

ABBREVIATION

BFAD	Bureau of Food and Drug
BHS	Barangay Health Station
BPS	Biological Production Service
BRL	Bureau of Research and Laboratory
CDC	Center for Disease Control
CRL	Reference Laboratory, Cebu Chest Center
DAC	Development Assistance Committee
DOH	Department of Health
DOTS	Directly Observed Treatment, Short course
FHSIS	Field Health Service & Information System
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
INF/DOH	Health Infrastructure Service, Department of Health
NEDA	National Economic & Development Authority
NGO	Non-governmental Organization
NTP	National Tuberculosis Control Program
NTRL	National Tuberculosis Reference Laboratory
OPHS	Office of Public Health Service
PHO	Provincial Health Office
PTTC	Project Type Technical Cooperation
RHO	Regional Health Office
RHU	Rural Health Unit
RITM	Research Institute for Tropical Medicine
TBCS/DOH	Tuberculosis Control Service, Department of Health
WHO/WPRO	Western Pacific Regional Office, World Health Organization

C o n t e n t s

Preface

Letter of Transmittal

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Location Map of Project Site -2

Perspective / Model Photo

Abbreviation

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CHAPTER 1
BACKGROUND OF THE
PROJECT

CHAPTER 1 BACKGROUND OF THE PROJECT

1-1 Background of the Request

In response to the request for Grant Aid by the Department of Health (DOH), the Government of the Republic of the Philippines (GOP), the Government of Japan (GOJ) carried to carry out a Basic Design Study on the Project for the Establishment of National Tuberculosis Reference Laboratory (NTRL) in the Republic of the Philippines (the Project). The Study was carried out from the middle of September 1999 to the middle of May 2000.

The Study was conducted to confirm the necessity and urgency for the Grant Aid Project with the cooperation of the ongoing Project Type Technical Cooperation program named "TB Control Project". A Basic Design Study Team headed by Dr. Masashi Suchi, Chief, Project Development and Management Division, Department of International Cooperation, the Research Institute of Tuberculosis, Japan Anti-Tuberculosis Association, was dispatched from September 21 to October 20, 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 December 1 to 25, 1999 to explain and confirm the basic design to the Philippine 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 March 13 to April 6, 2000 to explain and confirm the result of the Basic Design Study to the Philippine side.

1-2 Outline of the Project

The Project consists of the construction of the new NTRL and the procurement of equipment. A complete description of the Project is given below.

- | | |
|--------------------------|---|
| 1) Overall Goal | : To improve Public Health Indices, especially tuberculosis incidence rate in the Philippines |
| 2) Project Goal | : To improve diagnosis capability on tuberculosis in the Philippines and to provide proper treatment to the patients. |
| 3) Output of the Project | : Improvement of the quality and quantity of TB control service provided through improving the skill of TB medical staff. |

4) Activities of the Project	:	
a) Contents of the Request	:	
- Facilities	:	Construction of National Tuberculosis Reference Laboratory which has 2 floors. (Training Laboratory Unit, Lecture Room, etc.)
- Equipment	:	- Provision of equipment for the reference laboratory function. - Provision of equipment for training of the personnel
b) Undertaking by the participants	:	- Implementation of training program at NTRL for TB practitioners, coordinators, medical technologists, etc. - Budget related to the Project and NTP - Secure manpower - Establishment of Administration and Management System
5) Project site	:	In the compound of Research Institute for Tropical Medicine (RITM), Alabang, Muntinlupa
6) Direct and Indirect Beneficiaries	:	Direct beneficiaries – All health personnel engaged in TB control program. Indirect beneficiaries - TB Patients (about 270,000 per year) in the Philippines

Components of the NTRL facilities were decided through discussions with DOH and JICA Experts of the ongoing TB Control Project.

CHAPTER 2
CONTENTS OF THE
PROJECT

CHAPTER 2 CONTENTS OF THE PROJECT

2-1 Objective of the Project

The objective of this Project is to strengthen the activities of the NTP for TB control through the establishment of the National Tuberculosis Reference Laboratory (NTRL). In order to achieve this objective, the NTRL shall strive towards the followings:

- 1) To maintain the quality of sputum smear examination in accordance with international standards;
- 2) To train microscopists for quality sputum smear examination, and supervisors and NTP coordinators in quality control of sputum smear examination; and -
- 3) To conduct operational research.

2-2 Basic Concept of the Project

2-2-1 Policy of the Cooperation

(1) Contents of the Project and Basic Concept

- 1) The Philippine side shall have completed the following undertakings by the commencement of the construction: demolition of the existing buildings (male dormitory and fence around it, basketball court and some portion of concrete footpath) within the site and land grading.
- 2) It was proposed that the TBCS office move to Alabang when the new facility is constructed in the RITM compound, which shall also host the CDC (Central Disease Control) Project. Therefore, it was decided that the TBCS office not be included in the planning of NTRL building.
- 3) It was confirmed that the NTRL could use the trainee dormitory and incinerator that belong to RITM. Training and lectures those are held in training laboratory and/or lecture room in RITM shall be held in NTRL. However, a site survey has determined the difficulty of sharing facilities (including electricity, water supply, telephone, etc.) with RITM.
- 4) It was agreed upon that almost all of the equipment proposed by the GOP should be installed following the confirmation of installation priority.

(2) Items to be noted for Basic Design

- 1) Site preparation (demolition of existing facilities, site clearance, land grading, etc.) and preparation of infrastructure (supply of water, electricity, telephone line, sewage, etc.)

The Philippine side shall be responsible for the counterpart budget, which shall cover the work involved for site preparation. A tentative counterpart budget plan was prepared by the Basic Design Team and was submitted to RITM, with the request that RITM take care of budgetary arrangements. Arrangement of the budget and schedule of preparation works of the Philippine side were reconfirmed at the Draft Final Report Explanation Study Stage.

- 2) Operation and maintenance of NTRL after construction
 - a) Budget for operation and maintenance: Including salaries, the operation and maintenance budget for NTRL has been estimated at about 20% of that of RITM's. It has been reconfirmed that DOH shall prepare the budget for NTRL. .
 - b) Staff allocation: NTRL shall employ a staff of 28, and the maintenance staff of RITM shall also serve NTRL.

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

The original request for this project from the Philippine side includes the followings:
a) Construction of the new NTRL building, and b) Provision of equipment to strengthen NTP.
The Study result and examination of the original request are as follows.

(1) Facility Plan

- 1) Confirmation of NTRL Specifications-

The requested components and floor area of the NTRL is shown in-Table 2-2-1.

- 2) Issues Identified
 - a) The Project site prepared by DOH is not enough for the proposed NTRL building, considering the necessary space for a existing well and a new road in the site in consideration with the future plan. Due to the limited space for the proposed building, the GOP has decided to demolish the existing male dormitory.
 - b) The plans for the third floor, Optional-1 and -2, were submitted from the JOP in the initial drawings attached to the proposal. There were, however, some aspects which require further studies since the space allocation, the rationale of the facility scale and site plan were not clear.
 - c) Some of the essential rooms, like Machine Room, Electrical Room, etc., were not included in the plan so that re-consideration of the components of the building was needed.

- d) Common space like as corridors, staircases, comfort rooms, etc., were not well planned.

Table 2-2-1 The original requested components of NTRL

Floor	Room	Q'ty	Area (m ²)
1st	Routine Laboratory	1	28
	Preparation Room	1	56
	Preparation Room	1	21
	Culture and Susceptibility Test Room	1	21
	Staff Room	1	28
	Meeting Room	1	28
	Data Analysis Room	1	21
	WC	2	28
	Storage/Electrical Room	1	21
	Others	-	118
		Total	
2nd	Lecture Room	1	84
	Storage	1	14
	Multipurpose Room	1	28
	Training Laboratory	1	63
	Preparation Room	1	21
	Library	1	21
	WC	2	21
	Others	-	88
	Total		340
3rd	<Optional-1>		
	Advisory Staff Room	1	63
	Meeting Room 1	1	42
	Meeting Room 2	1	42
	Material Room	1	42
	Storage	1	42
	WC	2	21
	Others	-	88
	Total		340
3rd	<Optional-2>		
	Advisory Staff Room	1	63
	TBCS Office	1	126
	Storage	1	42
	WC	2	21
Others	2	88	
	Total		340
	Grand Total		1,050

Source: Received Application Form for "The Project for the Establishment of National TB Reference Laboratory" dated April 26, 1999.

3) Study of the Contents of the Project

A detailed study of the required rooms, functions and number of staff was conducted, paying careful attention to avoid any over-estimation of size. As a result, the total floor area required for the NTRL building was estimated at 1,254 m² including common areas. The followings were considered in the estimation:

- a) A Management Staff Room for TBCS, BRL, RITM and others was added to the plan.
- b) The existing training center of RITM was found to be used fairly frequently and would not be able to accommodate additional programs. It was decided to include rooms for TB training.
- c) NTRL could use RITM's library, which is located in the existing dormitory. Therefore, a library was not included in the plan, although it had been requested.
- d) Number of staff was increased by the Philippine side from 8 to 28. Therefore floor area allocation for some rooms, like the staff room, was increased.

(2) Equipment Plan

1) Confirmation of Requested Equipment

The equipment requested by the GOP is aimed at:

- a) capability building of personnel involved in TB control and epidemiological surveillance;
- b) control and management of TB; and
- c) strengthening the functions of TB examination and diagnosis.

There were approximately 35 items in the list of requested equipment, most of which are appropriate to fulfill the purposes mentioned above.

The required equipment consists of laboratory examination/training equipment such as microscopes, operational equipment such as computers, including an incinerator and a generator for NTRL, tables and chairs for training/ examination rooms.

2) Investigation of Requested Equipment

It is considered appropriate to provide most of the requested equipment in order to strengthen the essential functions of TB examination, personnel training and TB control at the NTRL. But further study was needed from the viewpoint of additional equipment which might be effective for the activity of NTRL and the activity of Project Type Technical Cooperation.

A variety of equipment has been used for research, clinical and training purposes at the RITM where new NTRL is to be established. Therefore, the possibility was investigated and discussed in order for NTRL to share existing equipment and to utilize existing maintenance organization.

The discussion on the basic performance of the equipment was also needed since very little had been described on the equipment function in the initial equipment list.

2-3 Basic Design

2-3-1 Design Concept

The basic design of the facilities and equipment in the Project was based on the following design policies with due consideration of the result of the field survey, the environmental and social conditions of the Philippines, 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) Planning of new facilities and equipment was in accordance with the Basic Design Study, with consideration of the level and quality of the facilities and equipment required to fulfill NTRL's functions, such as Examination, Training, Quality Control, and Operations Research, and other future activities.
- (2) The new facilities and equipment were also coordinated with the Project Type Technical Cooperation by JICA.
- (3) Especially for the facility planning, the site layout was planned with consideration of functional layout and effective service flow in all of RITM, including training center dormitory and main building.
- (4) The meritorious aspects of design of relevant facilities in the Philippines and Japan were considered in the design. The existing problems of the buildings were then resolved in the plan.
- (5) The new facilities were also designed giving consideration to local weather conditions (rain, sun and wind) and local customs as well.
- (6) The design of facilities and utilities, and selection of equipment had been carried out with due consideration to reduce the maintenance and operation costs.
- (7) Application of local construction methods and materials and products from the near third country were considered for rationalization of construction and minimization of cost.

2-3-2 Study of Design Criteria

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

The determination of the contents and size of the facilities should be confirmed by the study of the number of rooms and the size of each room. The basic concepts for the determination of the contents and size of the facilities are as follows:

- 1) From an architectural point of view, the size of the major rooms is designed based upon studies of the layout plans of the required equipment. The number of rooms is minimized.

Furthermore, sizes of laboratories and training rooms are designed based upon the basic unit size since the TB reference laboratories require different standards and criteria for determination of room sizes. The aspects of safety and functionality are also considered for the space planning.

- 2) The zoning plan is designed to coordinate the functions of the personnel, services and goods within zones. Connections to other zones (including RITM building) and interior/exterior access must also be considered.
- 3) The places where people work (laboratories, training rooms, examination rooms etc.) are better designed and organized. The scale of the facility is determined based on the condition that such items as number smear examination, curriculum and number of trainees are ones as discussed during the site survey.
- 4) The new staffing schedule and organization of NTRL have been prepared by the Philippine side. A reasonable scale of the facilities is to be determined based on this schedule.

(2) Study for the Number of Rooms

As a result of the above mentioned discussions, the Basic Design Study Team has continued further study to determine the number of rooms and the size of each room for rationalization of facility planning. NTRL's schedule of training and seminar program was also discussed for the same objective.

1) Laboratory Division

a) Routine Laboratory

This Laboratory is to be used for sputum examinations of samples from RITM's out-patient clinic or other outside clinics. Another function of this Laboratory is to maintain the quality of smear examination by microscopy in accordance with international standards.

b) Culture & Susceptibility Test Laboratory

This Laboratory is to conduct culture and susceptibility test to determine anti-TB drug resistant strains which make treatment ineffective.

c) Sterilization Room

This room is to be used for washing and sterilization of glassware and other hardware equipment used in the Routine and Culture & Susceptibility Test Laboratories.

d) Media Preparation Room

This room is reserved for the preparation of the media and reagents used in the Culture & Susceptibility Test Laboratory.

2) Training Division

a) Training Laboratory

This Laboratory is to be used for training of Microscopists and Trainers in sputum examination. There is to be a connecting room for storage of teaching materials.

b) Lecture Room (with Multi-purpose Room, Stockroom 2)

This room is designed to accommodate 50 participants. A removable partition is to be provided so that the room can be divided into two. The Multipurpose Room is to be used for catering purpose or for reception area. The Stock Room is to be provided space for unused tables, chairs and other equipment.

3) Administration Division

a) Data Analysis Room

This room is the place where the formulation of the data base for the drug resistance survey and the TB Control Program will take place.

b) Laboratory Staff Room

This room is to be used for study or deskwork by the laboratory staff. Space for printing and copy machine is provided in this room.

c) Others

In addition to the above rooms, the Administration Division will require the following rooms: Advisory Staff Room, Management Staff Room, Conference Room and Meeting Room.

(3) Computation of Size for Each Room

In accordance with the scale of the Project mentioned in paragraph (2), the floor area is estimated based on the expected number of rooms in the new facility. The facility size is formulated based on other similar facilities (projects) undertaken by Japan's Grant Aid assistance and the Standards of Architectural Institute of Japan.

1) Laboratory

a) Routine Laboratory (42m²)

The floor area of this room will be calculated based on function, number of staff, and layout of equipment.

The number of personnel (Medical Technologists) is estimated at around 4 or 5.

The floor area per person for Routine Laboratory is larger than the floor area of an ordinary laboratory. In case of the TB Reference Laboratory in Cebu, the floor area of the Routine Laboratory is calculated at about 23m² for 2 or 3 persons. Considering the foregoing factors, and the layout of equipment, the floor area of laboratory is calculated at 6m x 7m, or a total of 42m².

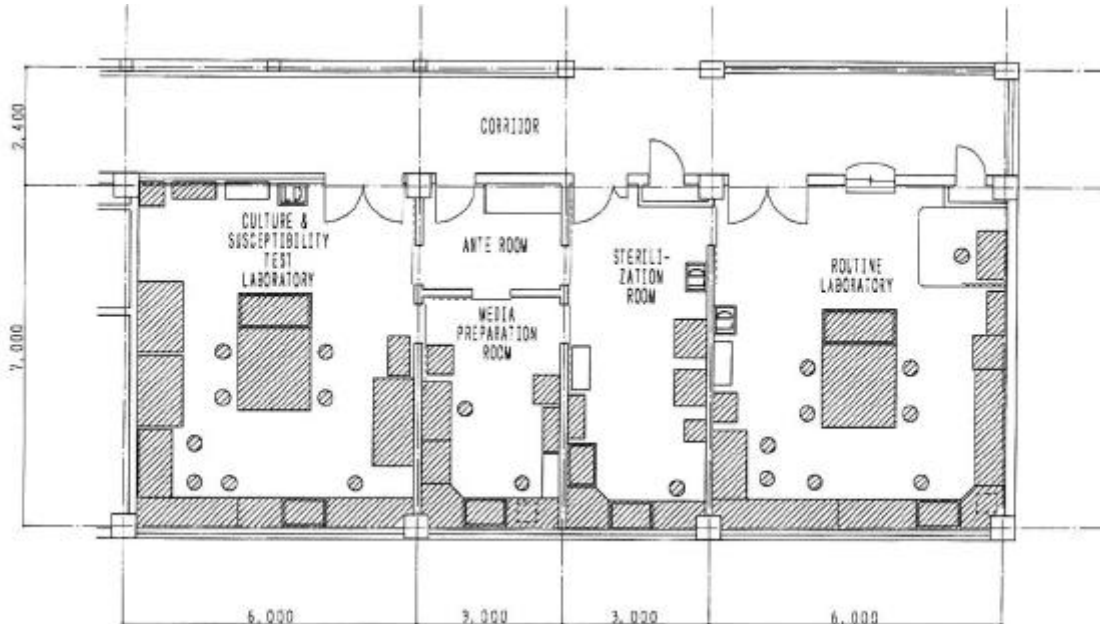


Figure 2-3-1 Routine Laboratory, Culture & Susceptibility Test Laboratory, and Media Preparation Room

b) Culture & Susceptibility Test Laboratory (42m²)

The number of staff in this Laboratory will be 4 to 5. Therefore, the necessary floor area of this laboratory is calculated as the same as the Routine Laboratory (6m x 7m = 42m²).

c) Sterilization Room (21m²)

Although the floor area requested was 56m², according to the layout of equipment, the floor area of this room should be 3m x 7m, or 21m².

d) Media Preparation Room (21m²)

The requested floor area was 21m². According to the layout of equipment and including the ante room (6m²), the floor area of this room is calculated at 21m².

2) Training Division

a) Training Laboratory (63m²)

The Training Laboratory is designed to accommodate 12 to 15 trainees. Two laboratory tables with a sink for 12 persons, side laboratory tables, white board and 3 safety cabinets on the side of the Room for Teaching Materials are to be installed in accordance with the training program. The floor area of this room is 9m x 7m for a total of 63m² (5.2m² per trainee). The floor area of the Room for Teaching Materials is calculated at 21m², based on the layout plan of equipment and required staff (1 – 2 persons).

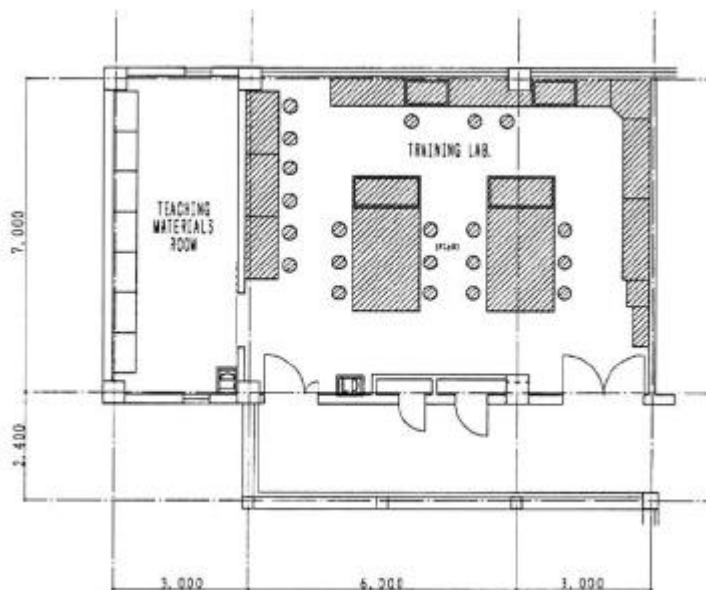


Figure 2-3-2 Training Laboratory

b) Lecture Room (with Multi Purpose Room, Stockroom) (84m²)

This room can be partitioned into two rooms according to seating capacity: large (84m²) and medium (42m²). In the case of providing attendees with tables, the large lecture room is to have a capacity for 50 – 60 people, and the middle lecture room, a capacity for 25 – 30 people.

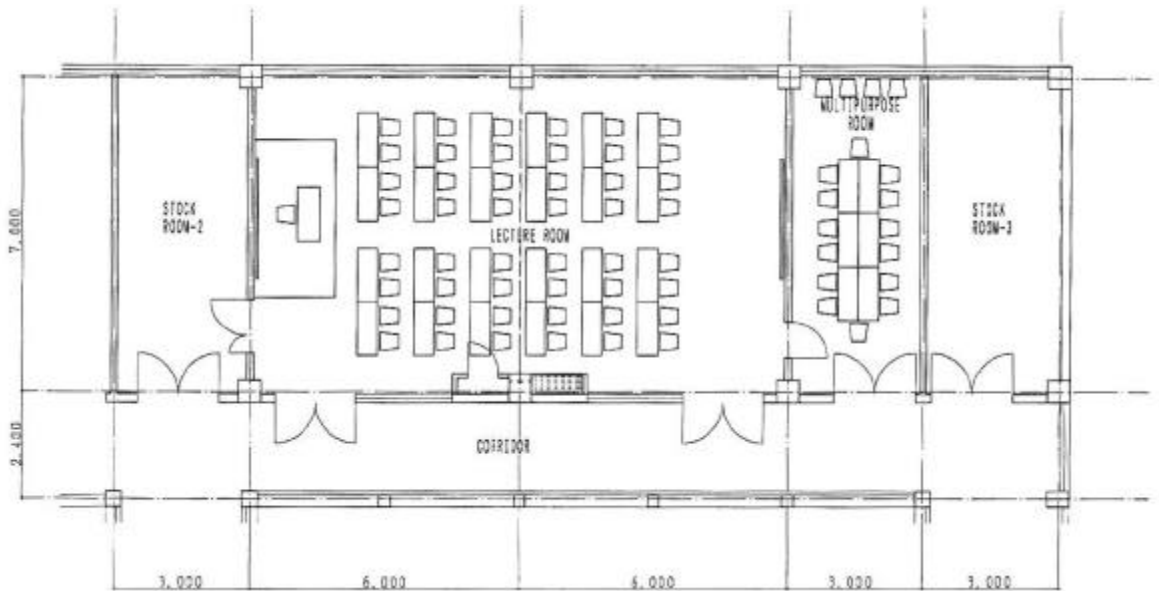


Figure 2-3-3 Lecture Room

3) Administration Division

a) Data Analysis Room (21m²)

Two staff members (Statisticians) will be accommodated in this room. In case of surveillance work, this room requires space for a large table for data gathering and data processing. The floor area of this room is calculated at 21m², based on studies of the above requirements.

b) Laboratory Staff Room (63m²)

The number of staff (Medical Technologists) in this room will be 6 to 11. Based on the Japanese Standard (6m² per person), this room is the minimum space for 6 to 10 persons, including a printing corner.

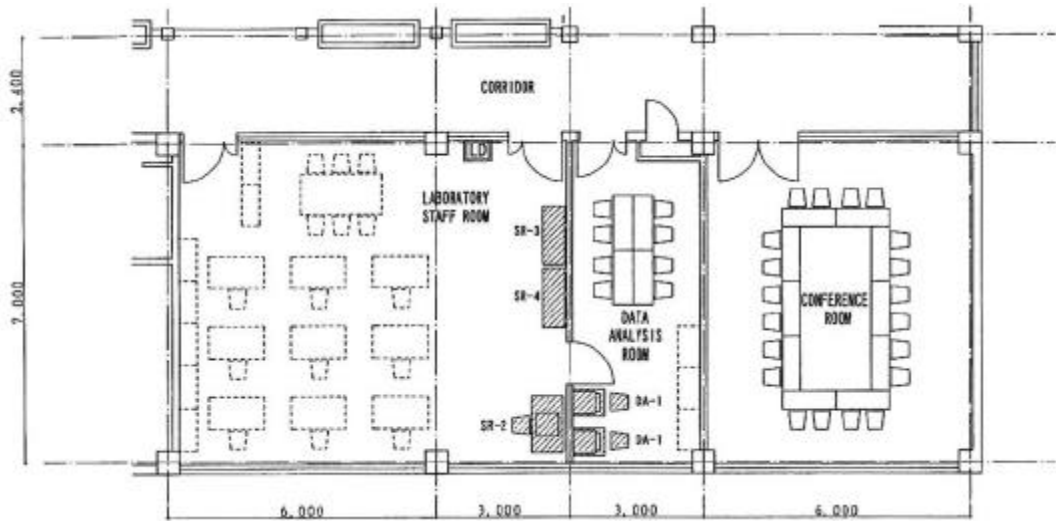


Figure 2-3-4 Data Analysis Room and Laboratory Staff Room

c) Advisors Room (63m²)

There will be 5 to 6 people who will be using this room. This room, including a small meeting space, is 63m².

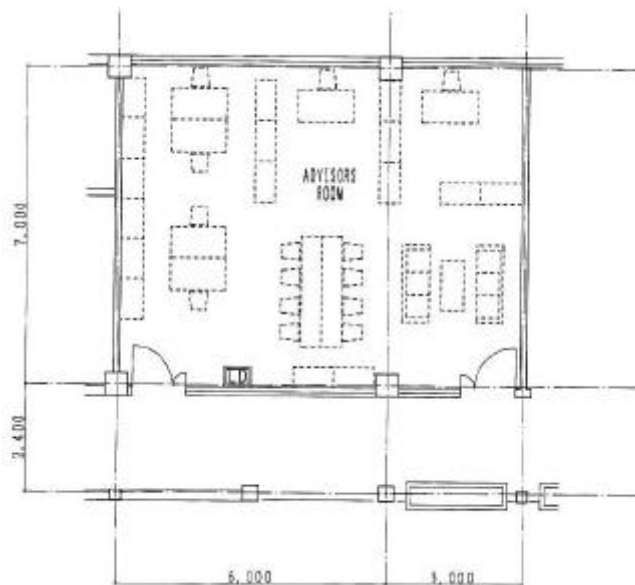


Figure 2-3-5 Advisors Room

d) Management Staff Room

More than 10 people(including past-time staff) from RITM, TBCS, BRL, etc. will be staying in this room. Floor area of this room is calculated at $9\text{m} \times 7\text{m} = 63\text{m}^2$.



Figure 2-3-6 Management Staff Room

(4) Facilities Required and Area of Each Facility

Based on the foregoing discussion, a summary of the required rooms and their corresponding floor area is provided in Table 2-3-1.

Table 2-3-1 Summary of the Required Rooms in NTRL

Floor	Division	Facilities	Area (m ²)
1F	Administration	Data Analysis Room	21.00
		Laboratory Staff Room	63.00
		Advisors Room	63.00
		Management Staff Room	63.00
		Conference Room	42.00
		Meeting Room	21.00
	Machine	Generator Room	21.00
		Machine Room	25.35
		Electrical Room	16.65
		Blower Room	6.00
	Others	Entrance Hall	63.00
		Stockroom 1	21.00
		Comfort Room (M)	16.00
		Comfort Room (F)	14.00
		Comfort Room (D)	4.05
		Kitchenette	2.65
		Corridor	142.10
		Stairs	15.00
Total			619.80
2F	Training	Lecture Room	84.00
		Multi Purpose Room	21.00
		Training Lab.	63.00
		Room for Teaching Materials	21.00
	Examination	Routine Laboratory	42.00
		Culture & Susceptibility Test Laboratory	42.00
		Sterilization Room	21.00
		Media Preparation Room	21.00
	Others	Stockroom 2	21.00
		Stockroom 3	21.00
		Stockroom 4	4.05
		Comfort Room (M)	16.00
		Comfort Room (F)	14.00
		Kitchenette	2.65
Corridor		189.40	
Stairs (incl. RF)	42.00		
Total			625.10
Grand Total			1,244.9
Annex	Neutralization Room	9.10	
GRAND TOTAL			1,254.00

(5) Equipment Design

The following points were taken into consideration about equipment during discussions with representatives of GOP:

- 1) Studies are to be made to determine the possibility of sharing the existing equipment at RITM.
- 2) The number of laboratory tables and chairs required for the laboratories and training rooms are to be decided based on information, such as number of trainees, area of each room, and the layout of tables and equipment.
- 3) Equipment to be locally procured, such as photocopiers, personal computers, television and videotape recorders, are to be carefully considered in terms of repair and maintenance. Warranty and maintenance contracts for these items are to be investigated.
- 4) In order to avoid duplication of procurement by this Project and Project Type Technical Cooperation, coordination is to be made with the concerned JICA experts.

2-3-3 Basic Design

(1) Site Layout Plan

The layout plan has been prepared on the basis of the existing conditions (the natural environment, present condition of the site and its surroundings), with consideration of the results of site analysis and analysis of RITM's existing and future facility structure as well as the points listed below.

- 1) An easy and safe approach has been considered.
- 2) Service flow and staff working condition was also taken into account.
- 3) The plan was designed to prevent the mix of vehicular and pedestrian flow in the NTRL Zone. For example, visitors arriving by car should use the parking lot in front of the main building of RITM and approach the NTRL main entrance on foot through the main building or approach road of north side.
- 4) Several alternative plans 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. Inner court will retain a quiet and comfortable atmosphere and natural lighting and ventilation will be provided to the facilities.
- 5) Building orientation was considered in order to secure good ventilation and good sunlight conditions throughout the year.
- 6) As the Project site is next to a residential area to its south, the environment and landscape were considered. Therefore, buildings with only two stories and without any tall walls shall face the residential area side.

(2) Architectural Design

1) Floor plan

The floor plan of the facility has been studied taking into consideration 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 3 divisions (Examination, Training and Administration) will have a rationalized zoning and layout design considering function and mutual circulation. The first floor is for the Administration zone and Machine Room. Training and Examination zone on the second floor includes the Laboratory and Lecture Room.

- b) Standardized module planning is essential for the flexibility of design, reduction of cost, and rationalization of construction.

By considering the above, and the most economical span for modules, a 6m x 7m module will be adopted for the floor plan.

- c) Local materials will be selected wherever possible.

In consideration of the maintenance and operation costs for the facilities after construction and the physical conditions in the Philippines, maintenance of the selected materials should be as easy as possible so as to reduce the operation and maintenance costs to the extent possible.

Based on these conditions, the facilities in each zone are as follows:

Table 2-3-2 Facilities in Each Zone

Zone	Facilities	Floor
a) Administration	Data Analysis Room, Laboratory Staff Room, Advisors Room, Management Staff Room and Conference Room	1F
b) Examination	Routine Lab., Culture & Susceptibility Test Lab., Sterilization Room, Media Preparation Room	2F
c) Training	Training Lab., Lecture Room	2F

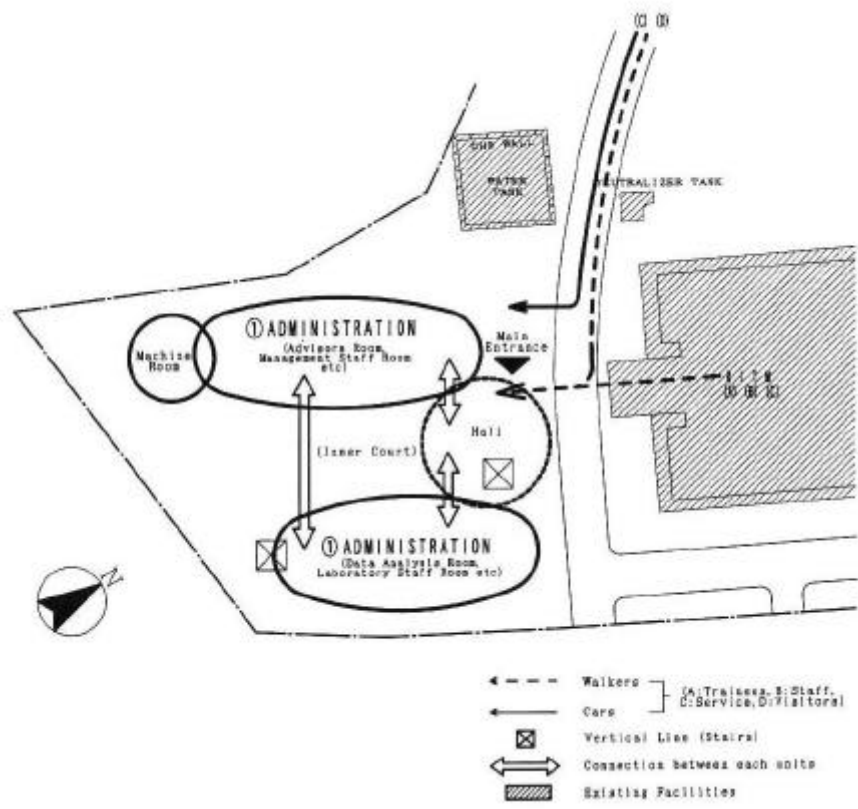


Figure 2-3-7 Zoning and Traffic Line Plan - 1F

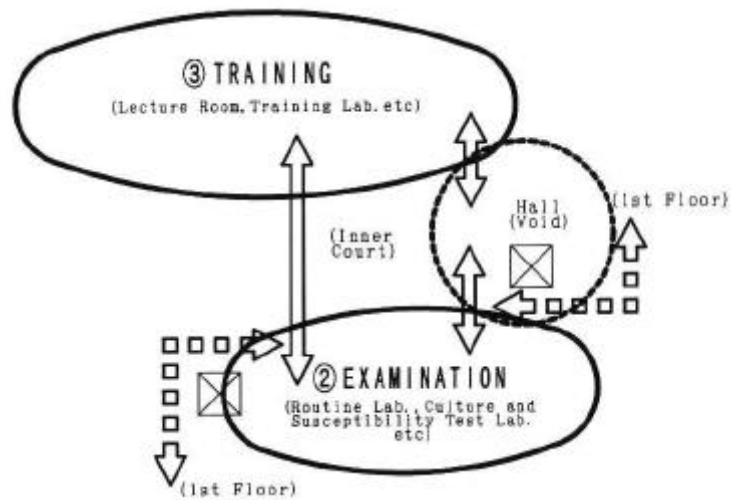


Figure 2-3-8 Zoning and Traffic Line Plan - 2F

2) Elevation and Cross-Section Plan

- a) The roof will be sloped for quick discharge of rain water.
- b) The eaves will protrude to protect rooms from direct tropical sunlight and rainfall.
- c) Ventilation block, which allows sunlight and wind to pass through is considered to be used in the façade in order to provide protection from sunlight and rain water.
- d) Wall surfaces will have openings as large as possible in order to enhance room ventilation and provide a balanced intake of sunlight as well as reduction of equipment running costs.

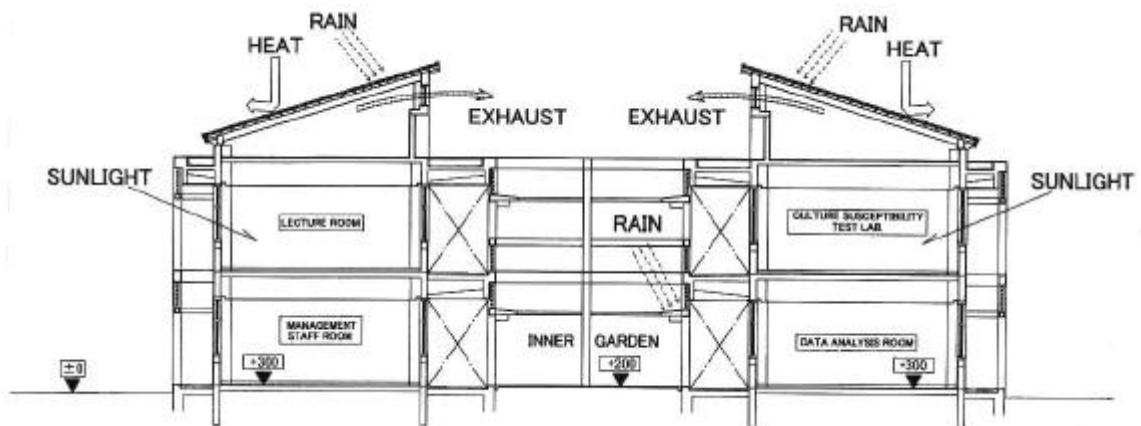


Figure 2-3-9 Cross-Section Plan

3) Cost Reduction Measures

The various factors of cost reduction which have to be considered in the course of design works for NTRL building are enumerated below. The cost performance and the maintenance cost must be taken into account in planning.

- a) For the cost reduction, it is advisable that the planning should be done systematically with a proper structural module. The planning of the facilities should be done by modular coordination considering scale of rooms, adequate plan dimension and economical span of the structure.
- b) The overall size of the facility is determined so as to enhance the utilization rate of rooms and to promote the effective use of rooms, utilities and equipment.
- c) Local construction materials should be used so as to reduce the costs for construction and maintenance. Also, in the long-term view of the Project, together with the consideration of the maintenance costs of the facilities, the finishing materials will be selected based on their life and maintenance characteristics.
- d) Consideration is to be given to the introduction of high energy-saving equipment, efficient equipment and insulation materials in order to reduce operational expenses.
- e) In principle, natural lighting is to be applied as much as possible and artificial lighting is to be minimized in order to reduce maintenance costs.
- f) 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 consider functional durability and economics of the building.
- b) Traditional design style of the Philippines may not be adopted without careful consideration. Considering the climate, culture and traditional architectural style as much as possible, the basic design concept shall be formulated from the viewpoint mainly of the local material and construction methodology.
- c) Since the form of the roof and façade are important elements of the architectural design, these shall carefully be developed in the process of further detailed design. Consideration should be given to the fact that the building design should not be overly elaborate.

(3) Structural Design

1) Basic Policy

The structural design for the Project should be formulated after a full review of the existing site conditions. The structure shall not be excessive, e.g. deflection, settlement, etc.. In addition, the building shall have sufficient durability to resist earthquakes, strong winds, etc.

2) Standard for Structural Design

Generally, the National Structural Code of the Philippines (NSCP) is commonly used for structural design in the Philippines. Other relevant standards of the Architectural Institute of Japan are to be referred to for safety and rationality as well as reduction of construction cost. The standard for materials and tests is to be in accordance with ASTM.

3) Methods and Materials

The superstructure is to be of concrete frame with earthquake-proof wall, and partitions made of concrete block. A steel (frame) structure is to be provided for the roof of the building. Concrete, concrete block, re-bar and structural steel are locally available.

Concrete: Design strength (f_c) = 21 N/mm²
(28 days compressive strength of cylinder test piece)

Although wood truss construction could be used for the roof, steel frame construction will be adopted to achieve durability and avoid problems with termites.

4) Foundations

In order to ensure the structural safety of buildings, a soil survey was carried out during the Basic Design Survey.

The results of the soil investigation indicated that the layers from ground level to a depth of 2.55 m are soft and weak clay mixed with sand.

The layers below 2.55m are sandstone, and can be used to support the foundations of the buildings.

In order to design a two-story building, the use of independent foundations is recommended.

5) Design Load

a) Dead Load

Dead load consists of the respective weights of structural members and finished materials. It is dependent upon the thickness of floor, walls, ceiling, etc.

b) Live Load

Live load shall be calculated depend on the anticipated use of the building, including the weight of equipment and installations.

c) Earthquake Load (seismic force)

In the Philippines, earthquake occurrence is frequent, although not as frequent as in Japan. According to NSCP, in the Philippines, earthquake load could be reduced to 75% of the appropriate value in the Building Standard Law of Japan.

d) Wind Load

According to the NSCP, the Project site is in Zone II. Wind pressure is approximately 200kg/m^2 below a height of 15m. The influence of the wind pressure shall be considered in the structural design.

(4) Utility and Building Facility Plan

1) Electrical Works

a) Power Supply Facilities

In the existing RITM compound, two low voltage power supplies (3 ϕ 3w 220 V 60Hz) are transmitted to the existing main building and dormitory through aerial wiring from transformers installed on electrical poles by Manila Electric Company (MERALCO), as indicated below.

The existing main building	Capacity of Transformer	250 KVA \times 3
	Power Demand	328KW
The existing dormitory	Capacity of Transformer	167 KVA \times 3
	Power Demand	177KW

Both of the existing electrical facilities are fully loaded at this time and the existing transformers have no additional capacity. Therefore new power supplied by MERALCO is necessary for this Project. Through the discussions with MERALCO, it was confirmed that MERALCO could supply power for this new facility and all related work for this new power supply should be executed by the Philippine side according to Japan's Grant Aid Scheme.

The estimated power load is calculated as follows:

Description	Load Density VA/m ²	Floor Area m ²	Total Load KVA	Remarks
Lighting, Small Appliances	40	1,200	48	
Air conditioning Equipment	200	600	120	
Laboratory Equipment	-	-	45	
Plumbing Equipment	-	-	20	
Total			233	

Thus, the estimated power load is approximately 233 KVA.

Recently, there have been very few power failures in Metro Manila, since the power supply from MERALCO has been greatly improved, according to discussions with engineers in RITM, the Infrastructure Service of DOH and MERALCO. When the power voltage at some socket outlets in the RITM were measured, the results certified that power supply was stable and the range of voltage fluctuation was allowable. Therefore no automatic voltage regulators for the power distribution lines are considered necessary. However, some laboratory

equipment and personal computers which are more sensitive to voltage fluctuation should each be provided with UPS or AVR.

b) Stand-by Generator

A stand-by generator should be provided, in order to maintain power supply for pumps and some laboratory equipment that are required for continuous operation.

- i) Type Indoor packaged diesel engine driven generator low noise type, Radiator Cooling Type
- ii) Capacity 3 Phase, 3 Wire, 220V, 60Hz, Output 85KVA, Quantity 1 number
- iii) Operational hours 10 hours
- iv) Fuel Diesel Oil, Fuel Tank Capacity, 150 liters
- v) Emergency Load Laboratory equipment, Hydrant pump, Sewage treatment plant, Neutralization plant, some other pumps

c) Main Feeder Wiring System

- i) Cable and Wiring Material XLPE cable ,Fire Resistant cable, PVC cable
- ii) Wiring Method Cable Ladder, Conduit Pipe
- iii) Power Distribution For Lighting and Small Appliances 1 ϕ 2W 220V
For Power 3 ϕ 3W 220V

d) Lighting Fixtures

- i) Illumination Level

Laboratory, Preparation Rm.	400 Lux
Lecture Rm. Meeting Rm.	300 Lux
Data Analysis Rm.	400 Lux
Office	300 Lux
Toilet, Corridor	100 Lux
Storage	50 Lux

ii) Emergency Light, Exit Light

Emergency Light and Exit Light with batteries should be installed in accordance with the Philippine regulations.

e) Telephone System

The existing telephone system for RITM was completely renovated in November 1996. However, the existing private automatic branch exchange (PABX) has no additional capacity for NTRL. In order to make the telephone facility cover both

RITM and NTRL, a new PABX should be provided which has a networking function with the existing facility.

The specification of the telephone system for NTRL is as follows:

Lead-in lines from PLDT (Philippine Long Distance Telephone Co.)

Direct line:	2 lines
Trunk line:	2 lines

Private automatic branch exchange (PABX) with UPS

2 trunk lines
4 tie lines
16 digital local lines

Digital telephone sets	Quantity: 16 numbers
------------------------	----------------------

f) LAN (Local Area Network) System

The existing RITM was equipped with a LAN (Local Area Network) system a year ago. The LAN system consists of three server computers, about 60 terminal computers, networking component and horizontal subsystem. The specification is as follows:

Adopted LAN Standard :	100BASE-T
LAN Transfer Speed:	100 Mbps
Switch (24 port):	3 digits numbers

In order to facilitate networking communication in all facilities in RITM and NTRL, expansion of the LAN system for NTRM is indispensable. The existing LAN system can be extended to a new horizontal subsystem in NTRM by connecting the existing switch to a new one. Fiber optical cable should be used for the main line between the switches to assure reliable signal transmission.

g) Public Address System

In the existing RITM, a public address system is provided for communication. However, the amplifier of the existing public address system has no additional capacity for NTRL. In order to make the communication facility cover both RITM and NTRL, NTRL should be provided with a new amplifier which is to be connected to the existing one.

h) Emergency Calling System

Emergency Calling System should be provided in the toilet for the disabled. When someone encounters difficulty, he or she can call for help by pushing a button, which alerts someone outside the toilet or in the staff office of the emergency.

i) Master Antenna Television System

Master antennas for UHF and VHF wave band should be installed on the roof and TV outlets are to be provided in offices and lecture rooms.

j) Fire Alarm System

Fire alarm system should be provided in accordance with the Fire Code of the Philippines. The fire alarm control panel is to be installed in the management staff room. To alert someone in the main building of a fire outbreak in NTRL, the fire signal should be transmitted to the existing fire indicator installed next to the existing fire alarm control panel in the main building.

k) Lightning Protection System

Lightning protection system should be provided to prevent serious damage to the building structure and electrical facilities.

3) Air conditioning and Ventilation Work

a) Air conditioning System

Laboratories, preparation room, lecture room and offices should be provided with Split type air-conditioners to maintain appropriate indoor condition against hot and humid ambient conditions.

The air conditioning standard of PSME CODE (Philippine Society of Mechanical Engineers) and ASHRAE (American Society of Heating, Refrigerating and Air-conditioning Engineers) will be adopted as design criteria for the air conditioning and ventilation system.

Outdoor:	Dry Bulb - 34°C, Wet Bulb - 29°C, Daily Range 12 degree (ASHRAE Fundamentals 1997: at Manila)
Indoor:	Dry Bulb 25~26°C

b) Ventilation System

Laboratories and preparation rooms should be prepared with mechanical ventilation system to maintain negative pressure inside. Mechanical ventilation system should also be provided to deliver fresh air to each air-conditioned room such as offices and lecture rooms.

Standards for Ventilation

Room	Method of Ventilation			Unit Air Flow Rate
	Type 1	Type 2	Type 3	
Office, Conference Rm.				25 m ³ / (Occupant• Hour)
Lecture Room				25 m ³ / (Occupant• Hour)
Laboratory, Prep. Rm.				5 Round /Hour, Negative Press.
Mechanical Room				10 Round /Hour
Electrical Rm.				10 Round /Hour
Toilet				10 Round /Hour
Storage				5 Round /Hour

Note) Type 1 Provide fresh air supply fan and exhaust fan
 Type 2 Provide fresh air supply fan
 Type 3 Provide exhaust fan

4) Plumbing Work

a) Water Supply System

i) Source of water supply

Deep well water is to be supplied from RITM.

ii) Water Supply System

Water supply system will be divided into two pipe systems, potable water and flushing water. Sterilized well water will be supplied to water closets and urinals as flushing water. A water softener and sand filter should be provided to treat well water. This treated water will be supplied to taps and laboratory equipment as potable water. Both potable and flushing water should be delivered from each elevated tank by force of gravity.

iii) Water Consumption

Occupants	- Staff : 35 persons	
	- Trainee: 15 persons	Total 50 persons

Water Consumption:	50 persons X 120 ltr/day / person	= 6,000 l/day
	<u>Equipment</u>	<u>1,000 l/day</u>
	Total	7,000 l/day
		7 m ³ /day

b) Sewerage System

As no city sewer line is provided around the RITM compound, wastewater should be treated by a sewage treatment plant and discharged to the river through the existing drainage pipeline. Therefore, a new sewage treatment plant should be provided in accordance with Department of Environment and Natural Resources (DENR) standard.

As for chemical wastewater, after conducting biological examination using acid, alkaline and organic solvent in the laboratories, this wastewater should be stored and sterilized properly at each laboratory. However, a neutralization plant is planned to be provided to make adjustment of pH level of wastewater from laboratories and preparation rooms.

According to the regulations of DENR, the standard for water quality of effluent water from sewage treatment plants should have a BOD of less than 50 ppm.

Sewage Treatment Plant:	Capacity	7 m ³ /day
	Effluent water quality	BOD under 20ppm
Neutralization Plant:	Capacity	1m ³ /day

c) LPG (Liquid Petroleum Gas) Supply System

LPG should be supplied from a manifold of LPG cylinders to experiment tables and safety cabinets in laboratories. The manifold of LPG cylinders is to be located outdoors to avoid explosion by gas leakage.

d) Fire Fighting Facility

Fire hydrant system and fire extinguishers should be provided in accordance with the Fire Code of the Philippines.

5) Garbage and Chemical Waste Disposal

In the existing RITM, the combustible garbage and refuse from all facilities are to be classified and stored properly and burned by an efficient incinerator. Infectious waste is autoclaved or sterilized at each laboratory and brought directly to the incinerator. The incinerator that was installed in January 1999 has a capacity of 300 kg/day. It was confirmed during the discussion with the Philippine side that it has enough capacity to deal with additional waste from NTRL.

In 1999, the Clean Air Act took effect and the use of incinerator was prohibited as a rule. However, RITM will make the existing incinerator conform to standards when detailed requirements are already fixed.

(5) Equipment Plan

1) Basic Specifications

A summary of basic specifications of equipment is provided below.

Table 2-3-3 Basic Specifications of NTRL Equipment

Location	Item	Results
Culture and susceptibility test Lab	Centrifuge	In order to minimize the heat generated by the rotor revolution, a refrigerated centrifuge is planned.
Culture and susceptibility test Lab	Deep Freezer	In order to preserve tubercle bacilli for a long period of time, approx. -80-degree level equipment is planned.
Routine, Culture Media, Preparation, and other Labs	Glassware etc.	Test tubes, pipettes, flask, cylinders of various sizes and other devices are planned considering the glassware used at the TB Reference Lab in Cebu.
Culture Lab	Incubator	To perform the drug resistance surveillance, total inner capacity of the incubator is decided at more than 1000 liters.
Culture, Routine, Labs and Training Room	Loop-Cinerator	This device is needed to decontaminate the loop which is used to smear sputum on a slide glass in a safety cabinet. Two loop-cinerators each are to be allocated for a safety cabinet.
Lecture Room	Computer Projector	LCD projector equipped with a CCD camera is proposed. A personal computer is to be furnished by the Philippine side.
Training Room	Teaching Microscope	Considering the frequency of usage and ease of operation, a teaching microscope for every three persons (including trainer) is planned.
Training Room	TV/Video System	Monitor size of approx. 25 inches is planned, considering ease of handling.

Followings are the results of discussion on major equipment that took place during the basic design study and analysis in Japan.

a) Incubator

The incubator is used to culture various kinds of Mycobacteria to perform drug susceptibility tests as part of the drug resistance surveillance. It is required in this case that sputum of each patient is cultured in four test tubes as primary culture and in two test tubes as secondary culture. In addition to this, ten more sputa are to be cultured for drug sensitivity test. Thus, 16 sputa in test tubes in total from a patient are kept in the incubator for 4 to 8 weeks. Since this surveillance is targeted to cover a large number of samples, the number of test tubes to be kept in the incubator is quite large.

In order to perform those examinations, 2 units of incubator of more than 500-liter capacity each, totaling more than 1000 liters, are to be procured.

b) Laboratory tables and Microscopes

The numbers of laboratory tables, chairs, microscopes and so on have been determined based on 12 trainees at a time on average and a maximum 15 trainees.

One set (priority A) of 5-head and one set (priority B) of 2- or 3-head teaching microscopes were requested from GOP. During analysis in Japan, however, it was commented by one of the TB training specialists that 5-head microscopes are not easy to use for training for TB, because of the high magnification of the microscope (1000x is used). Therefore, two sets (priority A) of 3-head teaching microscopes are planned.

c) Safety cabinets

In compliance with the NFS Standards (USA) and recommendation of World Health Organization (WHO) and International Union Against Tuberculosis and Lung Disease (IUATLD) the class II safety cabinets with HEPA filters are to be introduced in the Culture & Susceptibility Test Laboratory, Routine Laboratory and Training Laboratory.

d) Computer systems

One computer system for the Laboratory Staff Room and two computer systems for the Data Analysis Room are planned for production of report, statistical analysis of TB control data, management of surveillance and quality assurance.

Since a LAN system covers the whole main building of RITM using high performance computers, the computers to be installed in NTRL will be equipped with the capability for connection to the existing LAN system.

Regarding software, statisticians are working through using epidemiological software downloaded from the website of a US-based firm. Since the English language is commonly used in the Philippines, an Operating System, like Windows 98 or higher version and application software, like Office 98 or higher, are most appropriate.

e) Vehicle

In order to monitor the performance of sputum examination and Q/A activities' after trainings at the provincial and even peripheral microscopic centers, a vehicle is indispensable. Several vehicles were procured by RITM and TBCS through

Grant Aid of GOJ and other donors in the 1980s and 90s, but most of them have become obsolete and unsuitable for long distance journeys.

Preliminary plan presented from GOP for surveillance and monitoring of TB control activities is as follows:

- Long distance
 - i) Purpose of visit: monitoring of sputum examination and Q/A activities
 - ii) Travel distance: 250 to 300 km per trip (one way, the longest)
 - iii) Travel frequency: 2 times per month
 - iv) Travel period: 3 to 5 days per trip
 - v) Team: medical doctor (1), medical technologist (1 or 2), statistician (1), driver (1)
 - vi) Equipment and materials to be transported: microscope, reagents, training devices
- Short distance
 - i) Purpose of visit: meeting/conference with DOH, TBCS, etc.
 - ii) Travel distance: Approx. 30 km (one way)

2) Voltage Fluctuation and Measured Results

Voltage fluctuation data is shown below. The voltage fluctuations measured both every one second and every 20 seconds show that the differences between maximum and minimum voltages were less than 10 volts. This value is less than 5% of the nominal voltage of 230 volts, and that the voltage fluctuation measured was at an acceptable level to operate an equipment. But major and non-robust equipment will be equipped with voltage stabilizers, since spike-shaped voltage changes were not detected with this measurement. The computers are to be equipped with uninterrupted power supply (UPS).

VOLTAGE FLUCTUATION (volt)

(dormitory)

	Maximum Voltage	Minimum Voltage	Diff. Between Max & Min	Mean Voltage
20-sec intervals	231.1	221.5	9.6	228.1
1-sec intervals	228.2	220.3	7.9	224.3

Oct 14, 1999 2:30-3:45 pm

(main building)

	Maximum Voltage	Minimum Voltage	Diff. Between Max & Min	Mean Voltage
20-sec intervals	231.9	223.2	8.7	226.7
1-sec intervals	227.4	223.0	4.4	225.3

Oct 14, 1999 4:00-5:20 pm

3) Planned equipment

The list of planned equipment is shown in the appendix.

(6) Building Material Plan

1) Basic Policy

The proposed building materials 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. In particular, the following matters shall be considered:

- a) Local products shall be considered in order 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 ease of maintenance;
- c) Building materials that are suitable for the function as the National Tuberculosis Reference Laboratory shall be selected;
- d) Method of construction and local materials will be selected, with reference to analogous facilities; and
- c) The control of quality during the construction phase shall be taken into consideration.

2) Main Materials

a) Structural Materials

Reinforced concrete shall be used for the main frames and concrete block work for the walls. For the roof structure, a steel frame shall be selected.

b) Exterior Finishing

i) Exterior Finishing

Weather-proof Epoxy paint should be used for the exterior finishing materials, considering local climate, durability and maintenance.

ii) Roofs

Metal roofing will be selected.

iii) Windows and Doors

In consideration of durability, waterproofing, and airtightness, aluminum windows are a better choice than wooden windows, and steel flash shall be used for doors.

Security grill is planned at the 1F for safety.

iv) Floors

Ceramic tiles will be used for this Project, because of its excellent wearing characteristics. Corridor floors are best finished with non-slip ceramic tile surface.

c) Interior Finishing

i) Floors

Vinyl sheet will be used for general rooms such as staff room, meeting room and lecture room, and chemical resistant vinyl sheet will be used for rooms in which chemicals are used, such as culture and susceptibility test laboratory, routine laboratory and training laboratory.

ii) Walls

Interior walls will be finished with emulsion paint on mortar bed, similar to the existing RITM.

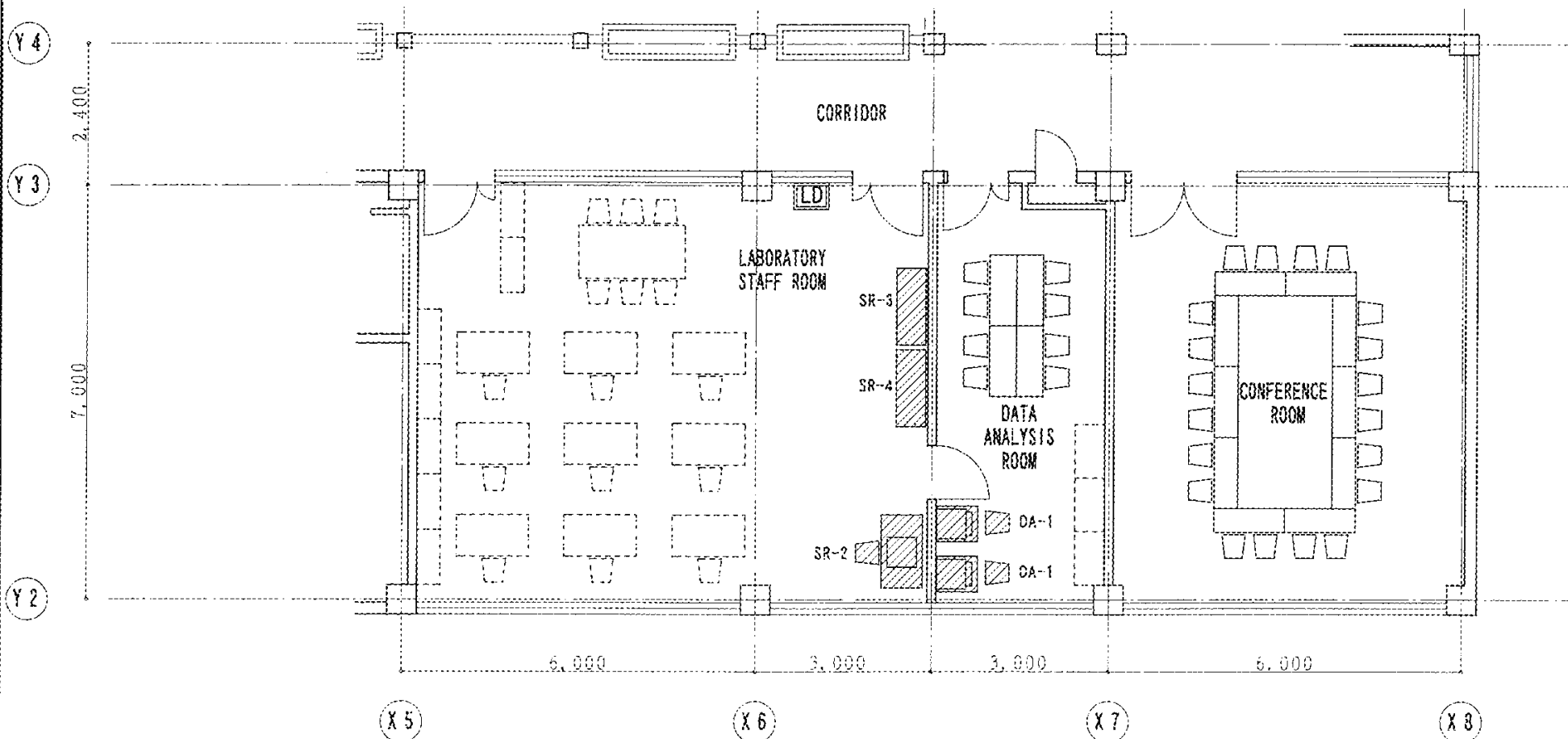
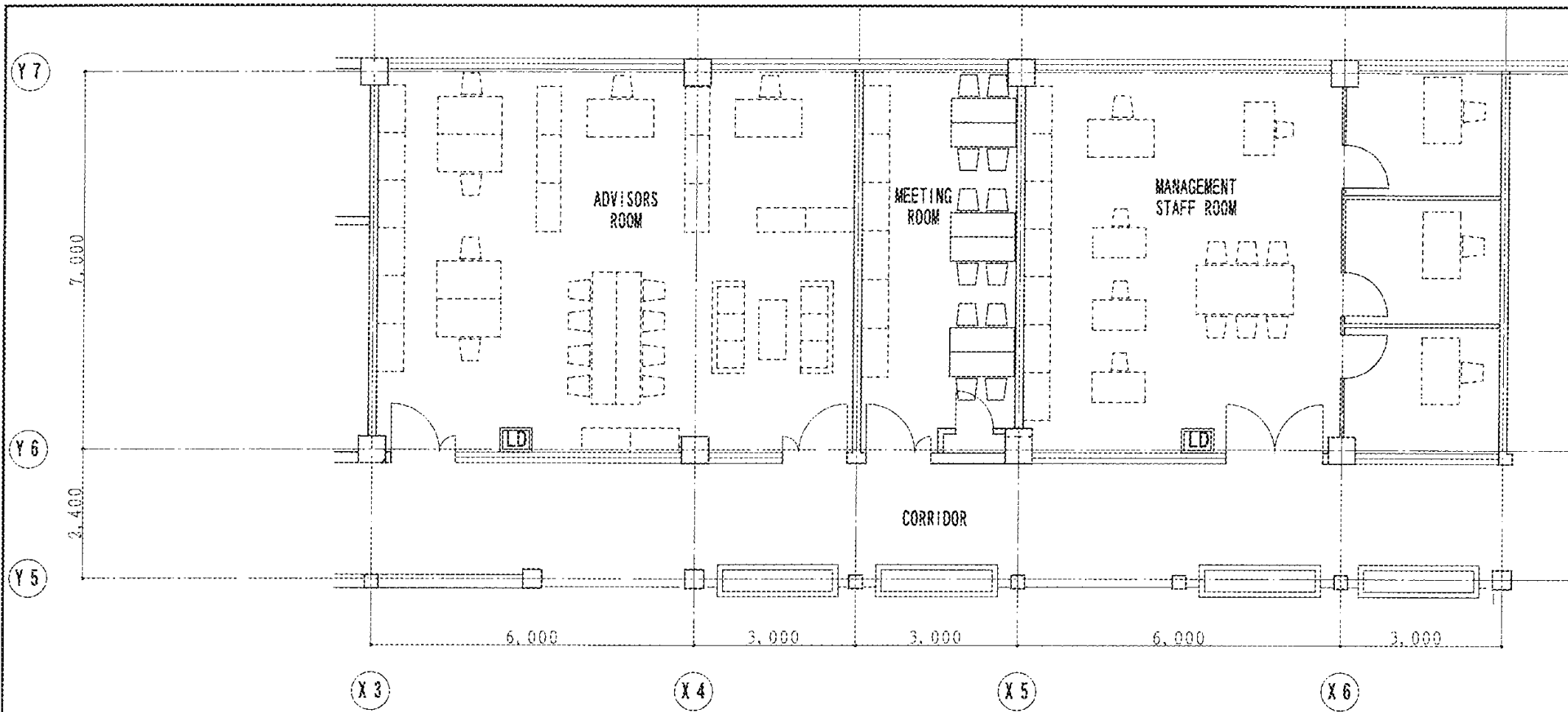
iii) Ceilings

The rooms of the existing RITM have a painted finish on plaster ceiling. However, a system ceiling will be used because of easy maintenance except the laboratories.

Table 2-3-4 Proposed Construction Materials

Structure		Reinforced concrete and steel structure				
Floor height		4,000 mm				
Exterior Finishing	Roof	Metal Roof				
	Eaves	Non-asbestos cement board, Epoxy painting				
	Exterior walls	Trowelled Mortar, Sprayed Epoxy painting, Louver: Perforated block (Concrete block or with exterior paint)				
	Fittings 1) Windows 2) Doors	1) AW 2) SD	Aluminum Steel			
	Exterior Floor	Ceramic tile on Mortar bed				
	Exterior Ceilings	Hard Wood Strip OSCL				
Interior Finishing	Rooms	General Rms.	Laboratory, Training Room	Meeting Rm.	Warehouse	Corridor
	Floor	Mortar bed Vinyl Sheet Baseboard PVC	Mortar bed Chemical Resistant Vinyl Sheet Baseboard PVC	Mortar bed Parquet Floor Baseboard Hard Wood	Mortar bed Vinyl Composition Tile Baseboard PVC	Mortar bed Ceramic tile Baseboard Tile
	Walls	Mortar bed EP paint	Mortar bed VP Paint	Wood finish	Mortar bed EP paint	Mortar bed Epoxy paint
	Ceilings	Rock-wool board System Ceiling	Rock-wool acoustic board	Rock-wool acoustic board	Plaster board with paint	Hard Wood Strip OSCL
	WC	Floor Walls Ceilings	Ceramic Tile Mortar bed, Vinyl paint (H ≥ 1,900) , Ceramic tile Cement board with paint			

(7) Basic Design Drawings and Equipment List



PLANNED EQUIPMENT

ROOMS	ITEM NO.	ITEMS	QTY set(s)
1F Data Analysis Rm.	DA-1	Computer complete system	2
1F Conference/Meeting Rms.	MT-1	Overhead projector	1
1F Conference/Meeting Rms.	MT-2	Screen	1
1F Meeting Rm.	MT-3	White board	1
1F Laboratory Staff Rm.	SR-1	Binder	1
1F Laboratory Staff Rm.	SR-2	Computer complete system	1
1F Laboratory Staff Rm.	SR-3	Copier w/ sorter	1
1F Laboratory Staff Rm.	SR-4	Printing machine	1

LEGEND	
	PHILIPPINES SIDE
	JAPANESE SIDE (ARCHITECTURE)
	JAPANESE SIDE (EQUIPMENT)

1F

06/03/16

THE PROJECT FOR THE ESTABLISHMENT OF THE NATIONAL TUBERCULOSIS REFERENCE LABORATORY IN THE REPUBLIC OF THE PHILIPPINES

DATE	11/00	PROJECT	EQUIPMENT LAYOUT PLAN-1	NO. 01
REV.	15 JAN 2005	DESIGNED BY		
APPROVED BY		PROJECT MANAGER		
DATE		ARCHITECT		
DATE		ENGINEER		
DATE		CONTRACTOR		

PACIFIC CONSULTANTS INTERNATIONAL
K. ITO ARCHITECTS/ENGINEERS INC.

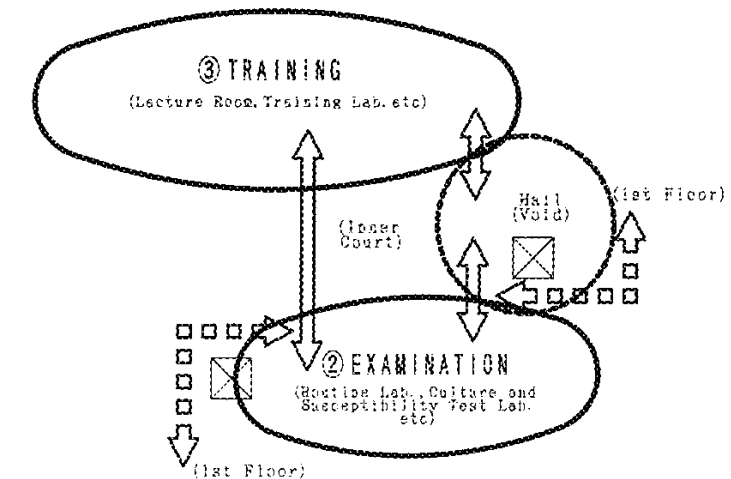
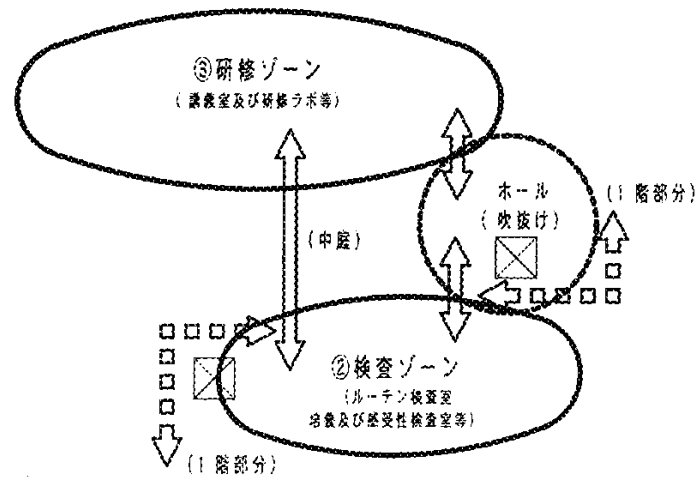
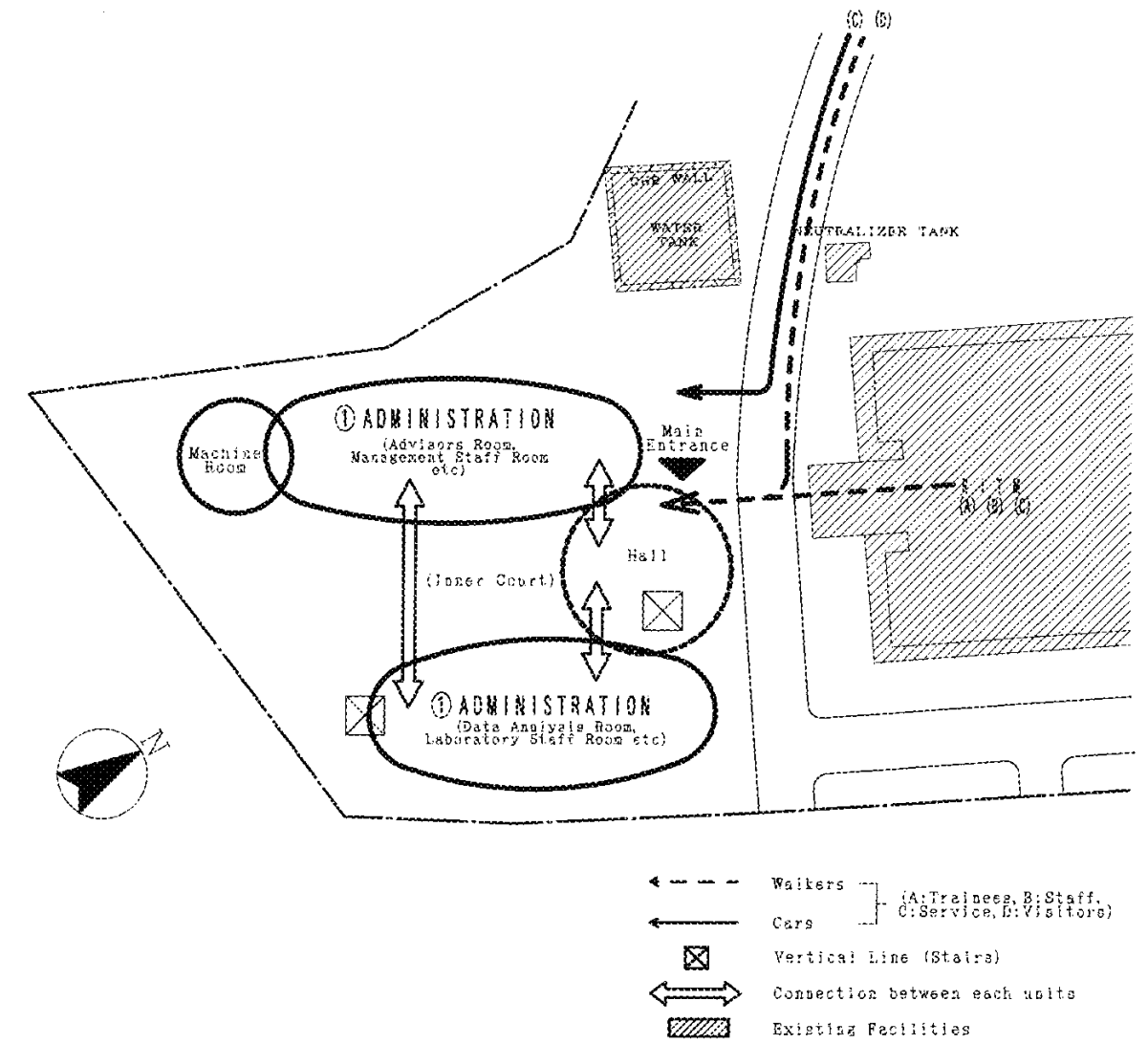
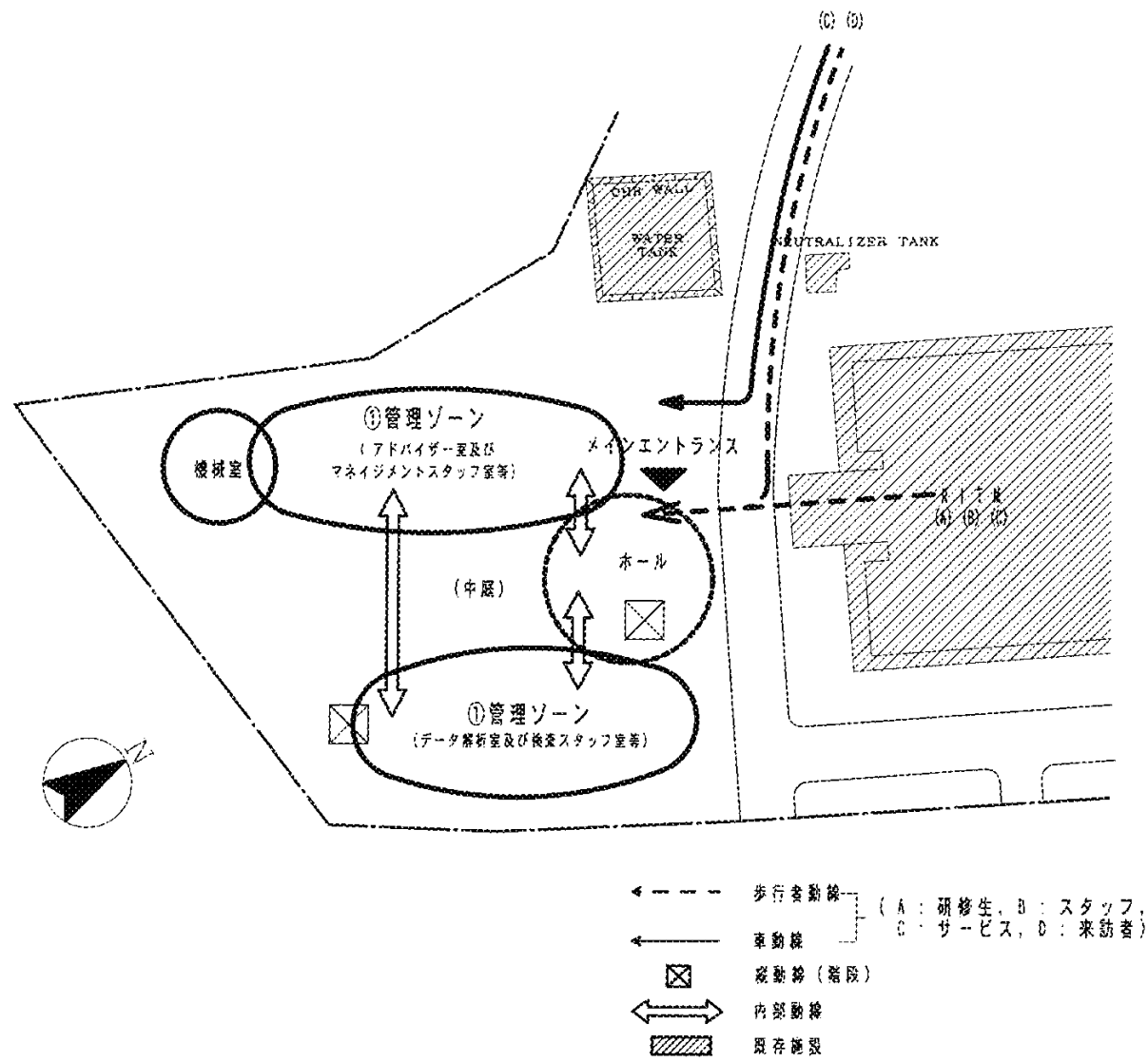
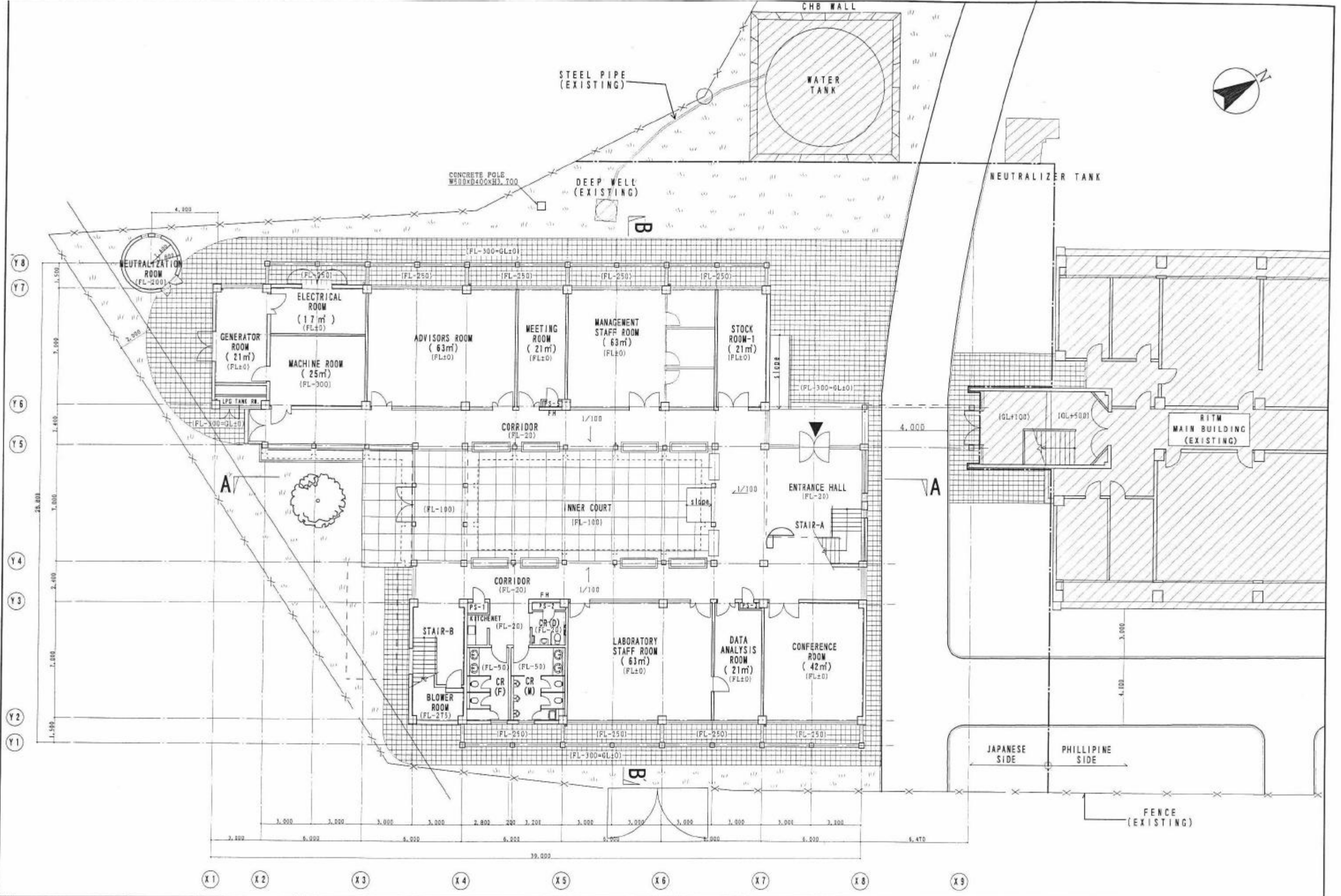


図 施設ゾーニング及動線検討図-2F

Fig Zoning and Traffic Line Plan - 2F

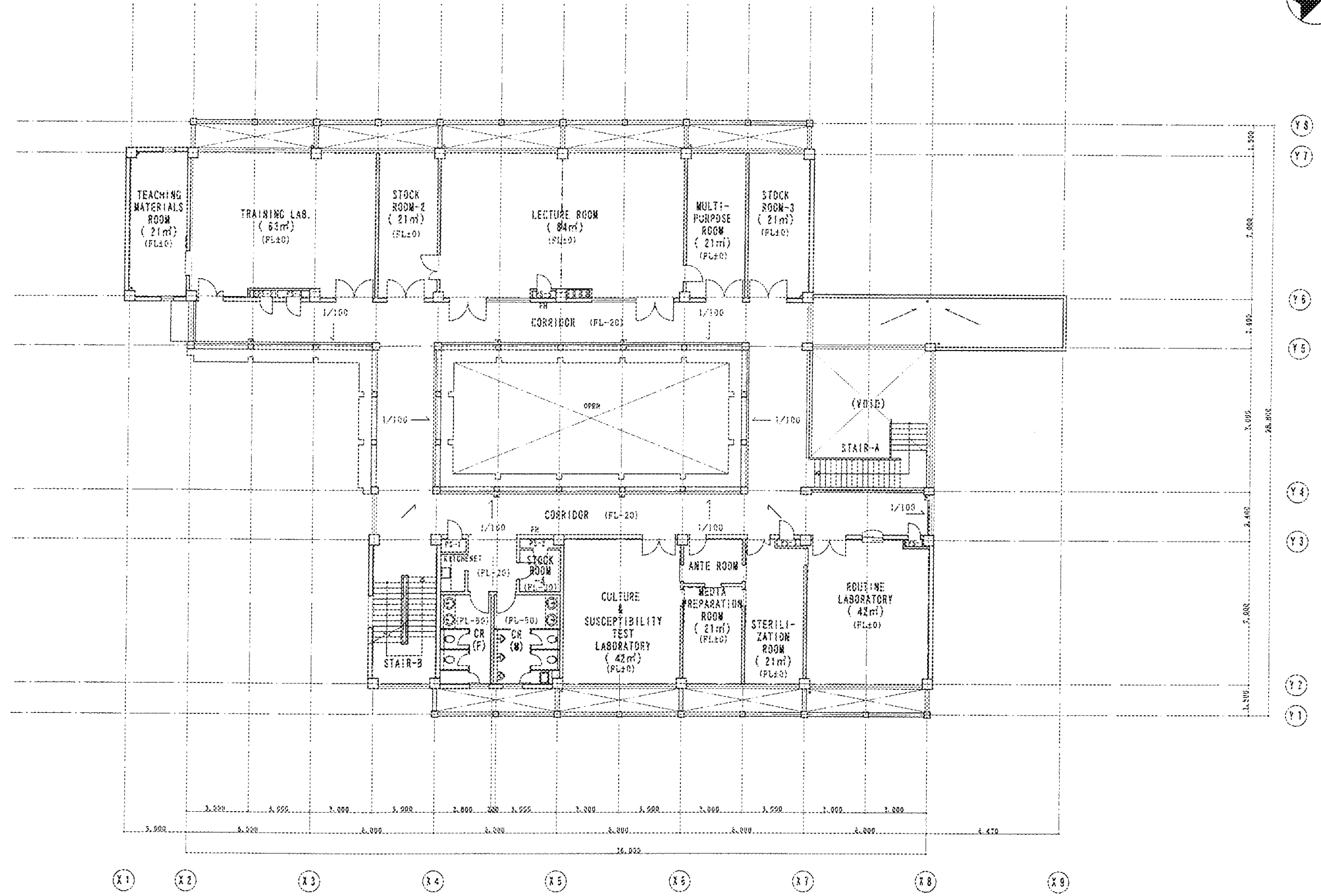
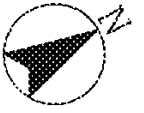


PROJECT: THE PROJECT FOR THE ESTABLISHMENT OF THE NATIONAL TUBERCULOSIS REFERENCE LABORATORY IN THE REPUBLIC OF THE PHILIPPINES

SHEET NO.:

DATE	1/1/00
DATE	18 APR 2000
DATE	
DATE	

SCALE	1:100	SHEET TITLE	1F PLAN	SHEET NO.	1
DESIGNED BY		REGISTERED BY	PACIFIC CONSULTANTS INTERNATIONAL		
CHECKED BY		REGISTERED BY	K. ITO ARCHITECTS&ENGINEERS, INC.		



THE PROJECT FOR
 THE ESTABLISHMENT OF THE NATIONAL TUBERCULOSIS
 REFERENCE LABORATORY
 IN THE REPUBLIC OF THE PHILIPPINES

DATE: 11-15-88

NO.	DESCRIPTION	DATE	BY
1	PRELIMINARY	11-15-88	...
2
3

2 OF 2 PLANS

PROJECT NO. 88-001

DATE: 11-15-88

DESIGNED BY: ...

DRAWN BY: ...

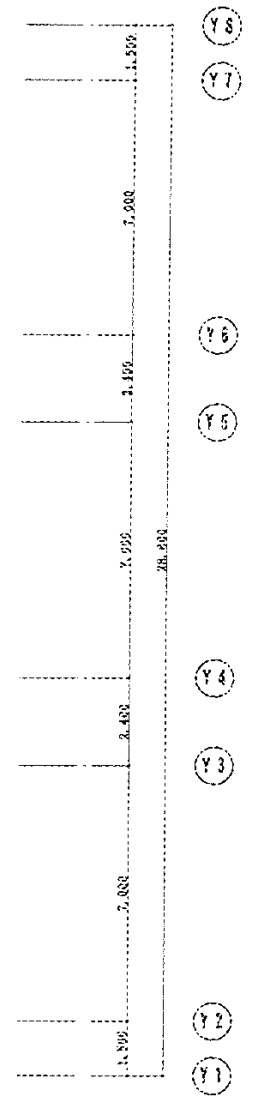
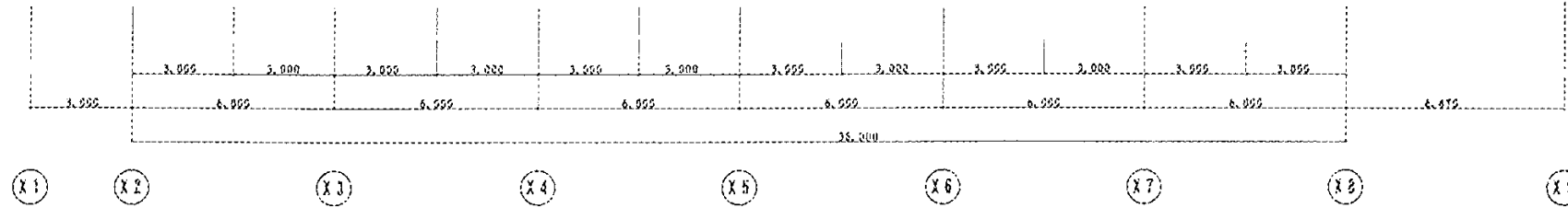
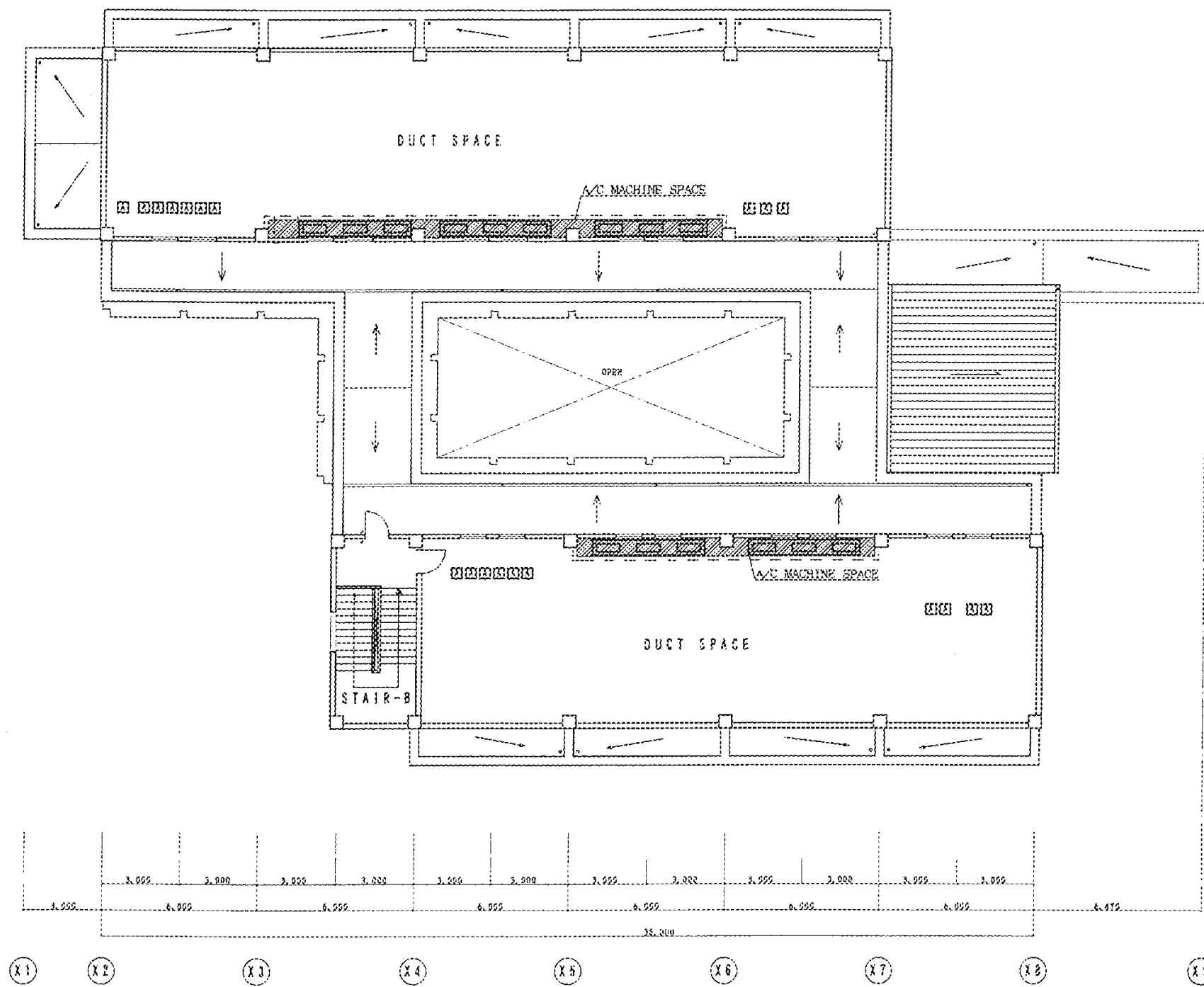
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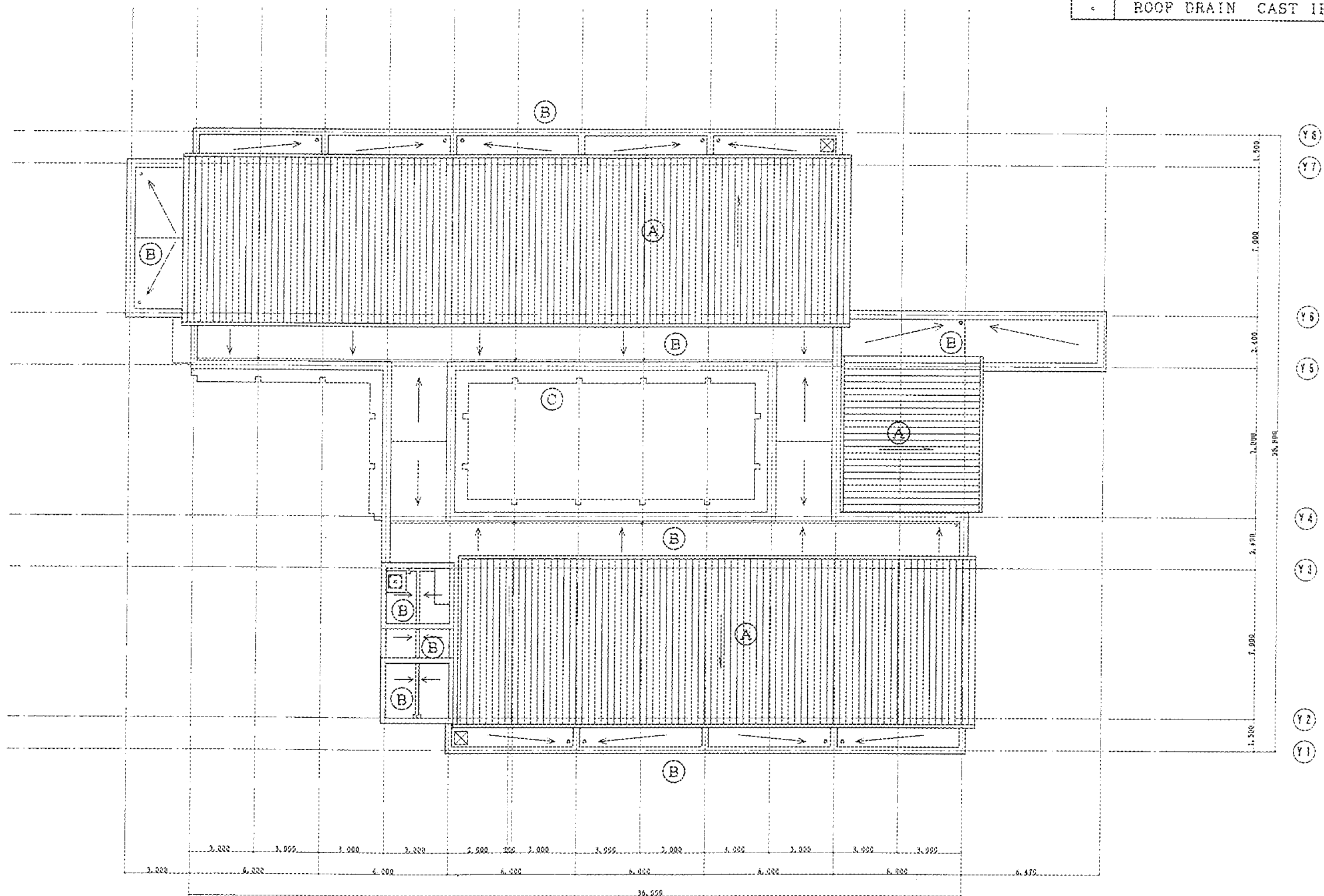
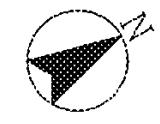
PACIFIC CONSULTANTS INTERNATIONAL
 K. ITO ARCHITECTS/ENGINEERS INC.



LEGEND		
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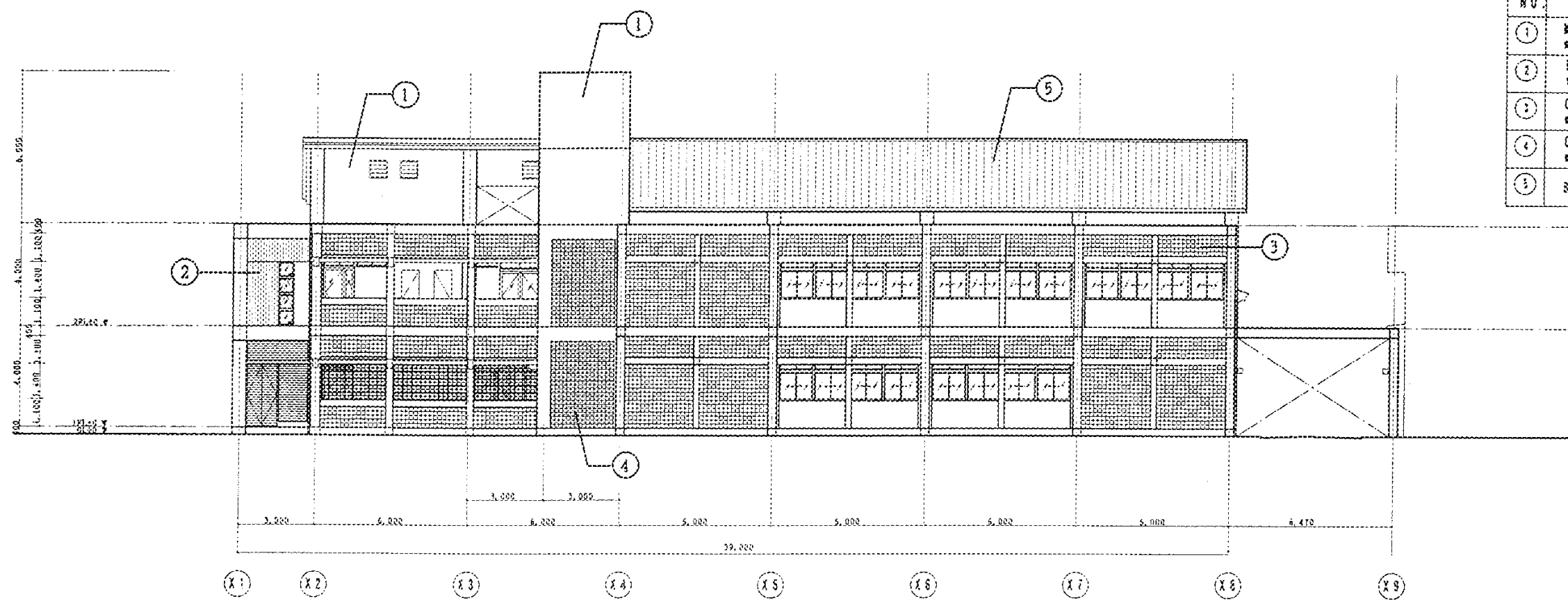
NO.	MATERIAL/FINISH
(A)	BATTEN SEAM COLOR ALUMINIZED STEEL SHEET t=0.5 ASPHALT ROOFING (35%) CEMENT BOARD t=10 GLASS WOOL (12%)
(B)	POLYURETHANE RESIN WATERPROOFING t=3.0 SILVER COLOR FINISH GUTTER: URETHANE RESIN COATING (WP)
(C)	MORTAR TROWEL: 1=25 W/8POXY SPRAY TILE
(D)	ROOF HATCH 600x600
•	ROOF DRAIN CAST IRON 100 /
•	ROOF DRAIN CAST IRON 75 /



PROJECT: THE PROJECT FOR THE ESTABLISHMENT OF THE NATIONAL TUBERCULOSIS REFERENCE LABORATORY IN THE REPUBLIC OF THE PHILIPPINES

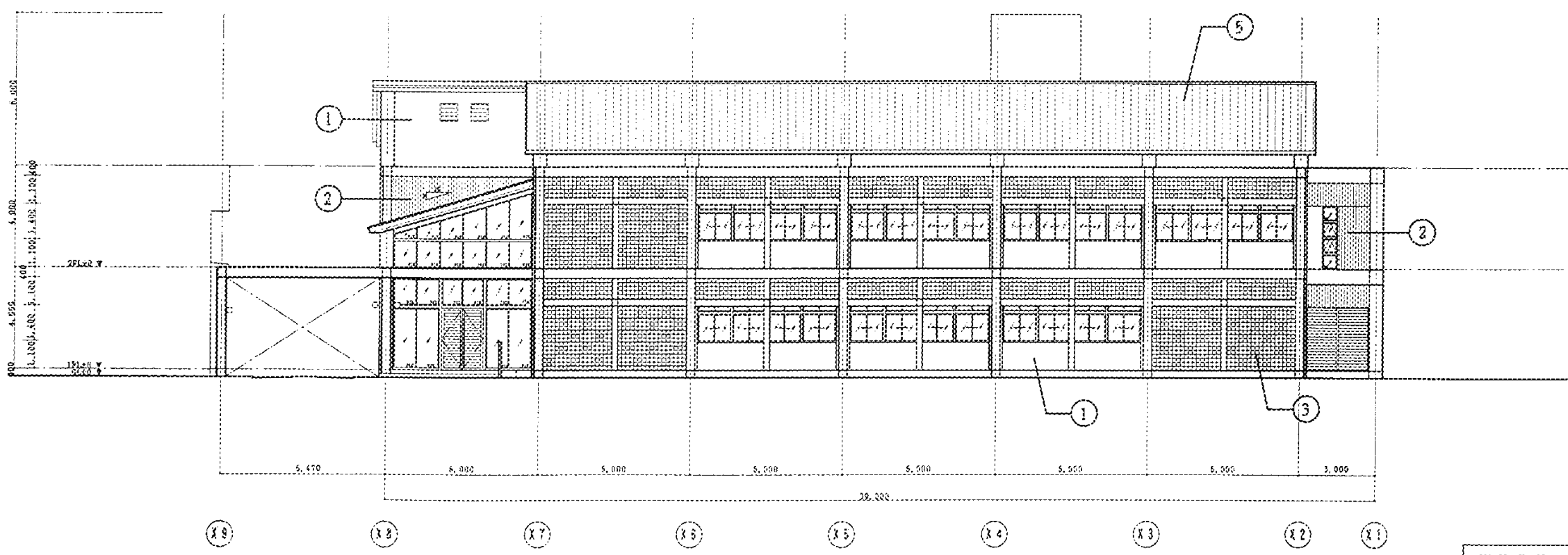
NO.	REVISION	DATE	BY	CHECKED BY

SCALE: 1:100	SHEET NO: 4
DATE: 10 20 2004	PROJECT: ROOF PLAN
DESIGNED BY: [Signature]	CHECKED BY: [Signature]
DRAWN BY: [Signature]	APPROVED BY: [Signature]
PREPARED BY: [Signature] PACIFIC CONSULTANTS INTERNATIONAL KATO ARCHITECTS/ENGINEERS INC.	



NO.	MATERIAL/FINISH
①	MORTAR TROWEL 1-25 w/EPOXY SPRAY TILE
②	MORTAR TROWEL RID w/EPOXY SPRAY TILE
③	CONCRETE BLOCK (SQUARE HOLE TYPE) w/EPOXY SPRAY TILE
④	CONCRETE BLOCK (SLIT TYPE) w/EPOXY SPRAY TILE
⑤	RATTEN SEAM COLOR ALUMINIZED STEEL SHEET

EAST ELEVATION

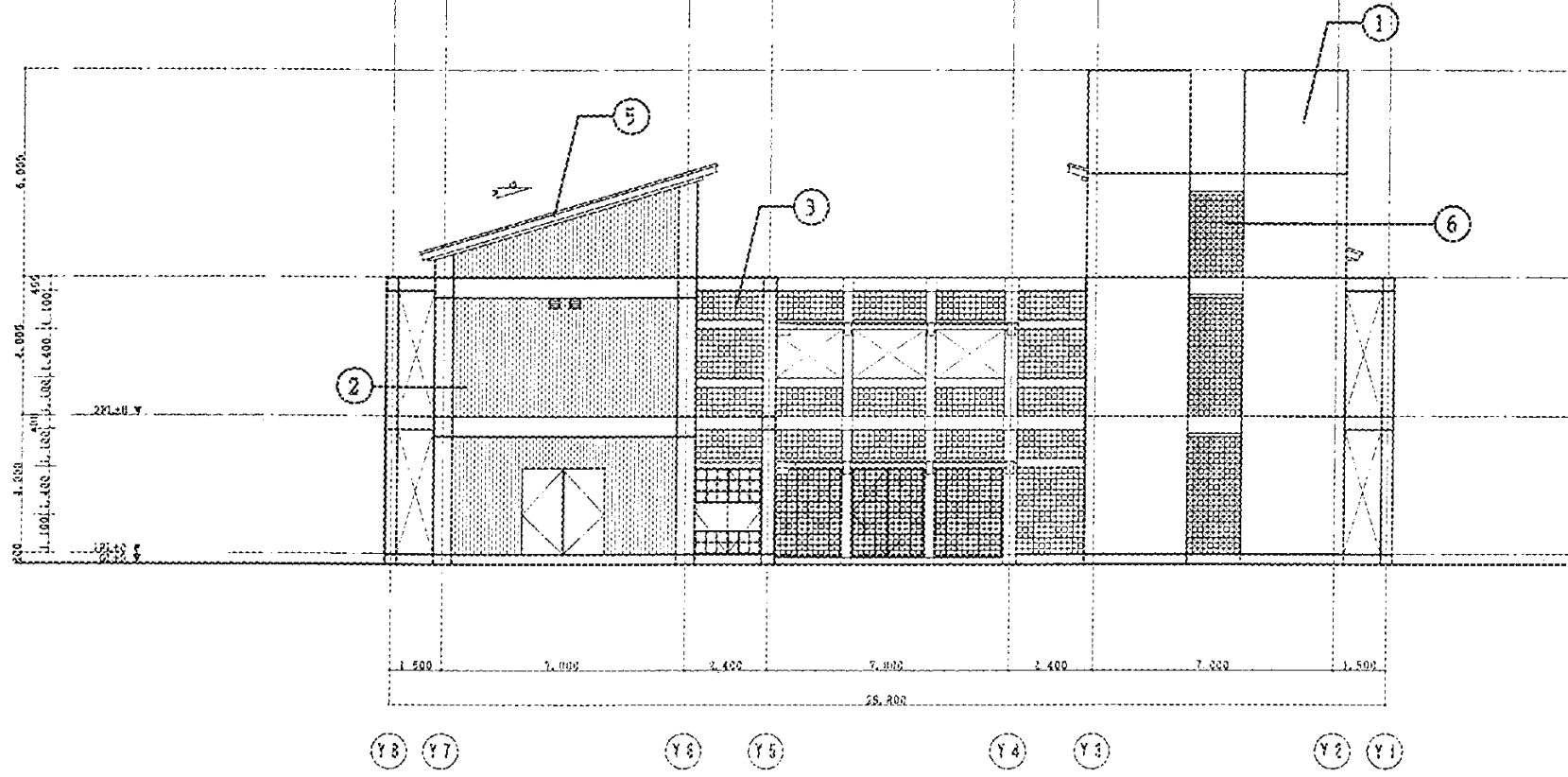


WEST ELEVATION

PROJECT: THE PROJECT FOR THE ESTABLISHMENT OF THE NATIONAL TUBERCULOSIS REFERENCE LABORATORY IN THE REPUBLIC OF THE PHILIPPINES

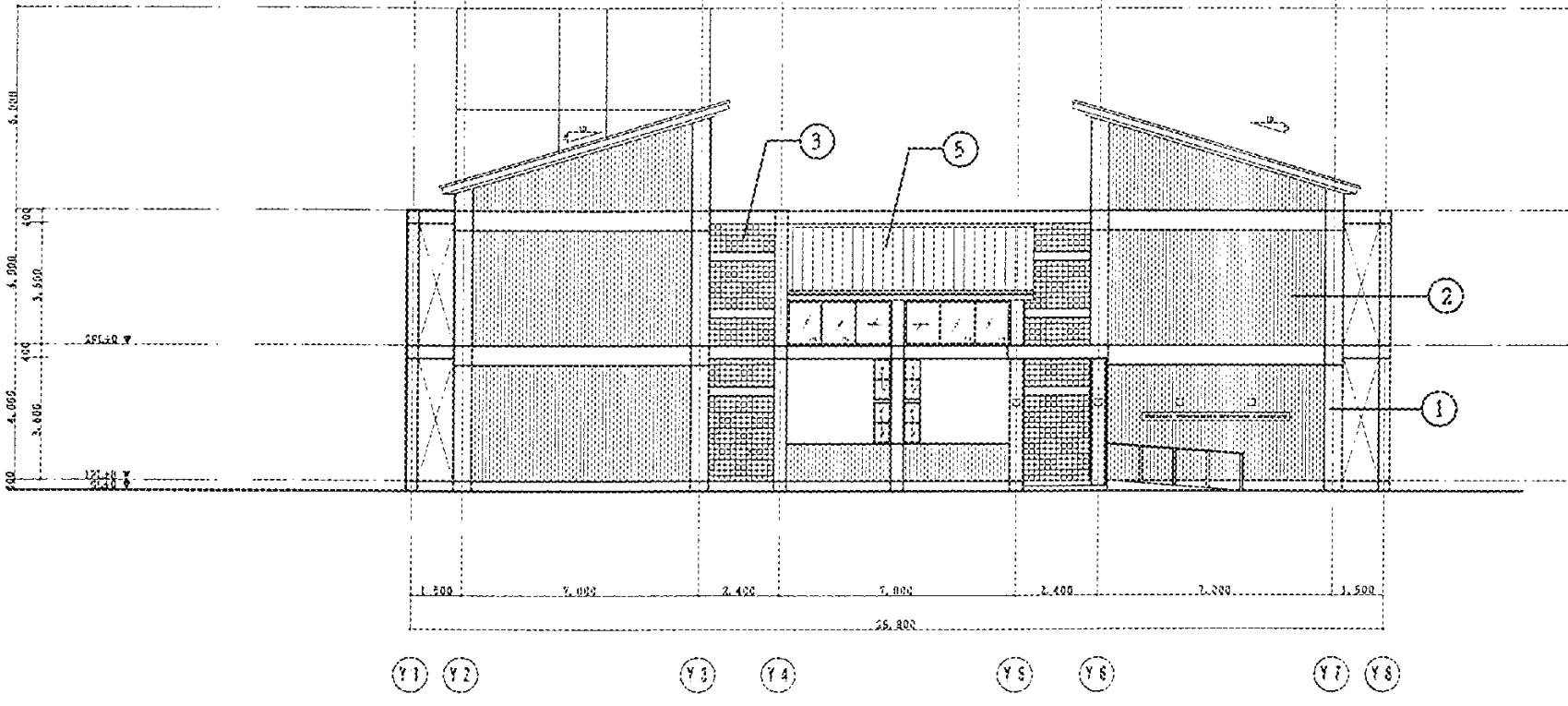
GENERAL NOTE

DATE: 1-1-00	NO. OF SHEETS: 5
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DESIGNED BY: [Signature]	REVISED BY: [Signature]
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PREPARED BY: PACIFIC CONSULTANTS INTERNATIONAL ARCHITECTS/ENGINEERS INC.	



NORTH ELEVATION

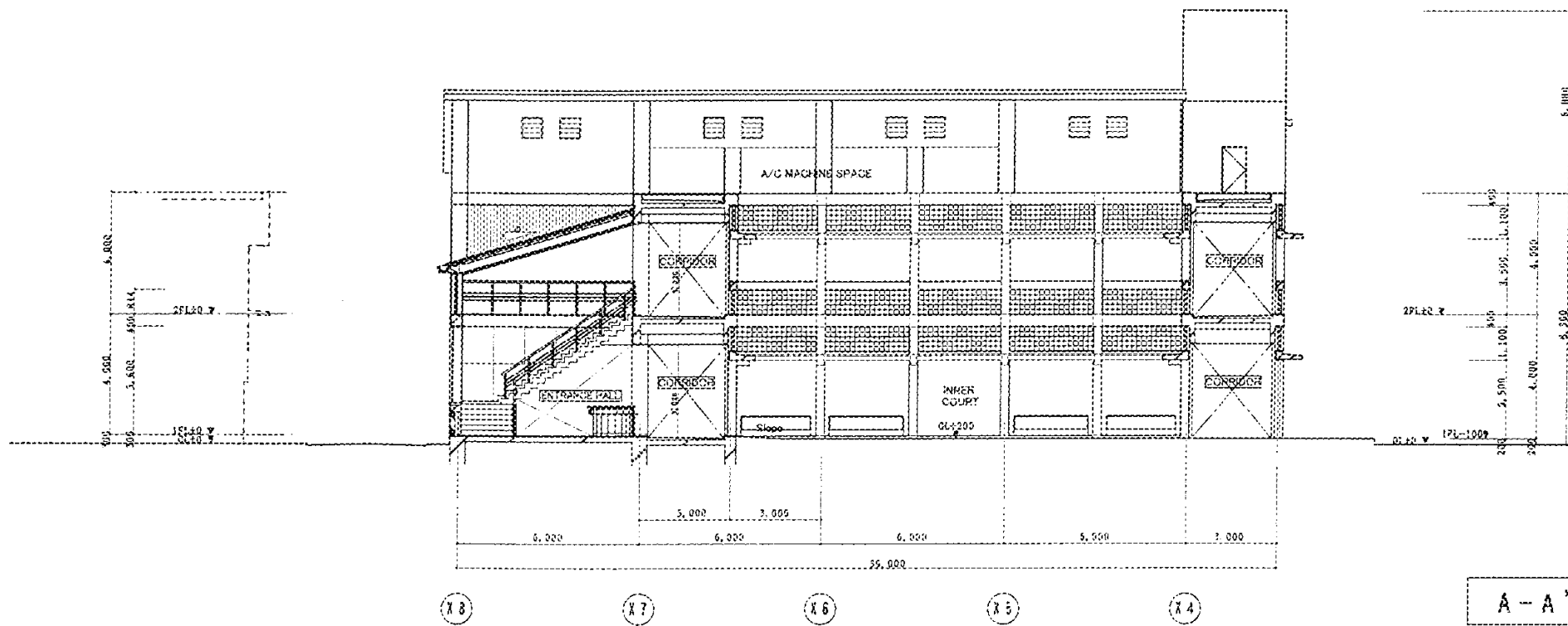
NO.	MATERIAL/FINISH
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②	MORTAR TROBEL RIB w/EPOXY SPRAY TILE
③	CONCRETE BLOCK (SQUARE HOLE TYPE) w/EPOXY SPRAY TILE
④	CONCRETE BLOCK (SLIT TYPE) w/EPOXY SPRAY TILE
⑤	BATTEN SEAM COLOR ALUMINIZED STEELSHEET
⑥	GLASS BLOCK 145X145X90 (HEAT REFLECTED GLASS)



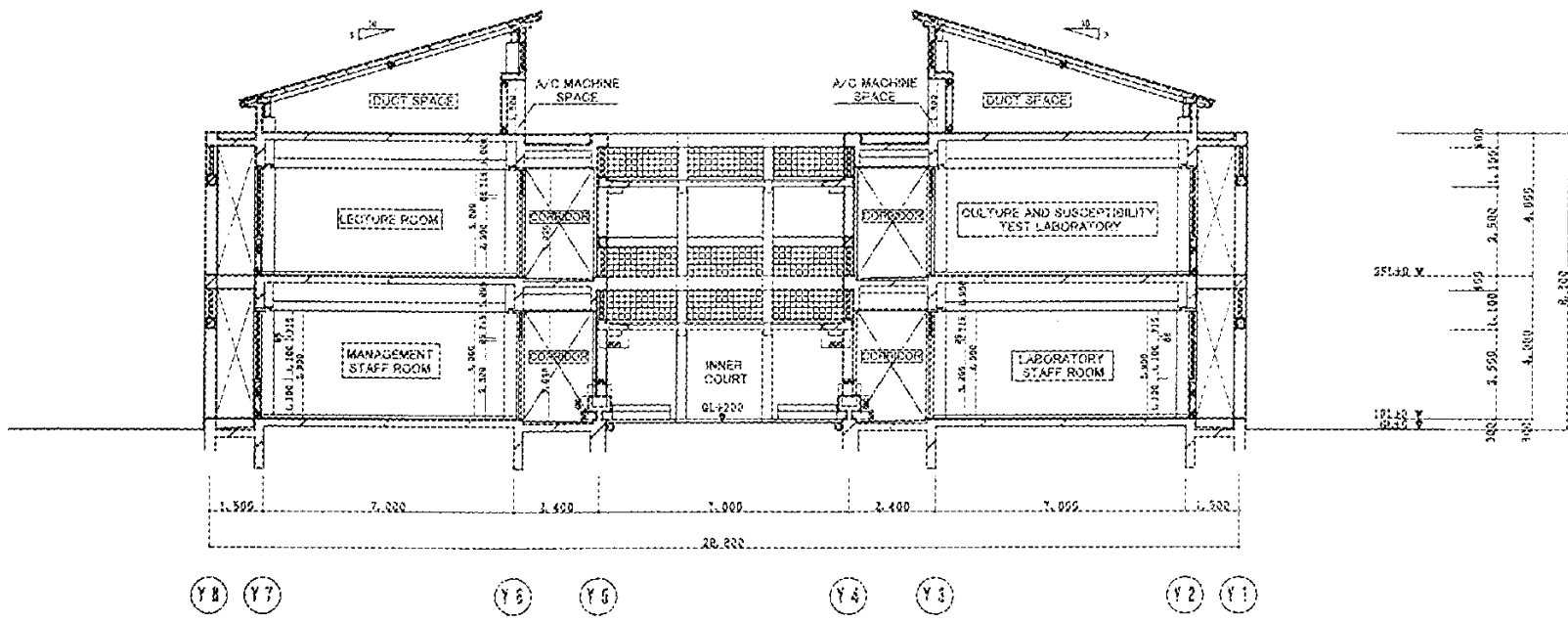
SOUTH ELEVATION

THE PROJECT FOR
THE ESTABLISHMENT OF THE NATIONAL TUBERCULOSIS
REFERENCE LABORATORY
IN THE REPUBLIC OF THE PHILIPPINES

DATE: 1-1-00	PROJECT: ELEVATION - 2	NO. 6
SCALE: 1/4" = 1'-0"	DESIGNED BY: K. ITO ARCHITECTS&ENGINEERS INC.	
DRAWN BY: K. ITO ARCHITECTS&ENGINEERS INC.		



A-A' SECTION



B-B' SECTION

PROJECT: THE PROJECT FOR THE ESTABLISHMENT OF THE NATIONAL TUBERCULOSIS REFERENCE LABORATORY IN THE REPUBLIC OF THE PHILIPPINES

GENERAL NOTE

DATE: 1-1-80	REVISED: 15 APR 2004	SECTION	7
DRAWN BY: [Signature]		PACIFIC CONSULTANTS INTERNATIONAL	
CHECKED BY: [Signature]		K. ITO ARCHITECTS/ENGINEERS INC.	

PLANNED EQUIPMENT

ROOMS	ITEM NO.	ITEMS	Q'TY set(s)
Culture Lab	CL-01	Autoclave	1
Culture Lab	CL-02	Centrifuge	1
Culture Lab	CL-03	Deep freezer	1
Culture Lab	CL-04	Glassware etc	1
Culture Lab	CL-05	Incubator	2
Culture Lab	CL-06	Lab tables and chairs	1
Culture Lab	CL-07	Medical cabinet	1
Culture Lab	CL-08	Microscope	1
Culture Lab	CL-09	Pharmaceutical refrigerator	1
Culture Lab	CL-10	Safety cabinet	1
Culture Lab	CL-11	Safety pipetter	1
Data Analysis Rm	DA-1	Computer complete system	2
Lecture Rm	LR-1	Overhead projector	1
Lecture Rm	LR-2	Projector for computer	1
Lecture Rm	LR-3	Slide projector	1
Lecture Rm	LR-4	Sound system	1
Lecture Rm	LR-5	TV/Video system	1
Prep Rm (M&R)	MR-1	Balance	1
Prep Rm (M&R)	MR-2	Balance	1
Prep Rm (M&R)	MR-3	Inspissator (Coagulator)	1
Prep Rm (M&R)	MR-4	Distilling apparatus	1
Prep Rm (M&R)	MR-5	Glassware etc	1
Prep Rm (M&R)	MR-6	Lab tables and chairs	1
Prep Rm (M&R)	MR-7	Magnetic stirrer	1
Prep Rm (M&R)	MR-8	Medical cabinet	1
Prep Rm (M&R)	MR-9	Refrigerator	1
Conference/Meeting Rms	MT-1	Overhead projector	1
Conference/Meeting Rms	MT-2	Screen	1
Meeting Rm	MT-3	White board	1
Prep Rm (Training)	PR-3	White board	1
Routine Lab	RL-1	Fluorescent microscope	1
Routine Lab	RL-2	Glassware etc	1
Routine Lab	RL-3	Lab tables and chairs	1

ROOMS	ITEM NO.	ITEMS	Q'TY set(s)
Routine Lab	RL-4	Medical cabinet	1
Routine Lab	RL-5	Microscope	4
Routine Lab	RL-6	Refrigerator	1
Routine Lab	RL-7	Safety cabinet	1
Routine Lab	RL-8	Thermostatic water bath	1
Staff Rm	SR-1	Binder	1
Staff Rm	SR-2	Computer complete system	1
Staff Rm	SR-3	Copier w/ sorter	1
Staff Rm	SR-4	Printing machine	1
Training Rm	TR-01	Autoclave	1
Training Rm	TR-02	Camera	1
Training Rm	TR-03	Glassware etc	1
Training Rm	TR-04	Lab tables and chairs	1
Culture Lab	TR-05-1	Loopcinerator	2
Routine Lab	TR-05-2	Loopcinerator	2
Training Rm	TR-05-3	Loopcinerator	6
Training Rm	TR-06	Medical cabinet	1
Training Rm	TR-07	Microscope	15
Training Rm	TR-08	Safety cabinet	2
Training Rm	TR-09	Safety cabinet	1
Training Rm	TR-10	Teaching microscope	1
Training Rm	TR-11	Teaching microscope	1
NA	VC-1	Vehicle	1
Routine Lab	WS-1	Autoclave	1
Prep Rm (W&S)	WS-2	Glassware dryer	1
Prep Rm (W&S)	WS-3	Hot air sterilizer	1
Prep Rm (W&S)	WS-4	Lab tables and chairs	1
Prep Rm (W&S)	WS-5	Medical cabinet	1
Prep Rm (W&S)	WS-6	Ultrasonic pipette washer	1
Prep Rm (W&S)	WS-7	Glassware etc	1

CHAPTER 3

IMPLEMENTATION PLAN

CHAPTER 3 IMPLEMENTATION PLAN

3-1 Implementation Plan

3-1-1 Implementation Concept

Understanding of Japan's Grant Aid Program is an essential part of the implementation of the Project. The procedures to be considered and confirmed for the Project are as follows:

(1) Basic Items

- 1) The Exchange of Notes (E/N) for the implementation of the Project shall be concluded between the Japanese Government and the Government of the Republic of the Philippines after the completion of the Basic Design Study in April 2000.
- 2) With the E/N, GOJ shall officially commit itself to assist and initiate specified action.
- 3) After the above-mentioned action, a consultant contract shall be concluded between a Japanese consultant and the Government of the Republic of the Philippines, and confirmation of 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 Documents, full details of facilities and proposed equipment plans should be discussed and confirmed with the implementation agency.
- 2) Consultant shall discuss the technical issues through meetings with the relevant authorities in Japan and the Philippines during the detailed design stage.
- 3) Tender for construction and equipment procurement shall be conducted in accordance with the guidelines of JICA.
- 4) The Consultant will assist the Implementation Agency for the said contract in accordance with the guidelines of JICA.

(3) Contractors

- 1) A Contractor to carry out the construction and a Contractor to supply the equipment are Japanese contractors. Those Contractors will undertake the construction work, supported by local contractor(s) sub-contracted to the Contractor and the supply and installation of the equipment.

- 2) Establishment of the careful logistic plans and schedules for construction and procurement of both equipment and materials are the major factors in formulating an implementation schedule.

(4) Implementation Organization

The organizations involved in this project are as shown below:

- 1) The Department of Health (DOH) of the Government of the Philippines is responsible for the administration of the Project.
- 2) RITM, TBCS and BRL are the agencies that will implement the Project with a Japanese consultant and contractor. The Health Infrastructure Service (INF) of DOH will take charge of the technical matters.

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

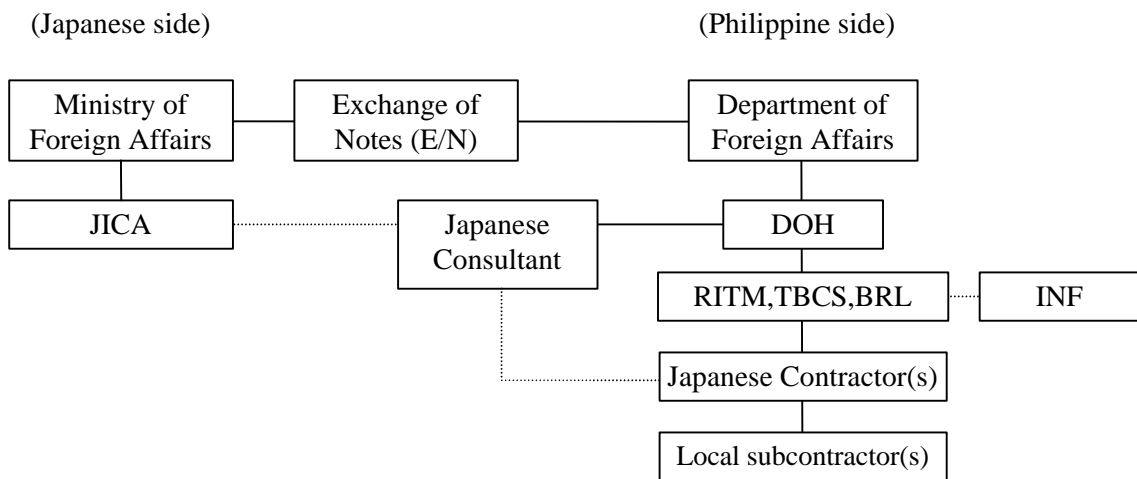


Figure 3-1 Implementation Organization

3-1-2 Implementation Conditions

The construction condition in the Philippines, and the issues to be considered during the construction stage are as follows.

- 1) The project site is situated at the southern part of the RITM compound and the available space for NTRL is limited. Temporary storage of materials will be off-site, in an area of approximately 1,500m², due to the lack of available area.
- 2) The temporary access for construction will be from the main entrance of RITM to the existing dormitory. The safety of the patients and staff access and egress from the ward area must be considered.
- 3) Construction of the CDC building and the BPS building is scheduled to be started in May 2000, and Research Avenue (approach road to RITM) is also currently under construction by Filinvest. Construction schedules of both projects must be considered.
- 4) The site for NTRL is well drained. However, the rainy season, from June to November, shall be considered in the construction schedule.
- 5) The construction method shall avoid any excessive vibration and noise which may disturb the existing ward, facilities and housing.
- 6) The transportation plan, such as transportation route and estimated time, will take traffic congestion in Metro Manila into account.
- 7) The application procedures required in the Philippines, such as approval of construction and procurement plans including any expense are to be undertaken by INF.

3-1-3 Scope of Works

The scope of work of the Japanese side and the Philippine side for the implementation of Japan's Grant Aid Program is shown in Table 3-1.

Table 3-1 Scope of Works

Responsibility of the Japanese Side	Responsibility of the Philippine Side
(1) Building Works Structural works, finishing works	(1) <u>Site Preparation</u>
(2) Electrical Works Power trunk facilities, lighting, power outlets, P/A systems	a) Ground preparation works: (Demolish the Staff House, basketball court and fence, and grading)
(3) Utilities and Facilities	b) Access road
a) Water Supply Providing water treatment system and related internal piping work	(2) <u>External Works</u> - Landscaping, planting, and fencing, etc. within the Site.
b) Sewerage system including piping works up to the connection manhole	(3) <u>Utilities and Facilities for New Buildings</u>
c) Sewage treatment plant and neutralization plant	a) Water Supply Providing well water supply
d) Reserve water tank and elevated water tank	b) Waste Drainage Providing waste drainage piping
e) Fire-extinguishing facilities	c) Storm Drainage Relocating the existing piping and providing storm drainage piping
f) Electrical supply and cabling work from low voltage receiving panel to service entrance	d) Electrical Work Providing power supply
g) Power Generator	e) Telecommunication Work Providing telephone line
h) Telecommunication system Providing new PABX, telephones and wiring work	f) Public address system Connecting between the existing system and new system
i) Public address system Providing new amplifier and relevant work	g) Local Area Network Connecting between the existing system and new system
j) Local Area Network Providing new system	h) Fire alarm system Connecting between the existing system and new system
k) Fire alarm system	(4) <u>General Furniture</u>
l) Lightning Protection System	(5) <u>Others</u>
h) Lighting system in the site	a) Governmental works including the application for Governmental approvals and permissions
(4) Exterior Work Road, path and parking lots within the site	b) Smooth customs clearance, tax exemptions and prompt internal transportation for the imported construction materials and equipment
(5) Equipment Equipment for research and training	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
(6) Electric Room, Electric Generator Room, Pump Room	(6) Management, operation and maintenance cost for the new building and facilities
	(7) Tax exemptions and necessary preferential treatment for the construction staff from Japan or a third country
	(8) Smooth entry, re-entry and departure to/from the Philippines for the Japanese technical staff
	(9) All expenses, other than those to be borne by the Japan's Grant Aid within the scope of the Project

The estimated budget prepared with INF, and approved by RITM, is shown in Table3-2 .

Table 3-2 Required Budget for Work of the Philippine Side

Items	Budget (Philippine pesos)
Site Preparation	286,815.27
Connecting of facilities between existing buildings and NTRL	926,312.73
Access Road	1,600,648.15
External Works	184,629.82
Others	294,218.18
Total	3,292,624.15

Source: INF

3-1-4 Consultant Supervision

The scope of the supervision is as follows:

(1) Review and approval of the construction plans, drawings, etc.

Review and issue the approval of the construction plans, construction schedules, work drawings, materials, samples, equipment lists, etc. submitted by the Contractor.

(2) Management of the construction schedule, etc.

Give instructions to the Contractor and review the progress report submitted by the Contractor in order to complete the construction work etc. as scheduled. In the event that the construction work to be carried out by the Government of the Philippines is delayed, the Consultant may urge to accelerate the construction work of the GOP.

(3) Quality control

Check and approve the quality of materials and construction works in accordance with the specifications. Furthermore, the materials and equipment imported from Japan or other countries will be checked, when needed.

(4) Check of the finished product

Check the finished products and confirm the quantity.

(5) Assistance with payment procedure and issuance of certificates

Assist with the procedures of checking bills, etc. and issue certificates with regard to the export of construction materials and equipment, payment of construction expenditure, completion of construction, expiration of warranty period and so forth, if necessary.

(6) Check and submission of monthly progress reports

Check and review the monthly progress reports, documents and photos submitted by the Contractor and report the progress of the construction work to the GOP and JICA.

Consultant shall also prepare and submit the completion report to JICA in accordance with the Grant Aid Program Guidelines.

(7) Others

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

3-1-5 Procurement

(1) Procurement of Building Materials

All building materials will be procured in the Philippines except for roofing materials. As a result of consideration as to endurance, roofing materials will be procured from Japan.

(2) Procurement of Equipment

1) Local Procurement

It is planned to procure the photocopier and computers with related peripheral devices of Japanese manufacturers from local agents or local distributors in the Philippines, taking after-sales service and maintenance into consideration.

2) Procurement in Japan

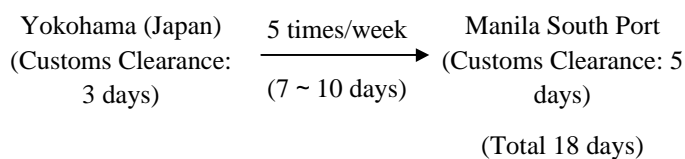
It is planned to procure most of the medical equipment, such as incubators, safety cabinets, microscopes, fluorescence microscope, laboratory tables and chairs, in Japan.

(3) Transportation Plan

1) Overseas Transportation

The schedules and expected routes of transportation are described as follows:

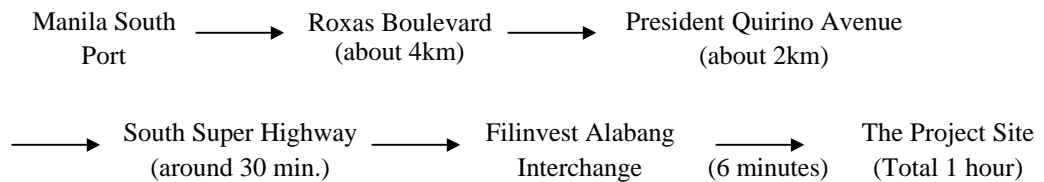
From Japan to the Philippines



2) Transportation by Land

In order to alleviate traffic in Metro Manila during the day, trucks are banned from 7:00 in the morning until 9:00 in the evening. Therefore, the route from Manila South Port to the project site is planned as follows:

From Manila South Port to the Project Site



3-1-6 Implementation Schedule

The tentative implementation schedule for the Project is shown in Figure 3-2. The Philippine side shall undertake site preparation, such as demolishing the staff house and basketball court, and constructing the access road, starting from June 2000.

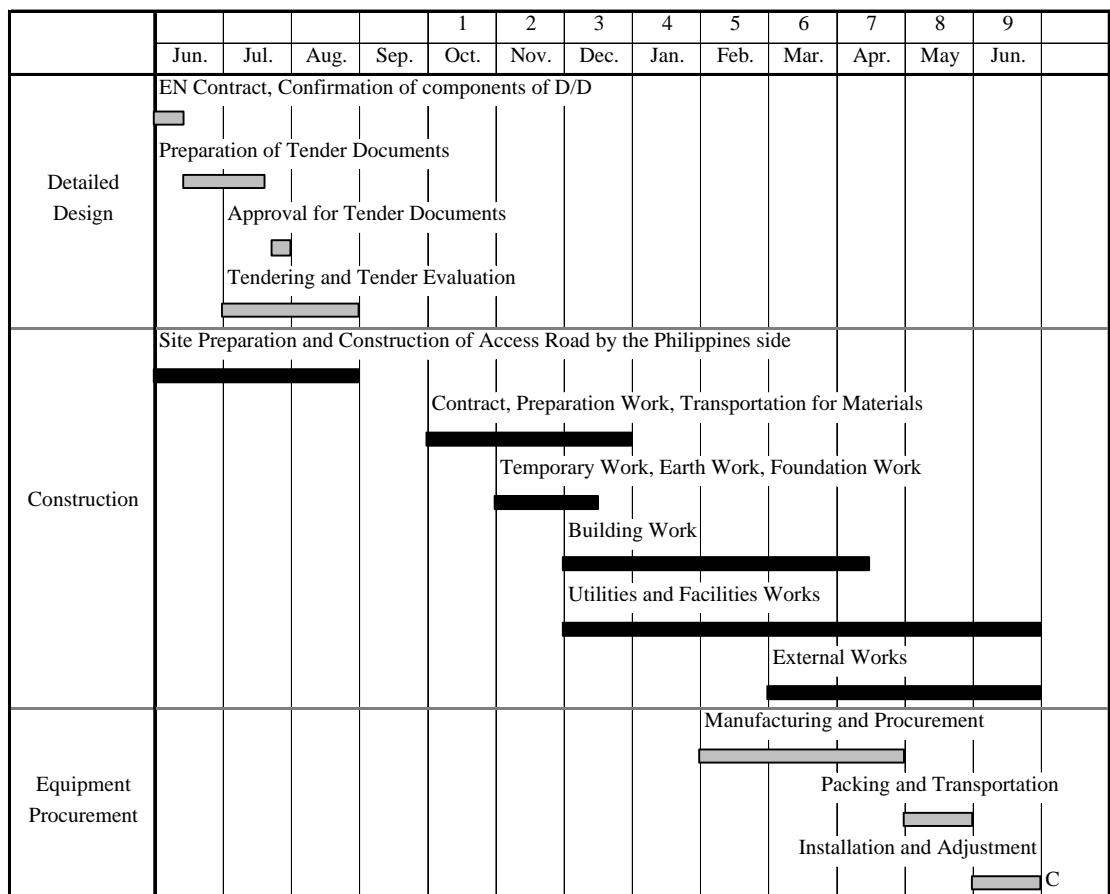


Figure 3-2 Overall Schedule of the Project

3-2 Operation and Maintenance Plan

3-2-1 Operational Body

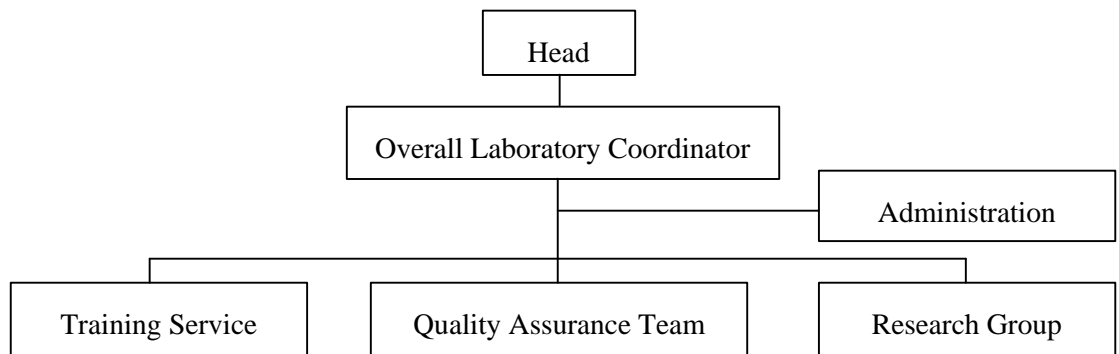
(1) Project Implementing Agencies

The National Tuberculosis Reference Laboratory (NTRL), which will be under the RITM, is the responsible agency for the execution of the Project.

(2) Project Facility Management Organization

1) Management and Operation Organization

After the completion of this Project, the new buildings will be operated by NTRL itself except the maintenance of the building and equipment. The planned organization chart of NTRL is shown below.



Source: DOH

Figure3-3 Organization of the NTRL

2) Planned Staff Members

The planned staff number is 28 persons and the distribution is shown in Table 3-3. -

Table 3-3 Planned Staff in NTRL

Specialty/Function	Numbers
Head	1
Overall Laboratory Coordinator	1
Training Service	
Medical Specialist	1
Medical Technologist	5
Laboratory Aide	4
Quality Assurance Team	
Medical Specialist	1
Medical Technologist	4
Research Group	
Medical Specialist	6
Medical Technologist	2
Administrative Staff	
Clerk	2
Driver	1
Total	28

Source: DOH

(3) Budget

1) Current condition

The past and present budgets of DOH and RITM are shown in the following table. The fiscal year in the Philippines starts from January and ends in December.

Table 3-4 National Budget of DOH and RITM

(Unit: 1,000 peso)

	1996	1997	1998	1999
National	394,855,182	433,817,543	546,743,816	585,097,506
DOH	9,301,912	11,020,083	13,059,476	11,265,838
RITM	76,692	76,335	91,760	96,538

Source: DOH

2) Budget for NTRL

The overall budget of year 2000 for NTRL has not been allocated as yet. However, the budget of the Philippine side for site preparation, such as demolition of the staff house and construction of access road, has been allocated for the 2000 fiscal year.

3-2-2 Maintenance and Management Plan

(1) Maintenance and Management Plan for Facility

The present organization charts of RITM for maintenance and management are shown in Appendix-9. It is divided into two bureaus, the Technical Bureau and Equipment Bureau. The operation and maintenance are performed based on “Health Facilities Maintenance Manual 1995” published by INF.

An outside private company, P.P.RAMOS CONTRACTOR GENERAL SERVICE, has executed the maintenance under the maintenance supervisor in RITM, which costs 400,000 pesos per month excluding consumption tax and spare parts.

(2) Maintenance and Management Plan for Equipment

Since the new National TB Reference Laboratory (NTRL) will be established as one of the research institutes in the territory of RITM, it is confirmed that the Biomedical Engineering Section of the General Services Department, RITM, will also be responsible for the service and maintenance of NTRL’s building and equipment.

The organization of RITM’s General Services Department is shown in the Appendix-9.

(3) Running Cost

1) Electricity Cost

a) Conditions		
Maximum Demand	120kw	
Lord Factor	0.3	
b) Schedule of Electricity Charge by MERALCO		
Demand Charge:	220 P/kw	
Energy Charge:	3.42 P/kwh	
c) Monthly Electrical Cost		
Demand	120kw x 220 P/kw	=26,400
Energy	120kw x 720 H/Month x 0.3 x 3.42 P/kwh	=88,650
Total		115,050 (P/Month)
d) Annual Electrical Cost		
	115,050 P/M x 12 M/Year	= 1,380,600 (P/Year)

2) Telephone Cost

a) Conditions

Direct Line	2Line
Trunk Line	2 Line

b) Schedule of Telephone Charge by PLDT

Direct Line Rental:	1,000 P/Month
Trunk Line Rental:	1,500 P/Month

c) Monthly Telephone Cost

Direct Line Rental	1,000 P/Month x 2 Line	=2,000
Direct Call Charges	500 P/Month x 2 Line	=1,000
Trunk Line Rental	1,500 P/Month x 2 Line	=3,000
<u>Trunk Call Charges</u>	<u>5,000 P/Month x 2 Line</u>	<u>=10,000</u>
Total		16,000
<u>Tax (EVAT)</u>		<u>1,600</u>
Total		17,600

(P/Month)

d) Annual Telephone Cost

17,600 P/M x 12 M/Year=211,200 (P/Year)

3) Fuel Cost

a) Conditions

Standby Generator 60 KVA 3φ220V 60Hz	1 Unit
Fuel Consumption	11.5L/hr
Assuming one hr operation a week	

b) Fuel Cost

Diesel Fuel	11.06 P/L
-------------	-----------

c) Annual Fuel Cost

11.5 L/hr x 52 Weeks 11.06 P/L= 6,614 (P/Year)

4) LPG Cost

a) Conditions

LPG Consumption for Laboratory Equipment	1.5kg/day
--	-----------

b) LPG Cost

930 P/50 kg → 19 P/kg

c) Annual LPG Cost
 $1.5 \text{ kg/day} \times 260 \text{ Day/Year} \times 19 \text{ P/kg} = 7,410$
(P/Year)

5) Salary for Maintenance Staff

a) Present Salary of Maintenance Staff 400,000 P/Year

b) Present Maintenance Area 12,600m²

c) Maintenance Area for NTRL
 $400,000 \text{ P} / 12,600 \text{ m}^2 \times 1,500 \times 1.15 \times 12 \text{ months} = 657,143$
(P/Year)

6) Summary of Running Cost

Electricity Cost	1,380,600
Telephone Cost	211,200
Fuel Cost	6,614
LPG Cost	7,410
Salary for Maintenance Staff	657,143
<u>Others</u>	<u>118,229</u>
Total	2,381,196
	→ 2,381,000
	(P/Year)

7) Cost of operation and maintenance for a car

Salary of driver	9,000 x 12 months = 108,000(P/Year)
Gasoline Cost	1,920km x 12 months x 14.89 P/l = 343,066(P/Year)
Maintenance Cost	618,000 x 1% x 12 months = 74,160(P/Year)
	<u>(1% of original cost of the car / month)</u>
Total	525,226(P/Year)

(4) Cost for Training and Conference

NTRL shall hold training courses and conferences as shown in Appendix 11. The cost breakdown is as follows:

	peso/year
Basic Training Course	702,000
Quality Control Training Course	234,900
National TB Program Annual Conference	45,000
Regional TB coordinator meeting	6,000
Training for Provincial TB Coordinators	32,000
TB Association Quarterly Meetings	40,000
World TB Day	15,000
Central Supervisors Meetings	18,000
Annual work plan	3,000
TB/HIV awareness training Course	7,500
Meetings for Private Practitioners	60,000
Meetings with NGOs, Associations and community leaders	60,000
General Meeting	24,000
Others	124,740
Total	1,372,140

(Cost estimated from Budget for Training in Cebu Reference lab. and Rental Rate in RITM)

CHAPTER 4
PROJECT EVALUATION
AND RECOMMENDATION

CHAPTER 4 PROJECT EVALUATION AND RECOMMENDATIONS

4-1 Project Effect

The establishment of the National Tuberculosis Reference Laboratory, including the construction of building and procurement of equipment, is expected to strengthen the National Tuberculosis Control Program in the Philippines. It is also expected to expand and improve the quality of health service for TB control, by supporting the implementation of PTTC for National Tuberculosis Control Program.

Effects to be expected through the implementation of the TB control program under the National Tuberculosis Reference Laboratory as the Center for training, operations research, and laboratory network for TB are as follows:

(1) Improvement of Training Function

It is expected that TB control program at the national level will be strengthened by increasing the number of microscopists. At the same time, improving their capability will lead the improvement of examination accuracy.

(2) Improvement of Research and Examination Function

The NTRL will be able to improve the operations research activities being a national laboratory. It will also act as a center for TB control by supporting research activities for biological examination, anti-TB drug resistance test, etc.

(3) Enhancement of Planning and Policy-making Functions

By improving the TB examination functions as the National TB Reference Laboratory, various kinds of research regarding bacteriological smear examinations, anti-TB drug resistance and so forth will be facilitated. Thus, the NTRL will be expected to play a pivotal role in the national TB control activity.

(4) Direct Benefit for TB Patients in NCR and Region 3

Smear examination will be done daily at the Routine Laboratory, which will contribute to keep and upgrade the abilities of laboratory personnel. Materials for sputum smear examination will be collected from RITM and neighboring hospitals and clinics. In this regard, TB patients in neighboring areas will be able to directly benefit from this system.

4-2 Recommendation

The magnitude of the Project's expectations is immense for TB control. However, in order for the Project to succeed, the full cooperation and concerted effort by the GOP from the following points are strongly requested:

(1) To improve Training Program and Quality of Instructors

One of the main functions of NTRL is training of trainers who, in turn, train the microscopists working in the Rural Health Units and validators working in validation centers in the provincial level. Such trainer's training, except for a small scale training done by CRL under the PTTC, was not executed. It is necessary to improve the training skills of trainers by gaining experience under the PTTC program.

(2) To establish Operation and Maintenance System of Facilities and Equipment

The NTRL building will be constructed in the RITM compound. RITM has their own operation and maintenance staff including 20 members for facility maintenance and 6 for equipment maintenance. However, RITM's budget for operation and maintenance is not enough to cover the procurement of spare parts and the repair of equipment, except for daily maintenance. It is deemed necessary to set aside adequate budget for the proper operation and maintenance of RITM and NTRL.

(3) To Establish a Self-funding System

Operating costs are covered by the budget from the Government and Donors in principle. Although, it is important to secure adequate budget from the Government, it is also necessary to consider a self-financing system (such as the introduction of a service charge system), because of the limitation of the national budget.

(4) Provision of Budget and Schedule Control by the Philippine Side

It is essential for the smooth implementation of the Project to provide an adequate budget and a schedule control for the works to be executed by the Philippine side.

In particular, the demolition of the Male Dormitory and construction of approach road are required to be completed by the Philippine side prior to the commencement of the construction of the NTRL building.