**298**	**309**	**315**	**369**	**4,081**

Patinet come from	Jan.	Feb.	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total (1999)
Province	161	171	278	-	-	-	-	-	-	-	-	-	610
Phnom Penh	272	224	224	-	-	-	-	-	-	-	-	-	720
Total	**433**	**395**	**502**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1,330**

(2) Number of Examinations in Laboratory Unit per Year

Patients	Jan.	Feb.	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	12/16-1/15	1/16-2/15	2/16-3/15	3/16-4/15	4/16-5/15	5/16-6/15	6/16-7/15	7/16-8/15	8/16-9/15	9/16-10/15	10/16-11/15	11/16-12/31	
Smear Exa.	1313	1102	1136	1029	1002	1354	1371	1101	1108	1018	940	1,345	13,819
New case	1240	1015	1039	923	897	1237	1274	957	976	879	824	1,220	12,481
Control (Follow-up)	73	87	97	106	105	117	97	144	132	139	116	125	
Hematology	26	34	25	38	25	15	21	28	27	18	11	20	288
Leukocyte type number	26	34	25	38	25	15	21	28	27	18	11	20	
Fraction													
ESR	26	34	25	38	25	15	21	28	27	18	11	20	
Bleeding time	0	0	0	0	0	0	0	0	0	0	0	0	
Blood coagulation time	0	0	0	0	0	0	0	0	0	0	0	0	
Blood group	0	0	0	0	0	0	0	0	0	0	0	0	
Biochemistry	27	37	26	39	37	23	18	31	21	46	39	25	369
Urine	10	25	14	25	22	12	10	12	13	36	24	9	
Pleural fluid	15	12	11	14	14	10	8	17	8	9	14	13	
Ascitis fluid	2	0	1	0	1	1	0	2	0	1	1	2	
Cerebrospinal fluid	0	0	0	0	0	0	0	0	0	0	0	0	
Parasitology	16	10	11	8	9	8	11	11	13	12	9	16	134
Stool	16	10	11	8	9	8	11	11	13	12	9	16	
Total	1,382	1,183	1,198	1,114	1,073	1,400	1,421	1,171	1,169	1,094	999	1,405	14,609

(3) Number of Patients in X-ray Unit, 1998

Patients	Jan.	Feb.	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Test	426	430	411	442	471	634	463	760	441	474	431	570	5,953
Positive	243	260	230	257	243	402	288	319	224	238	287	263	3,254
%	57.04	60.47	55.96	58.14	51.59	63.41	62.2	41.97	50.79	50.21	66.59	46.14	54.66

(4) Number of Patients in X-ray Unit per Day

day	August, 1998		May, 1999		June, 1999	
1	Sat		Sat		Tue	
2	Sun		Sun		Wed	51
3	Mon	52	Mon		Thu	33
4	Tue	44	Tue	25	Fri	23
5	Wed	35	Wed	47	Sat	
6	Thu	37	Thu	52	Sun	
7	Fri	48	Fri	31	Mon	46
8	Sat		Sat		Tue	30
9	Sun		Sun		Wed	32
10	Mon	56	Mon	61	Thu	30
11	Tue	45	Tue	36	Fri	28
12	Wed	44	Wed	46	Sat	
13	Thu	38	Thu	14	Sun	
14	Fri	43	Fri	23	Mon	53
15	Sat		Sat		Tue	30
16	Sun		Sun		Wed	42
17	Mon	30	Mon	42	Thu	32
18	Tue	20	Tue	27	Fri	
19	Wed	21	Wed	29	Sat	
20	Thu	20	Thu	30	Sun	
21	Fri	13	Fri	21	Mon	52
22	Sat		Sat		Tue	44
23	Sun		Sun		Wed	22
24	Mon	35	Mon	44	Thu	32
25	Tue	49	Tue	40	Fri	26
26	Wed	24	Wed	31	Sat	
27	Thu	32	Thu	27	Sun	
28	Fri	26	Fri	24	Mon	41
29	Sat		Sat		Tue	23
30	Sun		Sun		Wed	39
31	Mon	34	Mon	52	Thu	
Total		746		702		709
days		21		20		20
Average		35.52		35.10		35.45

Time required

Chest(Adult)	5mn
Chest(Child)	6mn
Spine	6mn
Others	5mn

4hour morning session

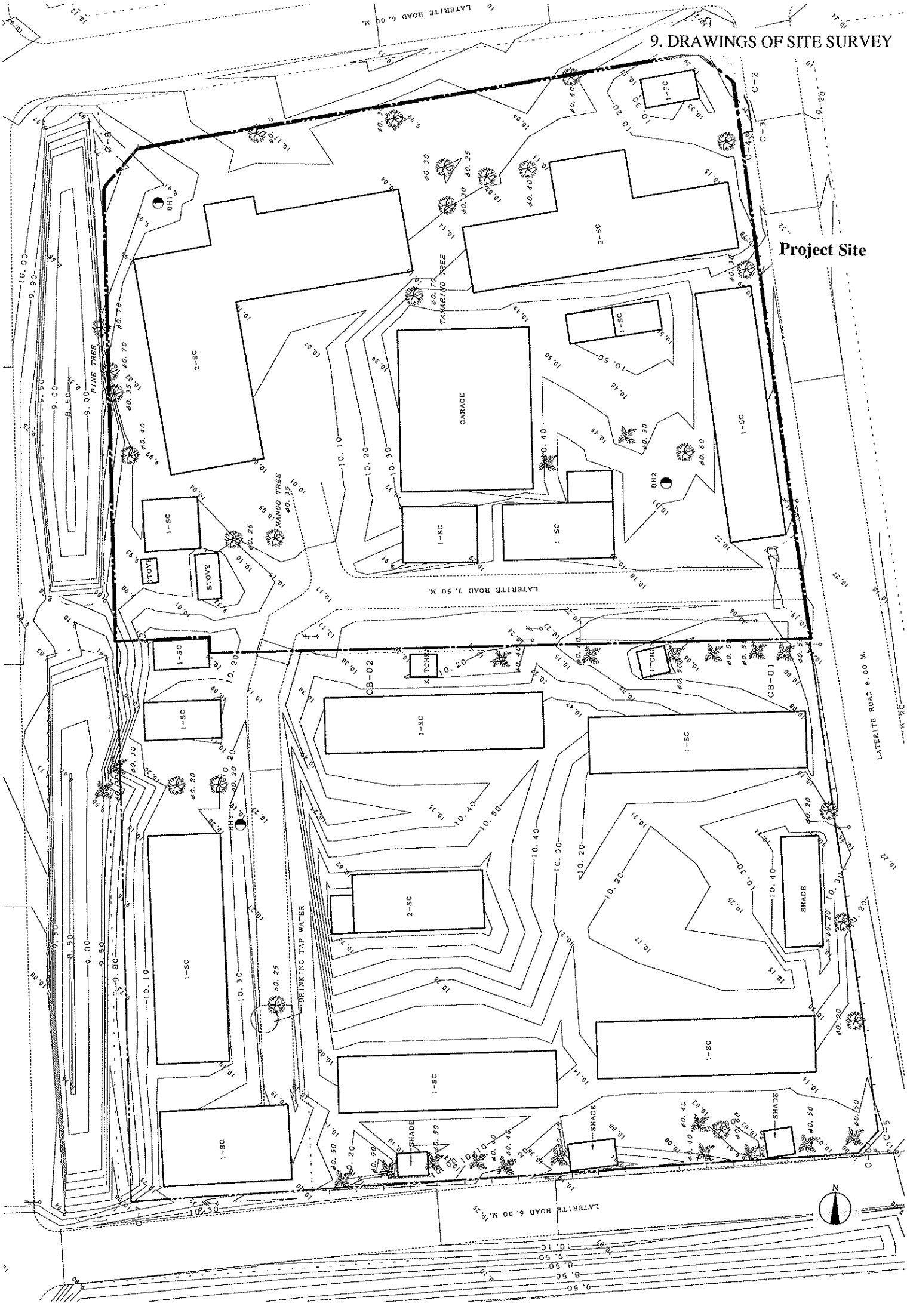
30 chest	2.5h
10 others	1h
40-50	3.5h

Percentage of Spine test

:Approximately 10 %

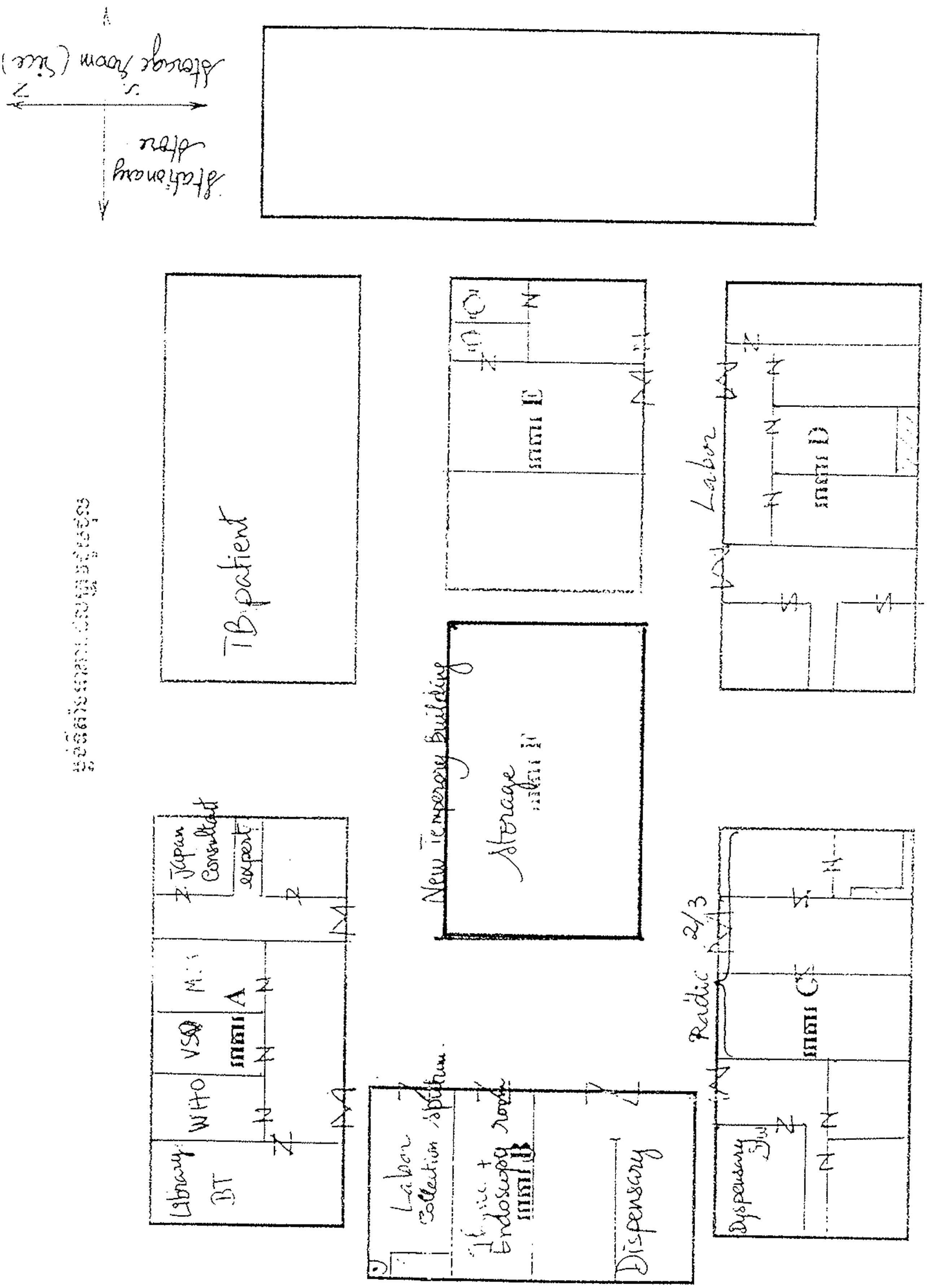
:more than 40

:more than 50


Project Site
LATERITE ROAD 6.00 M.
LATERITE ROAD 7.50 M.
LATERITE ROAD 5.00 M.
LATERITE ROAD 6.00 M.
GARAGE
SHADE
STOVE
TAMARIND TREE
MANGO TREE
PINE TREE
DRINKING TAP WATER
CB-01
CB-02
BH1
BH2
N

STAFF ALLOCATION

	Technical Bureau	Administration Bureau	Dispensary	Radiography	Laboratory	Pharmacy	Secretary	Accounting	Physiotherapy	Ward A	Ward B	Ward C	Ward D	Ward E
Doctor	17	6	7	1	2					2	2		3	2
Medical Assistant		3	5	1		2		1			1	2	3	4
Primary Nurse	1		3		1	1					1		1	1
Secondary Nurse		7	10	3	1	4		10		6	8	2	7	6
Primary Technician of Laboratory					1									
Secondary Technician of Laboratory					14									
Pharmacist					2	3								
Secondary Pharmacist						3		1						
Physiotherapist									4					
Administration Staff (Non-Technical Staff)		2												
Electrician		1												
Accountant								2						
Midwife								1						
Driver								5						
Simple Staff and Worker		3		1				4						
Total	18	22	25	6	21	13	0	24	4	8	12	4	14	13


TB patient
Labor
New Temporary Building
Storage
WHO
VSO
Library
Dispensary

1. Materials From CENAT

No.	Title	Date
CE -1	List of necessary rooms for the new facility (Proposal)	99/04/06
CE -2 -1	NTP Annual Report (Statistics) 1994	99/04/07
CE -2 -2	NTP Annual Report (Statistics) 1995	99/04/07
CE -2 -3	NTP Annual Report (Statistics) 1996	99/04/07
CE -2 -4	NTP Annual Report (Statistics) 1997	99/04/07
CE -2 -5	NTP Annual Report (Statistics) 1998	99/04/07
CE -3	Technical Guideline Ambulatory DOTS, NTP, November 1996	99/04/07
CE -4	Guide Technique Tuberculosis, NTP, June 1994	99/04/07
CE -5	NTP Work Plan 1993 - 1997	99/04/07
CE -6	NTP Development Plan (draft) 1997 - 2000	99/04/07
CE -7	Health Coverage Plan, MOH, June 1996	99/04/07
CE -8	Public Investment Program 1997 - 1999	99/04/07
CE -9	WHO Mission Report, 2 – 20 December 1996	99/04/07
CE -10	Cambodia Decease Control and Health Development Project (World Bank)	99/04/07
CE -11	HIV Prevalence Estimates for Cambodia : Recommendations for Future HIV Surveillance (Cambodia Trip Report, Sep. 30 – Oct. 12, 1996)	99/04/07
CE -12	Answers to Questionnaire	99/04/07,12
CE -13	Organization Chart of Ministry of Health	99/04/12
CE -14	Organization Chart of CENAT	99/04/12
CE -15 -1	List of Staff Allocation -1	99/04/12
CE -15 -2	List of Staff Allocation -2	99/04/16
CE -16	Quarterly Activity Report (from provincial hospital to CENAT)	99/04/13
CE -17	List of TB Center in 1999	99/04/16
CE -18 -1	Stock List of Laboratory in CENAT, Store A (2 Dec. 1998)	
CE -18 -2	Stock List of Laboratory in CENAT, Store B (28 Dec. 1998)	
CE -19	Statistics of Outpatient in Dispensary of CENAT	99/04/20
CE -20	Carte (Sample)	
CE -21	Tentative Schedule of TB Microscopy Training (Table)	99/04/16
CE -22 -1	Route of Supply until 3 quarter 1998 (Chart)	99/04/19
CE -22 -2	New Route of Supply (Chart)	99/04/19
CE -23	TB Drugs Logistics Cycle (Chart)	99/04/19
CE -24	Health Sector Reform in Cambodia (Chart)	99/04/19
CE -25	CENAT courses and meetings plan 1999/2000/2001/2002	99/04/28
CE -26	Budget 1998/1999	99/04/12
CE -27	Expenditure in CENAT 1998	99/04/12
CE -28	Budget for 1999/2000/2001/2002	99/04/28
CE -29	Annuaire Statistique de la Tuberculose au Cambodge TR-1995	99/04/07
CE -30	Tuberculosis Component of The Disease Control and Health Development Project – The World Bank / WHO Supervision Mission (Cambodia, 22 January – 2 February 1999)	99/04/07
CE -31	Acupuncture Data	99/04/12
CE -32	Name of facilities in Khmer	99/10/29

CE -33	Plan for temporary office buildings	99/07/22
CE -34	Schedule of Site Preparation	99/07/26
CE -35	Quarterly Workplan	99/07/26
CE -36	Symbol Mark	99/07/26
CE -37	Appointment Document	99/07/20
CE -38	Medical Data (Home Care DOTS)	99/07/22

2. Materials From MSF

No.	Title	Date
MS -1	COHORT ANALYSIS	99/04/06

3. Materials From Pasteur Institute

No.	Title	Date
PA -1	Bilan Clinique Et Paraclinique Des Patients Hospitalises Pour Sida	99/04/20
PA -2	Institut Pasteur du Cambodge, Prestations effectuees au 15 Janvier 1999	99/04/20
PA -3	Rapport Technique 1996	99/04/20
PA -4	Rapport Technique 1997	99/04/20

4. Materials From Municipality of Phnom Penh (Drainage and Sewerage Division)

No.	Title	Date
MU -1	Drainage Area Plan	99/04/07
MU -2	Drawings (Boeng Trabek Drainage System)	
	① Canal & Pumping Station Location Plan	99/04/26
	② Main Canal Plan	99/04/26
	③ Typical Canal Section for General Arrangement	99/04/26

5. Materials From MOH

No.	Title	Date
MH -1	Budget and Expenditure for CENAT	99/04/21
MH -2	Budget and Expenditure for MOH	99/04/27
MH -3	Bid Documents for the Construction of Health Centers	99/04/09
MH -4	Unit Cost Database	99/04/09
MH -5	Health Facilities Maintenance Guidelines (Draft December 1998)	99/04/09

6. Materials From Ministry of Water Resource and Meteorology

No.	Title	Date
ME -1	Meteorological Data Temp./Rain/Hum.	99/04/28

7. Materials From Calmette Hospital

No.	Title	Date
CA -1	Drawings of Hospital Calmette	99/04/12

8. Materials From Cambodian Red Cross

No.	Title	Date
CR -1	Hospital Engineering Project	99/04/28
CR -2	Medical Engineering Center	99/04/28

9. Materials From EDC

No.	Title	Date
ED -1	Electrical Supply Area Plan	99/04/23

10. Materials From Ministry of Posts and Telecommunications

No.	Title	Date
PT -1	Tariff for Telecom.	99/04/22

11. Materials From Phnom Penh Water Supply Authority (PPWSA)

No.	Title	Date
PP -1	Tariff for Water Supply	99/04/09
PP -2	Weekly Report (March 29 – April 4 1999)	99/04/09

12. Materials From Ministry of Environment

No.	Title	Date
EN -1	Regulation of Special waste	99/04/27
EN -2	Regulation of Water Pollution	99/04/27

13. Materials From Collecting by Local Company(PSBK)

No.	Title	Date
PS -1	List of Monthly fee of Rubbish Transport	99/04/26
PS -2	Additional Monthly List of Rubbish Transporting	99/04/26

14. Others

No.	Title	Date
CO -1	The Building Standards Act	99/04/28
CO -2	Labor Law	99/04/26