4.3 Basic Plan

4.3.1 Network Planning

(1) Service Menu

The System provides voice grade circuits. Telephone sets and facsimile machines (G3 type) are to be connected to the System. Automatic sequential information delivery from the Hub station by a facsimile machine is also possible.

(2) Required Switching Functions

The outline of the switching functions is as follows:

- Communications between terminal equipment connected within the System
- Automatic connection within the System

(3) Satellite Network Configuration

As shown in Figure 4.2, DAMA architecture between the Hub and VSAT stations is to be Star shaped and the radio channels are assigned by the Demand Assignment Multiple Access (DAMA) method. However, Pre-assignment is also possible.

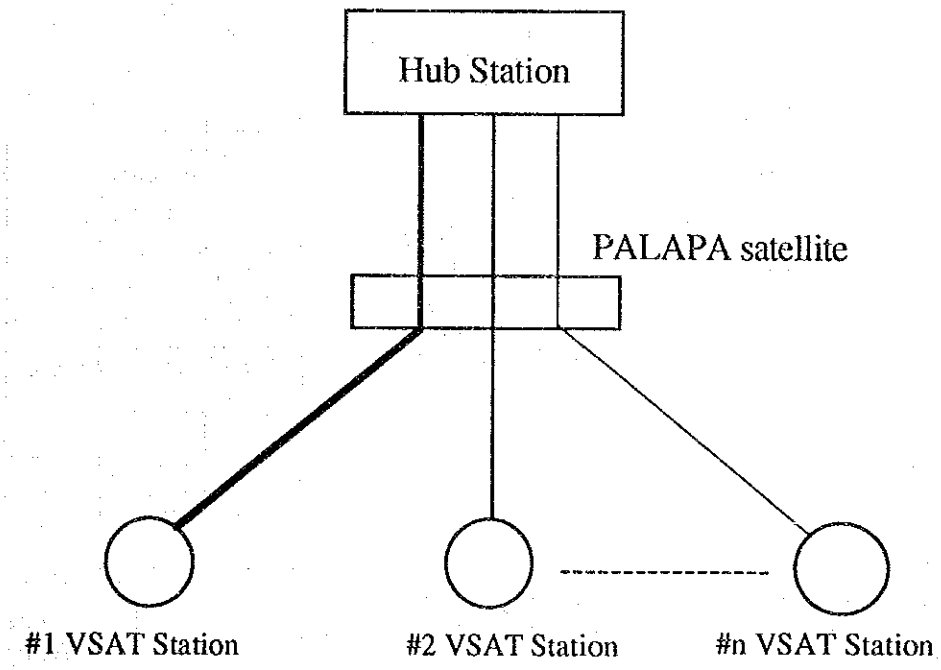


Figure 4.2 DAMA Architecture

(4) Circuit Configuration

Circuit configuration of the System satisfies the conditions of clause 4.3.1 item (2) "Required Switching Functions". The path and the concept is shown below:

(a) For communication between a VSAT station and the Hub station, a call signal from terminal equipment connected with the VSAT station equipment is entered to the Hub station via the satellite. It is exchanged through the PABX at the Hub station and connected with the object terminal equipment.

(b) For communication between VSAT stations, a call signal from terminal equipment is switched and returned at the PABX to the object VSAT terminal equipment.

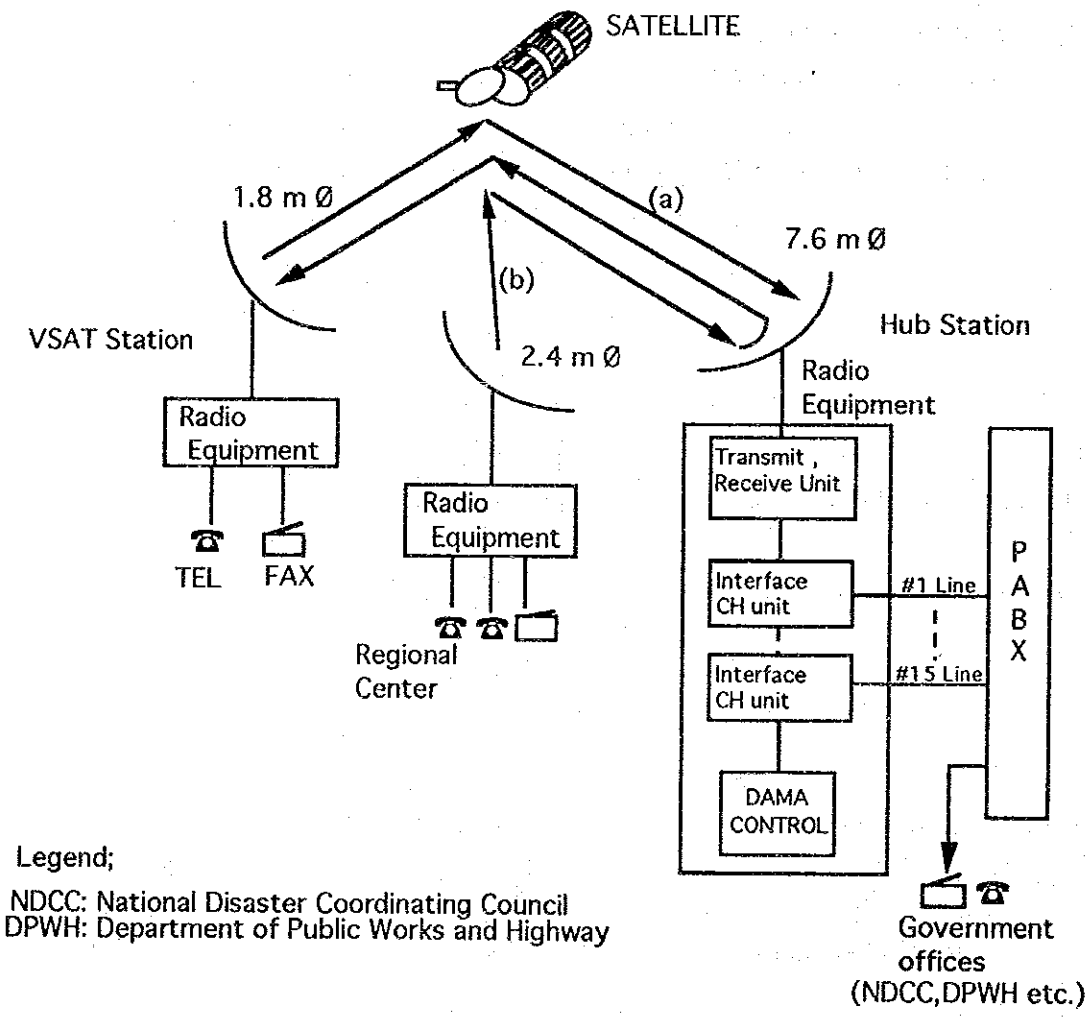


Figure 4.3 Circuit Configuration of the System

4.3.2 Equipment Plan

(1) Radio System

Main parameters of the radio system are shown in Table 4.2, based on the study result of clause 4.1 and 4.2.

Table 4.2 Main Parameters of Radio System

	Hub Station	VSAT Station
Satellite	PALAPA	
Frequency Band	C band Up Link 6 GHz Down Link 4 GHz	(Earth St.--> Satellite) (Satellite-->Earth St.)
Occupied Bandwidth	4,138 KHz	(equivalent to 1/8 of the transponder)
Number of Radio Channels	32 CHs	
Baseband Modulation	32 Kbps ADPCM	
RF Modulation	QPSK	
Communication Method	SCPC-DAMA	
Antenna Diameter	7.6 m ϕ	1.8 m ϕ /2.4 m ϕ
Number of Telephone Channels	15 CHs	Regional Center: 3 CHs Other station: 2 CHs
Tx Output Power	50 W	5 W

(a) Equipment Configuration

Examples of equipment configuration are shown in Figures 4.4 and 4.5.

(b) Appearance and Photos

Examples of equipment appearance and photos are shown in Figure 4.6.

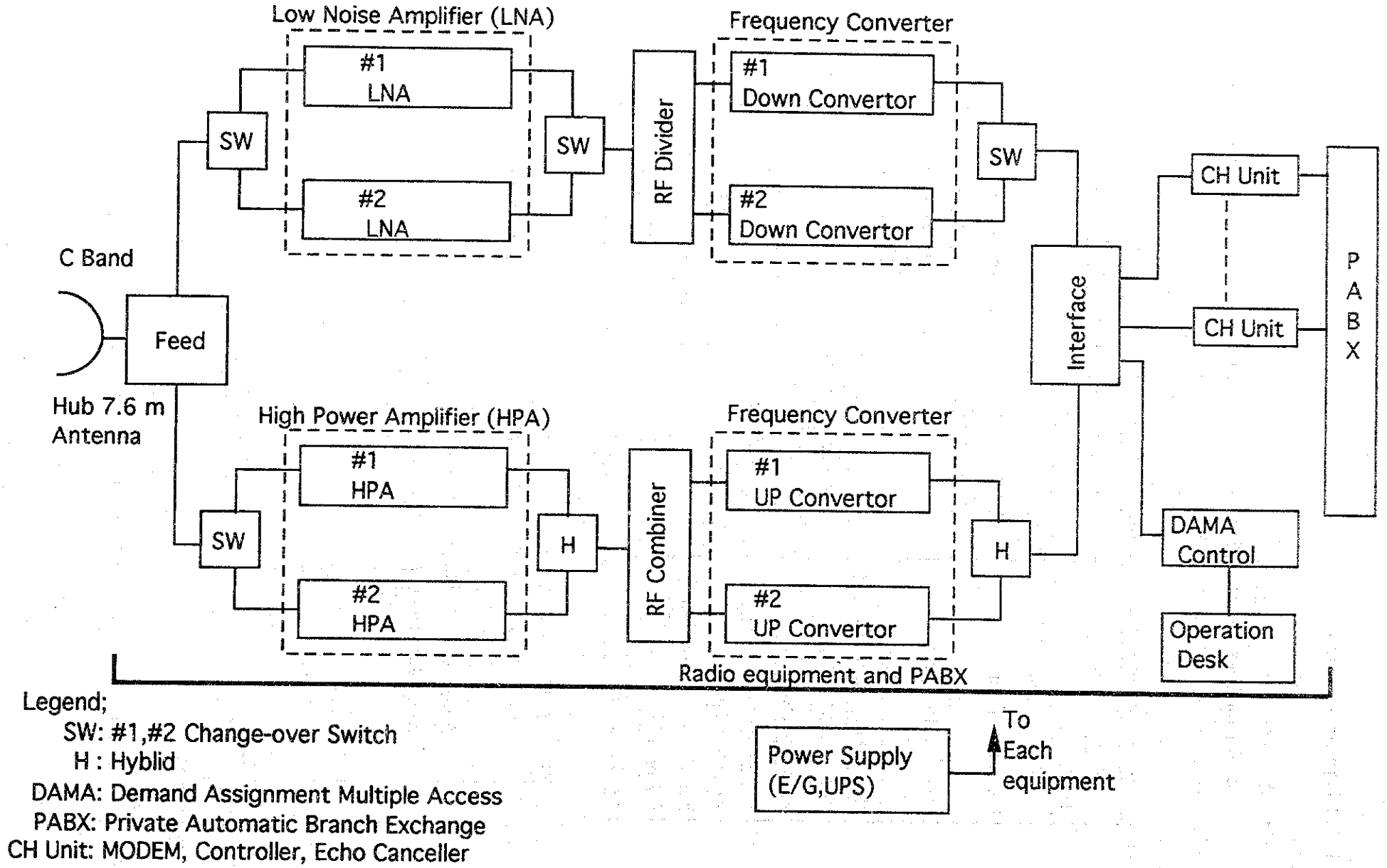


Figure 4.4 Example of Equipment Configuration at the Hub Station

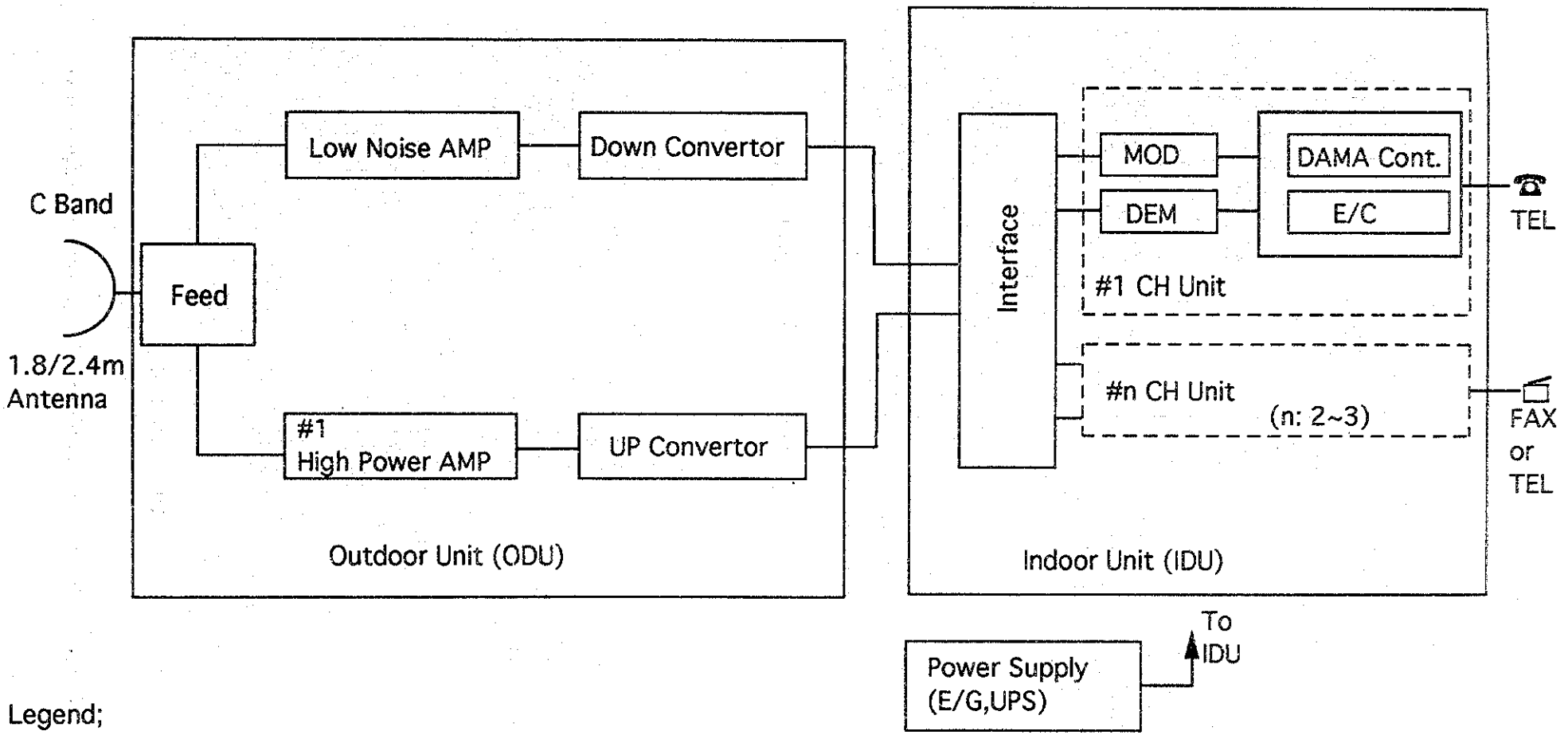
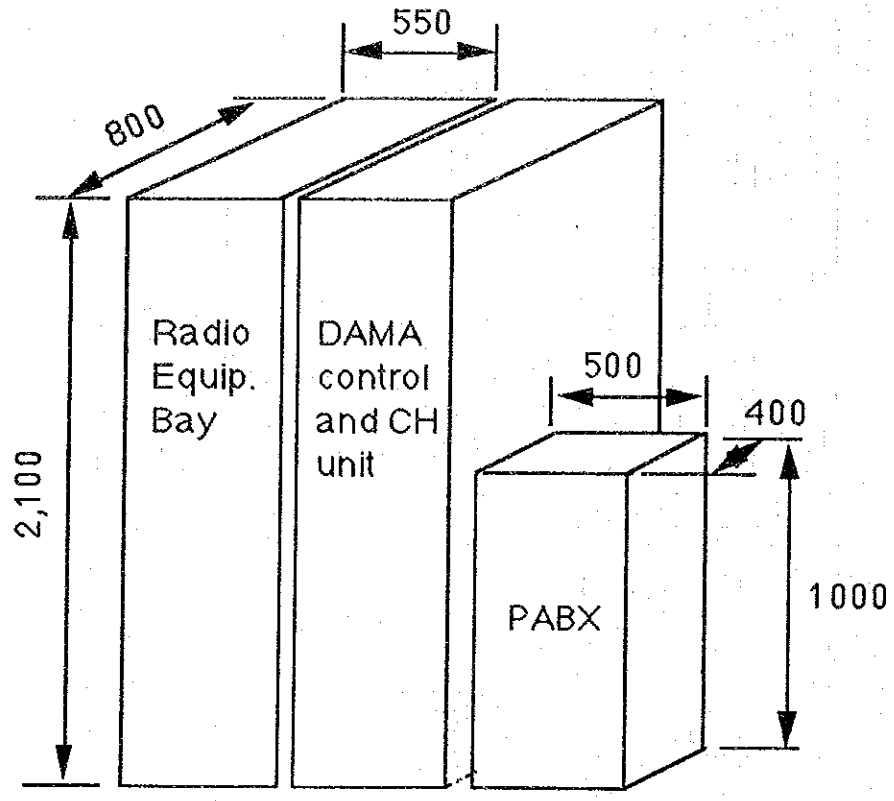
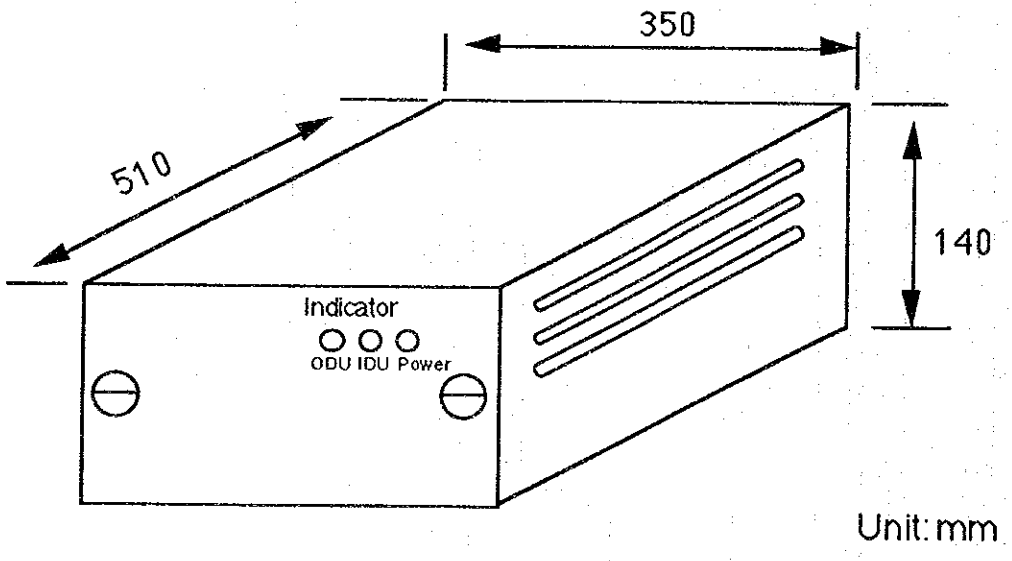


Figure 4.5 Example of Equipment Configuration at VSAT Station

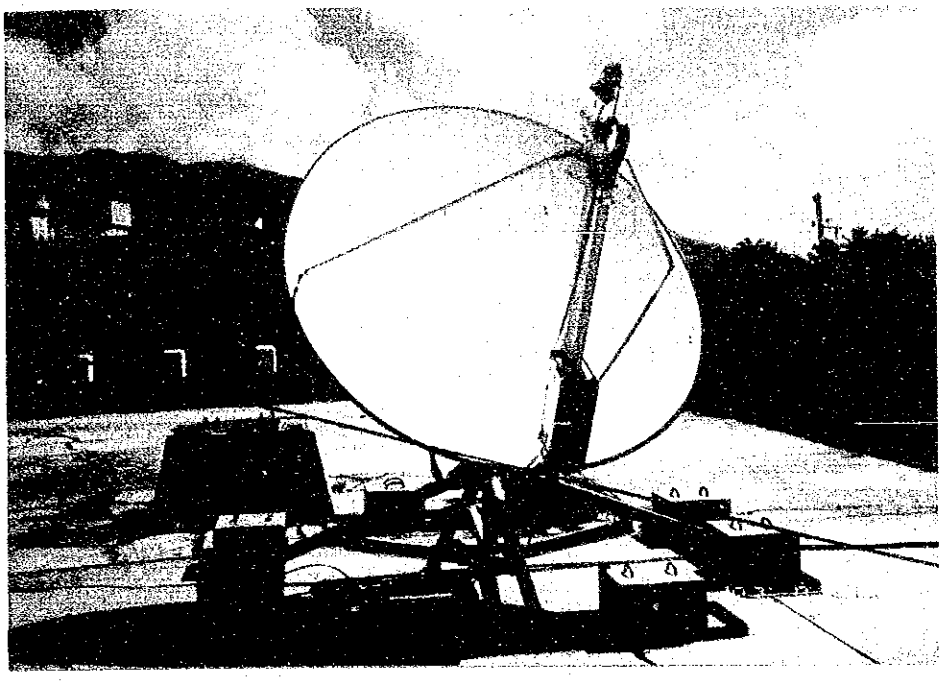


Example of Indoor Equipment at the Hub Station



Example of Indoor Unit(IDU)

Figure 4.6 (1/2) Examples of Equipment Appearance



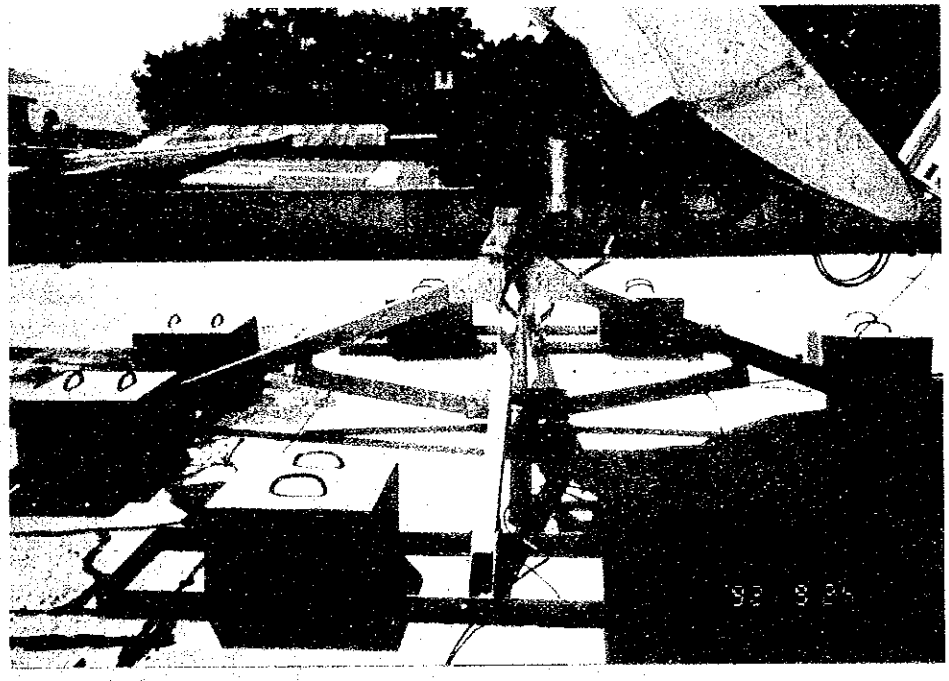


Figure 4.6 (2/2) Example of Equipment Appearance and Photos

(2) Switching Equipment

Switching equipment is of digital type and the main characteristics are shown in Table 4.3.

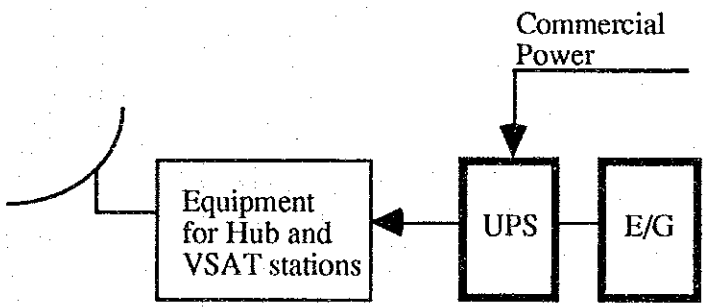
Table 4.3 Main Characteristics of Switching Equipment

	Main Parameter
Switching Method	Controller : Stored program control Speech Pass : PCM time-division
Line Capacity	100 lines
Interface with Radio Equipment	4W E&M
Structure	Stand-alone type

(3) Power Supply System

Stand-by engine generator (E/G) and Uninterrupted Power Supply (UPS) are to be installed as shown in Figure 4.7 according to the design policy mentioned in clause 4.1.

The output voltage of the equipment is 220V AC, 60 Hz.



Legend:

■ : Power Supply Equipment to be installed

Figure 4.7 Power Supply Equipment

(a) Hub station

A power supply system of the capacity stated below is to be applied, due to insufficient capacity of the existing power supply system.

- Main fuel tank capacity sufficient for 8 hours.
- UPS capacity of 10 minutes, to absorb commercial power fluctuation and to start the engine automatically.

(b) VSAT station

Considering portability and reliability requirements of the System the following capacity of power supply system is to be applied.

- An E/G fuel tank capacity for 2 hours. The E/G can be operated continuously by refueling.
- A UPS capacity with 10 minutes to absorb commercial power fluctuation and to start the engine by manual operation.

4.3.3 List of Required Facilities

The numbers of major equipment are indicated in Table 4.4 including spares and measuring equipment which are to be stored in the Hub station.

Table 4.4 List of Required Facilities

Equipment name	Region											
	Hub	1	2	3	4	5	6	7	8	11	NCR	Total
Hub station												
Radio Equipment	1											1
Antenna	1											1
Power Supply Equipment	1											1
PABX	1											1
VSAT station												
Equip. for 3CHs		1	1	1	1	1			1			6
Equip. for 2 CHs		4	3	3	3	2	1	1	3	1	4	25
Power Supply Equipment		5	4	4	4	3	1	1	4	1	4	31
Telephone set	2	6	5	5	5	4	1	1	5	1	10	45
Facsimile machine												
For Hub st.(set)	1											1
For VSAT st.(set)	1	5	4	4	4	3	1	1	4	1	4	32
Spares												
For Hub st.(set)	1											1
For VSAT st.(set)	3											3
Measuring Equipment												
Spectrum analyzer	1											1
RF/IF Power meter	1											1
Frequency Counter	1											1
Handheld multimeter	1											1
Level meter and audio OSC	1											1

Note: (i) Feeders are included in the Hub station antenna and VSAT station equipment columns.

(ii) Spares for Hub station include LNA, HPA, Frequency converter, MODEM, DAMA controller, PABX units.

(iii) Spares for VSAT station include ODU, IDU for 3 channels, UPS and coaxial cable between ODU and IDU.

4.3.4 Equipment Installation Plan

(1) Required Space for the System

The required installation space for the System, including antennas, is shown in Table 4.5.

Table 4.5 Required Installation Space

Item	Hub Station	VSAT Station
Antenna	$100m^2$ in case of 7.6m ϕ ANT	$9m^2$ in case of 1.8m ϕ ANT $16m^2$ in case of 2.4m ϕ ANT
Radio and PABX	$4m^2$ (mounted 15 telephone channels)	$1m^2$ (include IDU,TEL,FAX)
Power Supply System (E/G, UPS)	$20m^2$	$2m^2$
Storage space for Measuring Equipment, Spares, Carrying Case, etc.	$9m^2$	$4m^2$

(2) Installation Plan for the Hub Station Equipment

(a) Antenna Installation Space

In the TELOF office, where the NTP project is being carried out, the available ground space is insufficient, and so the installation of the Hub station antenna on the ground is impossible. Considering the above, and taking into account economic factors, it is better to install the Hub station antenna on the roof top of the new four-story building constructed by NTP project, as shown in ANNEX-6.

(b) Installation Space for Radio and PABX Equipment

As for the antenna installation mentioned above, it is more economical to install the radio & PABX equipment in the radio room on the fourth floor of the new building.

Radio and transmission equipment for the NTP project are planned to be installed in the radio room, so the installation of the equipment for the System is to be designed taking into consideration that equipment.

The floor layout of the fourth floor in the new TELOF building is indicated in ANNEX-6.

(c) Installation Space for Power Supply System

An Engine Generator (E/G) and Uninterrupted Power Supply equipment (UPS) are planned to be installed in the power supply room on the ground floor in the new TELOF building indicated in ANNEX-6.

As mentioned in item (b), installation of the equipment for the System is to be designed taking into consideration NTP equipment.

(3) Installation Method for VSAT Facilities

The installation method of VSAT facilities, including both antennas and indoor equipment, is decided considering the temporary nature of installation, and the necessity for relocation and transportation in the event of an emergency. A standardized design is applied, rather than utilizing site-tailored designs.

(a) Installation Method for Antenna

The typical installation methods for VSAT antennas are indicated in Figure 4.8. The TELOF buildings, such as the telephone office and message center, are generally of insufficient roof strength to bear the load of the VSAT antenna. Therefore, most VSAT antennas are installed on the ground.

(b) Installation Method for Indoor and Terminal Equipment

The equipment is of desk-top type and the places are shown in ANNEX-6.

(c) Transportability

Considering requirements for transportability and relocation of the VSAT antenna, the base is fixed by sandbags or concrete blocks.

In addition, the VSAT equipment is able to be disassembled, or is of modular design, to facilitate transportation.

(In case of strong wind, additional sandbags or concrete blocks are provided on the base, or the VSAT equipment is disassembled.)

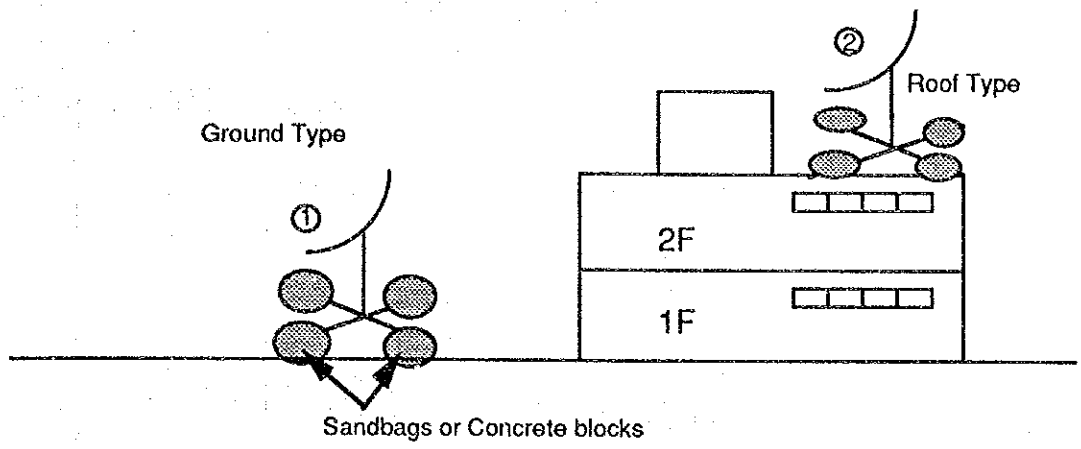


Figure 4.8 Antenna Mounting Method

(d) Maintenance and Security Conditions

While taking into account ease of maintenance and security conditions, the VSAT equipment is installed at points not readily visible, and is protected by fencing.

(4) Installation Site for Terminal Equipment

In principle, terminal equipment such as telephone sets and facsimile machines are installed at the same site as the VSAT equipment.

However, in the Hub station, some terminal equipment is installed at locations separate from the Hub station equipment, using a tie line. The sites for installation of terminal equipment are shown in Table 4.6.

Table 4.6 Installation Site for Terminal Equipment

	Installation Site	Terminal Equipment	
		Telephone	Facsimile
Metro Manila	1. TELOF	1	1
	2. National Disaster Coordinating Council	1	
	3. Department of Health	1	
	4. Department of Public Works and Highways	1	
	5. Department of Social Welfare and Development	1	
	6. Department of Interior and Local Government	1	
	7. Philippine National Red Cross	1	
Regional Centers	Same sites as VSAT equipment installed	2	1
Other VSAT Stations	Same sites as VSAT equipment installed	1	1

CHAPTER 5

IMPLEMENTATION PLAN

CHAPTER 5 IMPLEMENTATION PLAN

5.1 Construction Conditions

To execute the Project by a Japan's Grant Aid scheme, the following items are considered:

(1) In order to complete the Project in accordance with the implementation schedule, close contact between persons in the DOTC/TELOF and a consultant as well as a contractor, is necessary.

(2) For the implementation of the Project, a number of groups composed of Japanese and Philippine engineers are to be dispatched over the thirty - one (31) VSAT sites and one Hub station to ensure rapid progress of the construction work.

(3) Before starting the construction, information regarding transportation conditions to each site is to be collected.

5.2 Scope of Installation Work

5.2.1 Scope of Installation Work for the Japanese Side

The Japanese side provides facilities and equipment mentioned in Table 4.4 and perform the following installation works:

(1) At Hub Station
- Installation of antenna
- Installation and cabling for the radio system
- Installation and cabling for the PABX. (including a MDF)
- Installation and cabling for the power supply system
- Adjustment, testing and inspection of the System

(2) At VSAT Station
- Installation of antenna
- Installation and cabling for the radio and power supply equipment
- Installation of terminal equipment

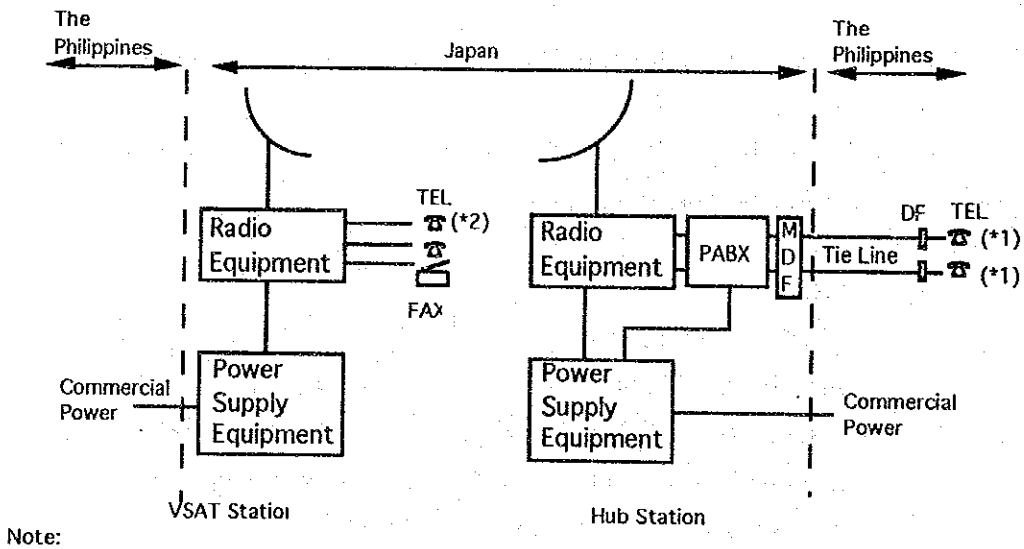
5.2.2 Scope of Installation Work for the Philippine Side

The Philippine side provides necessary cables and materials for the installation of the terminal equipment, if necessary, and performs the following installation works:

(1) At Hub Station and in Metro Manila
- To provide the tie lines between MDF of the Hub station and customer premises in Metro Manila (Estimated length of the tie lines is shown in Annex 6)
- Installation of terminal equipment in Metro Manila
- To provide commercial power to the distribution board in the Hub station.

(2) At VSAT Station
- To prepare land leveling for the construction of antenna and to fell trees where necessary.
- Construction of fences around the antenna or the site, where necessary.
- To provide commercial power to the site, where necessary.

The scope of installation work is shown below:



Note:
(*1):Terminal equipment is supplied by Japan.
(*2):VSAT stations accommodate 2 telephone circuits except VSAT station for Regional Centers

Figure 5.1 Scope of Installation Work

5.3 Implementation Management Plan

5.3.1 Implementation Management Policy

In preparing a construction management plan, a consultant takes into consideration the following:

(1) The consultant maintains close contact with both government agencies and persons concerned

(2) The consultant arranges necessary measures for smooth completion of construction by close contact with the contractor.

(3) The consultant supervises both the schedule of procurement of equipment and materials from Japan and the construction details.

5.3.2 Management Plan

The consultant is to carry out the following management tasks concerning the implementation of the Project.

(1) Detailed Design

On the basis of the basic design study, the consultant carries out detailed design with DOTC and TELOF personnel to finalize general conditions, special conditions and technical detailed specifications necessary for implementation of the Project. Depending on the result of the detailed design, the consultant prepares bidding documents.

(2) Construction Management

(a) Conducting Invitation to Bid to select contractor
The consultant carries out the invitation to bidders, acceptance and evaluation of the proposal, and assist DOTC and the Japanese contractor in concluding the agreement.

(b) Examination of Approval Drawings
The consultant, on behalf of DOTC, examines the production drawings of equipment and materials submitted by the contractor.

(c) Factory Inspection

Prior to the shipment of equipment and materials, the consultant verifies that the items conform to the contract documents at the supplier's factory .

(d) Construction Supervision

According to the terms of the agreement concluded between DOTC and the consultant, the latter sends engineers to the project sites as required to supervise construction work.

(e) Witness to Acceptance Tests

Upon completion of the construction work, DOTC and/or the consultant are to be present at the acceptance test to make a final verification of facilities introduced under the Project.

5.4 Procurement Plan of the Equipment and Materials

The equipment and materials shown in Table 4.4 are to be procured in Japan and shipped via Manila to each VSAT station.

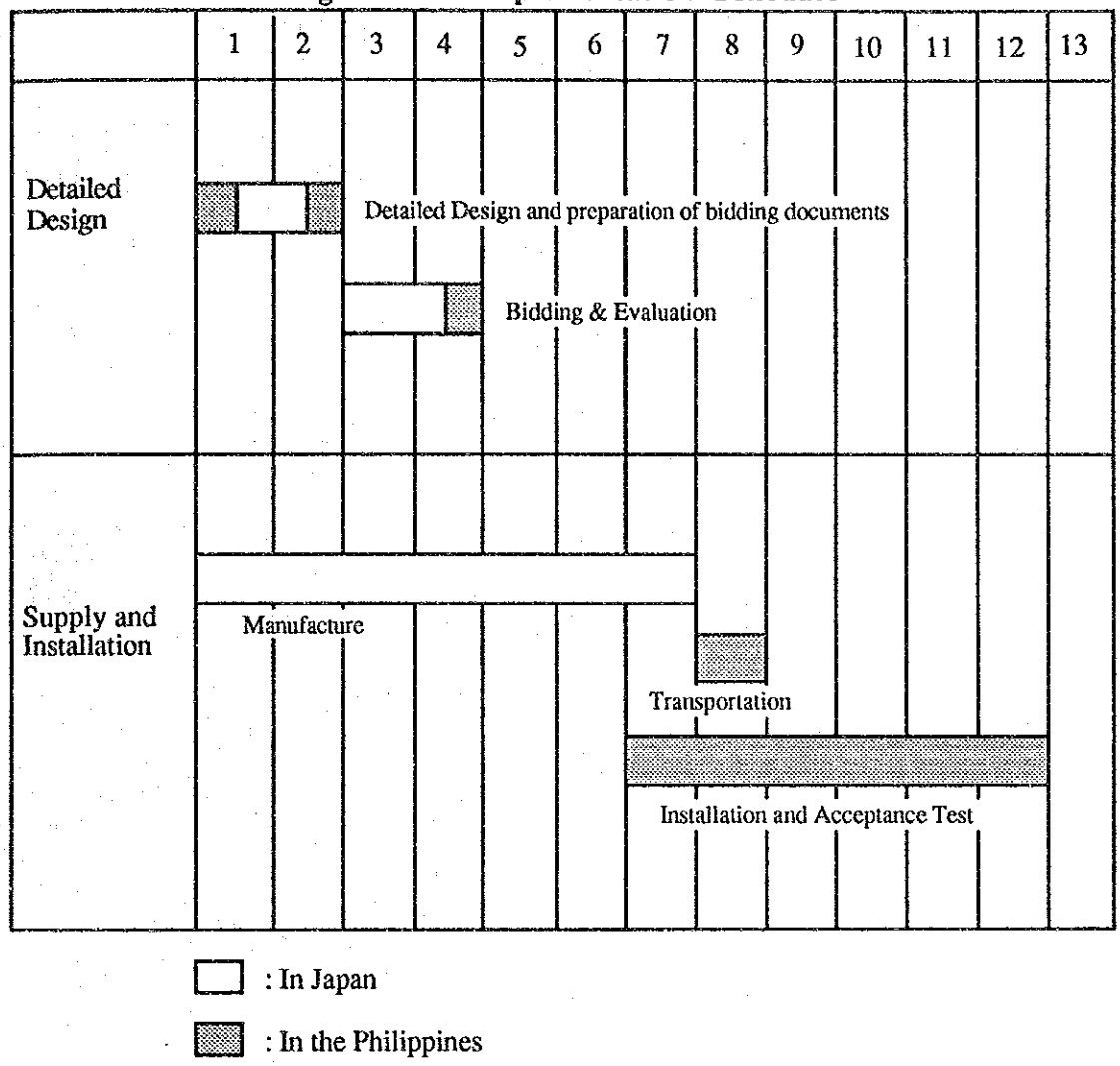
5.5 Implementation Schedule

An implementation schedule is shown in Figure 5.2.

5.6 Expenses to be borne by the Philippine Government

The expenses are estimated to be a sum of 3.05 million Pesos including materials and personnel expenses for the installation work mentioned in clause 5.2.2. The expenses breakdown is as shown in ANNEX 8.

Figure 5.2 Implementation Schedule



CHAPTER 6

PROJECT EVALUATION AND CONCLUSION

CHAPTER 6 PROJECT EVALUATION AND CONCLUSION

Disaster control is a major problem to be solved in the Philippines, which encounters large scale natural disasters such as typhoons, earthquakes, floods and so on every year. In particular, the increase in damage due to the delay of the disaster warning and relief activities, has reached critical levels. This Project is to establish an emergency telecommunications system to reduce delay in communications due to the insufficient telecommunications network, and to reduce property damage, injuries, and loss of human life, and to prevent the slowdown of social and economic activities. The following effects are expected to be yielded by the implementation of the Project.

Present situation	Measures taken in the Project	Effects of the Project
Difficult to communicate with disaster affected area due to the insufficient telecommunications network.	Telecommunication circuits to the related organizations in Metro Manila, etc. are established by installation of transportable VSAT stations at the disaster affected area.	By obtaining accurate information quickly from disaster affected areas, fast and efficient disaster operations such as relief and rehabilitation activities can be expected.
The possibility exists of losing contact with the outside world due to the interruption of communications by a disaster.	It is planned to install VSAT stations using the satellite in 27 cities which have suffered from natural disasters of frequent occurrence.	By always securing, the stable telecommunication circuits, the fear of isolation of some areas disappears. It is possible to suppress the damage and hardship caused by the lack or delay of communication.
Difficult to secure emergency communications of governmental organizations during a disaster period due to the congestion of public telecommunication circuits	The system is used exclusively by the governmental organizations.	By always securing the telecommunication circuits of the governmental organizations, necessary communication can be done quickly. The communications contribute much to the fast delivery of warning information and wide area disaster operations.

Furthermore, although large number of Philippine people will benefit from this Project, the Project itself can not be profitable because the System is used only for internal communications within the governmental organizations.

Considering the above, it is recommended that the Project be undertaken through Japan's Grant Aid Scheme.

To execute the Project more smoothly and effectively the following items are recommended.

(1) As mentioned in clause 3.4, it is desirable to improve the technical skill of the key personnel who will engage in the operation and maintenance of the System through the training in Japan.

(2) When disaster occurs, it is necessary to establish an emergency telecommunications circuit as quickly as possible to derive the highest benefit from the Project. Therefore, it is indispensable to prepare the operation manuals which describe action plans for when a disaster occurs and to establish a system quickly to carry out the smooth operations .

(3) It is difficult to forecast when disaster occurs. Therefore, it is necessary to plan and execute drill exercises to increase the competence if a disaster occurs.

(4) The stable use of the transponder must be kept to secure the necessary satellite communication channels.

(5) It is indispensable to take necessary budgetary measures for the implementation of the Project and the continuous utilization of the System.

(6) It is necessary to secure the tie lines for the related organizations in Metro Manila before the end of the construction work of the Project.

ANNEX

ANNEX

1. JICA Study Team Member
2. Study Schedule of Work in the Philippines
3. List of Interviewees
4. Minutes of Discussions
5. Result of Site Survey
6. Drawings of each Site
7. Data for System Design
8. Breakdown of the Expenses

ANNEX 1 JICA Study Team Member

(1) Basic Design Study

Name	Duty	Affiliated to
Takao YAMAZAKI	Team Leader	Telecommunications Development Specialist, , Japan International Cooperation Agency, Institute for International Cooperation
Takeshi HIROSE	Satellite Communication Plan	Frequency Planning Division, Telecommunications Bureau, Ministry of Posts and Telecommunications
Toshiyuki IWAMA	Coordination	Second Basic Design Study Division, Grant Aid Study & Design Department, Japan International Cooperation Agency
Seiki OGAWA	Network Planning	NTT International
Akira ITAGAKI	Transmission (A)	ditto
Ryutaro TOTSUKA	Transmission (B)	ditto
Tutomu SHIROMA	Transmission (C)	ditto
Kouji MIYOSHI	Switching & Power Plant	ditto
Hiroyuki TAKAKURA	Cable Facilities	ditto
Fumiaki MATSUYAMA	Equipment Design and Cost Estimation	ditto

(2) Draft Report Explanation

Name	Duty	Affiliated to
Takao YAMAZAKI	Team Leader	Telecommunications Development Specialist, , Japan International Cooperation Agency, Institute for International Cooperation
Takeshi HIROSE	Satellite Communication Plan	Frequency Planning Division, Telecommunications bureau, Ministry of Posts and Telecommunications
Sinya SUZUKI	Grant Aid	Grant Aid Division Economic Cooperation Bureau Ministry of Foreign Affairs
Seiki OGAWA	Network Planning	NTT International
Akira ITAGAKI	Transmission (A)	ditto

ANNEX 2 Study Schedule of Work in the Philippines

(1) Study Schedule of Work in the Philippines (Basic Design Study)

Date			Contents of Activity
24	Aug.	(Mon.)	Departure from Tokyo Courtesy call to Japanese Embassy, Meeting with JICA
25		(Tu.)	Courtesy call to DOTC and Meeting
26		(Wed.)	Meeting with DOTC and Site survey(TELOF)
27		(Th.)	Survey item and schedule arrangement with DOTC DOTC site survey
28		(Fri.)	Site survey(NTC, TELOF)
29		(Sat.)	Meeting with JICA experts
30		(Sun.)	Discussion among the team members Departure of Mr. Matsuyama
31		(Mon.)	Site survey(Maritime)
1	Sep..	(Tu.)	Meeting with DOTC, Data collection Departure of Mr. Totsuka, Mr.Takakura and Mr. Shiroma from Tokyo
2		(Wed.)	Preparation of the survey and site survey(Malacanang)
3		(Th.)	Site survey
4		(Fri.)	Site survey
5		(Sat.)	Site survey
6		(Sun.)	Site survey
7		(Mon.)	Site survey
8		(Tu.)	Site survey
9		(Wed.)	Site survey
10		(Th.)	Site survey
11		(Fri.)	Site survey
12		(Sat.)	Site survey
13		(Sun.)	Site survey
14		(Mon.)	Site survey
15		(Tu.)	Site survey
16		(Wed.)	Site survey
17		(Th.)	Site survey
18		(Fri.)	Site survey
19		(Sat.)	Site survey

20		(Sun.)	Site survey
21		(Mon.)	Site survey
22		(Tu.)	Site survey
23		(Wed.)	Site survey
24		(Th.)	Site survey
25		(Fri.)	Site survey
26		(Sat.)	Site survey
27		(Sun.)	Site survey
28		(Mon.)	Site survey
29		(Tu.)	Site survey
30		(Wed.)	Site survey
1	Oct.	(Th.)	Officials Departure from Tokyo, Meeting with JICA
2		(Fri.)	Meeting with DOTC
3		(Sat.)	Site survey(Batangas)
			Departure of Mr.Totsuka, Mr.Takakura and Mr.Siroma from Manila
4		(Sun.)	Discussion among the team members
5		(Mon.)	Meeting with DOTC,
			Courtesy call to DOTC under secretary
6		(Tu.)	Meeting with DOTC on Minutes of Discussion and signing of the
			Minutes, Report to Japanese Embassy
7		(Wed.)	Report to JICA, Courtesy call to DOTC secretary
8		(Th.)	Japanese officials departure from Manila
			Data analysis
9		(Fri.)	Data collection and analysis
10		(Sat.)	Discussion among the team members
11		(Sun.)	Data arrangement
12		(Mon.)	Data collection and arrangement
13		(Tu.)	Arrival in Tokyo

(2) Study Schedule of Work in the Philippines (Site Survey)

Date			Team-A	Team-B	Team-C	Team-D
3	Sep.	(Th.)	Lucena	Lucena	Legaspi	Legaspi
4		(Fri.)	Batangas	Batangas	ditto	ditto
5		(Sat)	Data analysis, discussion among the team members			
6		(Sun.)	Data analysis, preparation of survey			
7		(Mon.)	Cabanatuan	Cabanatuan	Boac	Data collect.
8		(Tu.)	Ilagan	Bayombong	ditto	ditto
9		(Wed.)	Aparri	Aparri	Data analysis	Tacloban.
10		(Th.)	Tuguegarao	Move	Iloilo	ditto
11		(Fri.)	Vigan	Laoag	ditto	Data analysis
12		(Sat.)	San.Fernando		Data analysis	ditto
13		(Sun.)	Move	Move	discussion within groups	
14		(Mon.)	Baguio	Baguio	Zamboanga	Data collect.
15		(Tu.)	Lingayen	Lingayen	ditto	Cag. De Oro
16		(Wed.)	Iba	Iba	Data analysis	ditto
17		(Th.)	Tarlac	Malolos	Tagbilaran	Kalibo
18		(Fri.)	TTI	TTI	ditto	ditto
19		(Sat.)	Discussion among the team members			
20		(Sun.)	Data analysis			
21		(Mon.)	Data collection			Calapan
22		(Tu.)	Davao	Cebu	Data analysis	ditto
23		(Wed.)	ditto	ditto	ditto	ditto
24		(Th.)	Virac	Pagadian	Naga	Bacolod
25		(Fri.)	ditto	ditto	ditto	ditto
26		(Sat.)	Data analysis			
27		(Sun.)	Meeting among the team members			
28		(Mon.)	Data collect.	G.Santos	Cotabato	Data collect.
29		(Tu.)	ditto	ditto	ditto	ditto
30		(Wed.)	ditto	Surigao	Dumaguete	ditto
1	Oct.	(Th.)	ditto	ditto	ditto	ditto
2		(Fri.)	Meeting with DOTC			ditto

(3) Study Schedule of Work in the Philippines (Explanation of Draft Report)

Date			Contents of Activity
4	Feb.	(Th.)	Departure from Tokyo
			Courtesy call to Japanese Embassy, Meeting with JICA
5		(Fri.)	Courtesy call to DOTC and Meeting
			(Explanation of Draft Report and Discussion with DOTC)
6		(Sat.)	Discussion among the team members
7		(Sun.)	Discussion among the team members
			Mr. Suzuki : Departure from Tokyo
8		(Mon.)	Meeting with DOTC
			(Explanation of Draft Report and Discussion with DOTC)
9		(Tu.)	Meeting with DOTC
			(Concerning Draft Contract of Transponder Lease)
10		(Wed.)	Preparation of Minutes of Meeting
11		(Th.)	Signing of Minutes of Meeting
			Site Survey (Hub station, DOTC, TTI)
12		(Fri.)	Report to Japanese Embassy and JICA
13		(Sat.)	Arrival in Tokyo

ANNEX 3 List of Interviewees

The Japanese Embassy

The First Secretary	Akira Koyama

JICA Philippine Office

Resident Representative	Masataka Iijima
Staff	Naoya Shimizu
Staff	Kenji Matumoto
JICA Telecom Expert	Yoshiaki Shioda
	Keiichi Yago
	Sadayoshi Tojo
	Hideo Hashimoto

National Economic and Development Authority

Sr. Economic Development Specialist	Mr.Rodel C. Villa
Economic Development Specialist	Mr.Kenneth V. Tantac

Department of Transportation and Communications

Undersecretary	Ms. Josefina T. Lichauco
Chief, Telecom Planning Division	Ms. Mercedes F. Garcia
Supervising Communications Development Officer	Mr.Manuel L. Imperial
Supervising Communications Development Officer	Mr. Cyril R. Avila
Communications Development Officer	Mr. Jose S. Tanqueco, Jr.
Communications Development Officer	Mr. Patricio V. Butay
Chief Legal Officer	Mr. Graciano L. Sitchon
DOTC Action Center , Traffic Man. Officer	Mr. Vicente N. Reyes
Head Telecom Engineer	Mr. Clodualdo N. Rodil
Municipal Telephone Office, Project Engineer	Mr. Faustino S. Pulido
Office of the Secretary , Executive Assistant	Mr. Antolin C. Alonte

Office of the Secretary , Executive Assistant
Mr. Isaac Belmonte
Office of the Secretary , Executive Assistant
Mr. Jesus F. Ibay
Office of the Secretary , Executive Assistant
Mr. Provenir Porcincula

National Telecommunications Commission

Engineer II — Mr. Romualdo L. Cervantes
Chief, Fixed/Land Mobil Service Division
Mr. Danilo Orence Cuenca
Chief, Telecommunications, Planing & Development Dept.
Ms. Sylvia I. Marcelo
Supervising Communications Development Officer
Mr. Albert F. Acosta

Telecommunications Office

Assistant Secretary
Mr. Pacifico F. Maghacot, Jr.
Assistant Project Manager, NTP I - 1
Mr. Eulogio H. Aguila
Assistant Project Manager, NTP I - 2
Mr. Buenaventra G. Garcia
Assistant Project Manager, NTP I - 3
Mr. Santiagiago O. Testor
Development Officer Engineer — Mr. Nestor S. Bongato
Engineer — Mr. Georgben Torralba
Mr. Joselito G. Lacson
Mr. Constantino D. Bravo
(Region 1) — Regional Director
Mr. Rosemawe C. Viclanueva
(Region 2) — District Manager
Mr. Pablito N.Dela
(Region 3) — Engineer III
Mr. Juanto G. Rey
(Region 4) — Chief Operator
Mr. Resurrecion D. Vilches
(Region 4) — Acting Chief Operator
Mr. Celso V. Pascual

(Region 5)	Regional Director
	Mr. Acbert T. Vovero
(Region 6)	Regional Director
	Mr. David N. Tabar
(Region 7)	Engineer
	Mr. Federico Cabioc
(Region 8)	Chief Operator
	Mr. Pacifico G. Buac
(Region 9)	Regional Director
	Mr. Vcente B. Patangan
(Region 10)	Regional Director
	Mr. Ponilo Sta. Cruz
(Region 11)	Engineer
	Mr. Eli Zambra
(Region 12)	Engineer II

Telecommunications Training Institute

Chief	Mr. Guido C. Agon

Office of Civil Defense Department of National Defense

Administrator	Mr. Fortunato M. Dejoras, ceso III

Philippine Long Distance Telephone Company

Mr. Arnaldo S. Allado

ANNEX 4

MINUTES OF DISCUSSIONS

OF

THE BASIC DESIGN STUDY ON THE PROJECT FOR

THE ESTABLISHMENT OF EMERGENCY TELECOMMUNICATIONS SYSTEM

IN

THE REPUBLIC OF THE PHILIPPINES

In response to a request from the Government of the Republic of the Philippines, the Government of Japan decided to conduct a Basic Design Study on the Project for the Establishment of Emergency Telecommunications System in the Republic of the Philippines (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency(JICA).

JICA sent to the Philippines a study team, which is headed by Mr. Takao Yamazaki, Telecommunications Development Specialist, JICA, and is scheduled to stay in the country from August 24 to October 13, 1992.

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

In the course of the discussions and field survey, both parties have confirmed the main items described on the attached sheets. Based on this Minutes of Discussions the team will proceed to further works and prepare the Basic Design Report.

Manila, October 6, 1992

TAKAO YAMAZAKI
Leader
Basic Design Study Team
Japan International
Cooperation Agency

JOSEFINA T. LICHAUCO
Undersecretary for
Communications
Department of Transportation
& Communications
The Republic of the Philippines

ATTACHMENT

1. Objective of the Project

The objective of the Project is to establish a part of a comprehensive nationwide emergency telecommunications network which is easily expandable in the future so that the Government of the Philippines can take prompt action to deal with natural disasters.

2. Executing Agency

Department of Transportation and Communications (DOTC) is responsible for the implementation and administration of the Project.

Telecommunications Office (TELOF) is responsible for the operation and maintenance of the Project.

3. User of the Project

User of the Project shall be restricted to the Governmental organization.

It shall not be used for the military purpose.

4. Services to be provided by the Project

Services to be provided by the Project are telephone and facsimile.

5. Satellite

A portion of a transponder of Indonesian communication satellite PALAPA will be used exclusively for the Project.

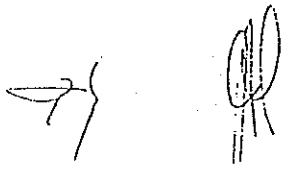
Concerning the lease of a portion of the transponder for the Project, DOTC has promised to submit a draft contract and to notice the agency to be appointed to the Government of Japan by the end of November, 1992.

6. Project site

6.1 Hub station

6.1.1 Project site of the hub station

The project site of the hub station is in the premises of TELOF in Metro Manila.



6.1.2 Location of terminal equipment

The locations of terminal equipment which is connected directly to the hub station with the tie line are as follows:

- TELOF
- Department of Health
- Department of Public Works and Highway
- Department of Social Welfare and Development
- Red cross
- Department of Interior and Local Government
- National Disaster Coordinating Council

6.2 VSAT station

The Project sites of the VSAT station are indicated in Annex I.

DOTC strongly requested for inclusion of the six (6) Regional Centers (Cebu, Iloilo, Zamboanga, Davao, Cagayan de Oro and Cotabato).

The team stated to convey the request of three (3) Regional Centers (Cebu, Iloilo, Davao) to the Authorities in Japan for consideration.

7. Outlines of the Project

7.1 System configuration

Overall system configuration is shown in Annex II.

Six (6) VSAT stations installed in the Regional Center shown in Annex I, will accommodate three (3) voice grade channels. Two (2) of them will be used for telephone service and the rest will be used for facsimile service. DOTC stated that one (1) channel for telephone service will be extended from the VSAT station to a local Disaster Coordinating Council.

Other VSAT stations will have two (2) voice grade channels. One (1) of them will be used for telephone service and another channel will be used for facsimile service

7.2 Project description

(1) Installation of a hub station

- Antenna system
- Radio system
- PABX system
- Power supply system
- Spare parts
- Measuring instruments and tools

(2) Installation of VSAT stations

- Antenna system
- Outdoor and indoor unit
- Un-interrupted power supply
- Engine-generator
- Terminal Equipment (Telephone and Facsimile)

8. Japan's Grant Aid system

The Government of the Philippines has understood the system of Japan's Grant Aid explained by the team.

The Government of the Philippines will take the necessary measures, described in Annex III for smooth implementation of the Project, on condition that the Grant Aid Assistance by the Government of Japan is extended to the Project.

9. Schedule of the Study

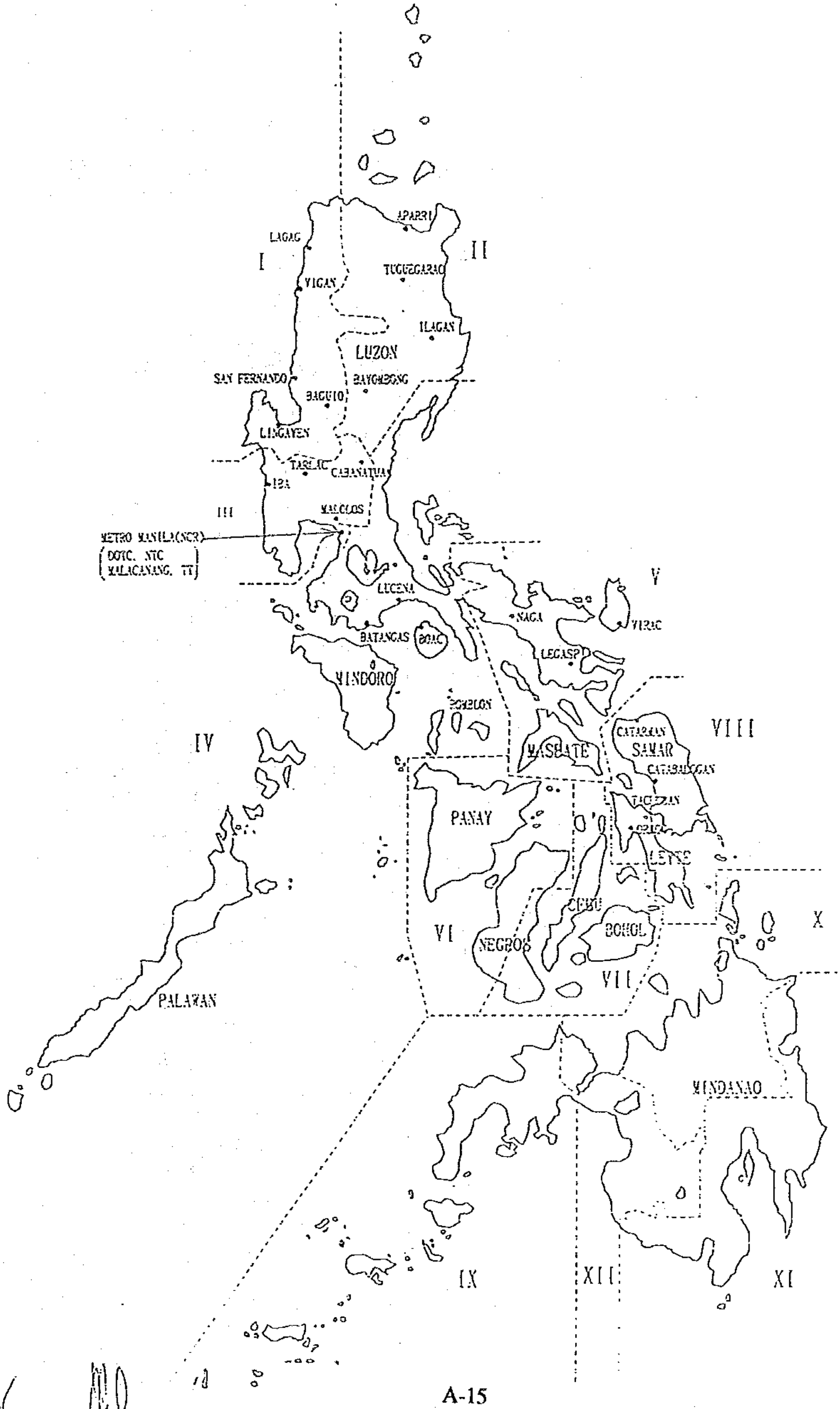
The Consultant will proceed to further studies in the Philippines until October 13, 1992.

Based on the Minutes of Discussions and technical examination of the study results, JICA will complete the draft final report and explain it to the Government of the Philippines after DOTC has submitted the draft contract.

Annex I

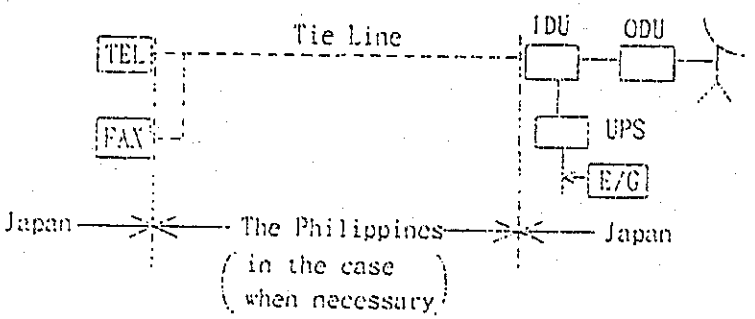
Location	Region	Site
Metro Manila	NCR	Department of Transportation and Communications
Metro Manila	NCR	National Telecommunications Commission
Metro Manila	NCR	Presidential Communication Unit, Malacanang
Metro Manila	NCR	Telecommunications Training Institute
Baguio	I	TELOF Message Center
Laoag	I	TELOF Telephone & Message Center
Lingayen	I	TELOF Telephone & Message Center
San Fernando*	I	TELOF Regional & Telex Switching Center
Vigan	I	TELOF Message Center
Tuguegarao*	II	TELOF Regional, Telephone & Message Center
Aparri	II	TELOF Message Center
Ilagan	II	TELOF Message Center
Bayombong	II	TELOF Message Center
Malolos*	III	TELOF Regional & Message Center
Iba	III	TELOF Telephone & Message Center
Tarlac	III	TELOF Massage Center
Cabanatuan	III	TELOF Telephone & Message Center
Batangas*	IV	TELOF Regional Center
Boac	IV	TELOF Telephone Center
Lucena	IV	TELOF Message Center
Romblon	IV	Decided by D/F report
Legaspi*	V	TELOF Regional & Message Center
Virac	V	TELOF Telephone & Message Center
Naga	V	TELOF Message Center
Tacloban*	VIII	TELOF Relay Station
Catarman	VIII	TELOF Telephone & Message Center
Ormoc	VIII	TELOF Message Center
Catabalogan	VIII	TELOF Telephone & Massage Center

Note * shows the Regional Center

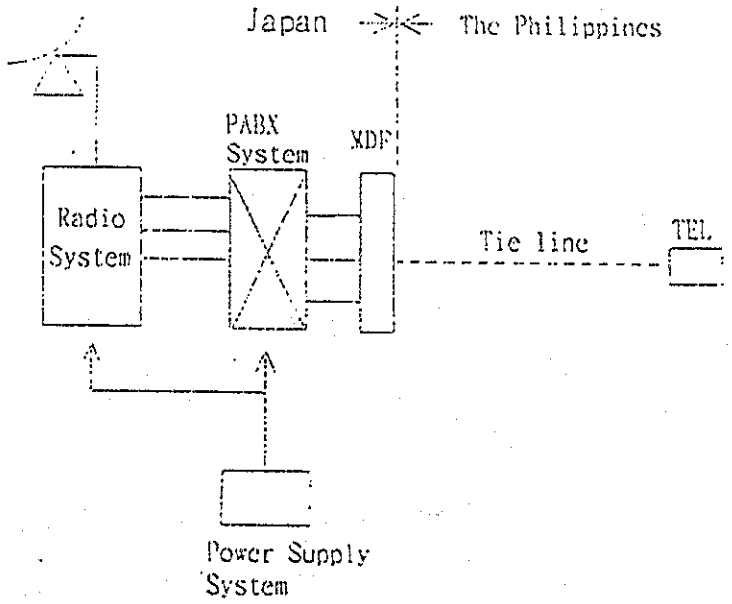

APARRI
LAGAG
I
II
VIGAN
TUGUEGARAO
ILAGAN
LUZON
SAN FERNANDO
BAYOMBONG
BAGUIO
LINGAYEN
TARLAC
CABANATUAN
IBA
III
MALOLOS
METRO MANILA(NCR)
LUCENA
V
NAGA
VIRAC
BATANGAS
BOAC
LEGASPI
MINDORO
ROMBLON
VIII
IV
CATARMAN
SAMAR
MASBATE
CATBALOGAN
PANAY
TACLOBAN
LEYTE
X
CEBU
VI
BOHOL
NEGROS
VII
PALAWAN
MINDANAO
IX
XII
XI

Annex II

System Configuraton of Emergency Telecommunications System



VSAT Station



Hub Station

Legend

TEL : Telephone FAX : Facsimile IDU : Indoor Unit
ODU : Outdoor Unit UIS : Un-interrupted Power Supply
E/G : Engine-generator MDF : Main Distribution Frame

Annex III

Necessary measures to be taken by the Government of the Philippines in case Japan's Aid is executed

1. To provide and secure the site for the Project.

2. To remove the existing unnecessary obstructions to the execution of the Project and to level the ground in the Project sites.

3. To Provide facilities for distribution of electricity and other incidental facilities to the Project site.

4. To bear commissions to the Japanese foreign exchange bank for the banking service based upon the Banking Arrangement.

5. To exempt taxes and to take necessary measures for customs clearance of the materials and equipment brought for the Project at the port of disembarkation.

6. To accord Japanese Nationals whose services may be required in connection with the supply of products and the services under the verified contract such facilities as may be necessary for their entry into the Philippines and stay therein for the performance of their work.

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

8. To maintain and use properly and effectively the facilities constructed and equipment purchased under the Grant.

9. To bear all the expenses other than those to be borne by the Grant, necessary for the execution of the Project.

10. To secure frequency assignments and other required permits and licenses.

11. To install the necessary facilities as indicated in Annex II.

MINUTES OF DISCUSSIONS

BASIC DESIGN STUDY ON THE PROJECT FOR
THE ESTABLISHMENT OF EMERGENCY TELECOMMUNICATIONS SYSTEM
IN
THE REPUBLIC OF THE PHILIPPINES
(CONSULTATION ON DRAFT REPORT)

In August, 1992, the Japan International Cooperation Agency (JICA) dispatched a Basic Design Study Team on the project for the Establishment of Emergency Telecommunications System (hereinafter referred to as "the Project") to the Republic of the Philippines, and through discussions, field survey, and technical examination of the results in Japan, has prepared the draft report of the study.

In order to explain and to consult the Republic of the Philippines on the components of the draft report, JICA sent to the Philippines a study team (the Team), which is headed by Mr. Takao Yamazaki, Telecommunications Development Specialist, JICA, and is scheduled to stay in the country from February 4 to February 13, 1993.

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

Manila, February 11, 1993

TAKAO YAMAZAKI
Leader
Basic Design Study Team
Japan International
Cooperation Agency

JOSEFINA T. LICHAUCO
Undersecretary for
Communications
Department of Transportation
& Communications
The Republic of the Philippines

ATTACHMENT

(1) Components of draft report

The Government of the Republic of the Philippines has agreed and accepted in principle the components of the draft report proposed by the Team.

Major discussions are as follows:

(a) The Department of Transportation and Communications (DOTC) sent a letter dated 27 January 1993 to JICA Philippines Office regarding the Project. The Team explained its views on each of the items DOTC suggested in the letter. DOTC accepted the Team's views.

The Team also submitted suggestions concerning the draft agreement for the transponder lease to DOTC, and explained the reason for each suggestion. DOTC agreed to review the suggestions and give its comments to JICA Philippines Office by the end of March, 1993.

(b) DOTC and the Telecommunications Office (TELOF) are reconfirmed to be the organizations responsible for the implementation of the Project, and the operation and maintenance of the system.

(c) The Government of the Philippines agreed to secure the necessary budget for the implementation of the Project, and the operation and maintenance of the system, including the lease of 1/8th bandwidth of a transponder on a PALAPA satellite.

DOTC requested the Team to review the local expenses given in the draft report and the Team agreed to review the local expenses in terms of fencing, land leveling, etc.

(d) DOTC/TELOF agreed to assign the necessary staff by the beginning of the Project.

(e) DOTC/TELOF agreed to establish the organization for the operation and maintenance of the system before the end of the Project.

(f) DOTC/TELOF agreed to provide the necessary transport to move the VSAT facilities to disaster areas.

(g) DOTC requested the Team to add in the system a function for automatic sequential information delivery from the Hub station by a facsimile machine. The Team agreed to convey DOTC's request to the authorities concerned in Japan.

(h) The Team recommended the installation positions of the Hub station facilities be as shown in the draft report in order to avoid performance degradation of the system. DOTC accepted the recommendation and agreed to reserve those installation positions.

(2) Japan's Grant Aid system

(a) The Government of the Philippines has understood the system of Japanese Grant Aid explained by the Team.

(b) The Government of the Philippines will take the necessary measures, described in Annex, for smooth implementation of the Project on condition that the Grant Aid assistance by the Government of Japan is extended to the Project.

(3) Further schedule

The Team will make the final report in accordance with the confirmed items, and send it to the Government of the Philippines by the end of May, 1993.

Annex

Necessary measures to be taken by the Government of the Philippines in case Japan's Aid is executed:

1. To provide and secure 1/8th bandwidth of a transponder on a PALAPA satellite, on which International Coordination has been completed, by the commencement of the installation work of the Hub station.
2. To provide and secure the sites for the Project.
3. To remove the existing unnecessary obstructions to the execution of the Project and to level the ground in the Project sites.
4. To provide facilities for distribution of electricity and other incidental facilities to the Project sites.
5. To bear commissions to the Japanese foreign exchange bank for the banking service based upon the Banking Arrangement.
6. To exempt taxes and to take necessary measures for customs clearance of the materials and equipment brought for the Project at the port of disembarkation.
7. 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 Philippines and stay therein for the performance of their work.
8. To exempt Japanese Nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the Philippines with respect to the supply of the products and services under the verified contracts.
9. To maintain and use properly and effectively the facilities constructed and equipment purchased under the Grant.
10. To bear all the expenses other than those to be borne by the Grant, necessary for the execution of the Project.
11. To secure frequency assignments and other required permits and licenses.
12. To perform the installation work shown in Figure 5.1 of the draft report.

ANNEX 5 Result of Site Survey(1/2)

Region	Location	Selection	Survey	Site	Attendan	Antenna	Terminal: Terminal	Terminal: LDCC	Modification: Area Exp	Modification: Leveling	Modification: Cut Tree	Modification: Fence	Modification: Building	Power: Type	Power: Failure	Telecomm.: No. of Te	Telecomm.: HF	Telecomm.: VHF	Telecomm.: UHF	Telecomm.: Other	Remarks
	TELOF	●	●	TELOF	●	R	–	–						220V,3P	Δ	2			●	Micro	for Hub
	Maritime		●	Maritime	●	G	–	–						220V,3P	Δ		●	●			for Hub
NCR	DOTC	●	●	DOTC	●	R	●							220V,1P	Δ	●		●	●		
	NTC	●	●	NTC	●	R	●							220V,1P	Δ	●		●	●		
	Malacanang	●	●	Presidential Communication Unit	●	G	●					●		220V,1P	Δ	●			●		
	TTI	●	●	TTI(Telecommunications Training Institute)	●	R	●							220V,3P	Δ	●					for training
	Baguio	●	●	Regional & Message Center	●	G	●			●		Δ		220V,1P	●	1	●		●		
	Laoag	●	●	Telephone & Message Center	●	G	●			●		Δ		220V,3P	Δ	15	●				
1	Lingayen	●	●	Telephone & Message Center	●	G	●			●		●		220V,3P	x	1					
	S.Fernando	●	●	Telex Switching & District	●	G	●	RDCC(0.3Km)		●		Δ		220V,3P	x	1			●		
	Vigan	●	●	Message Center	Δ	G	●			●	●	Δ		220V,1P	●	1	●				
	Tuguegarao	●	●	TELOF Regional, Telephone & Message	●	R	●	RDCC						220V,3P	Δ	1	●				
	Aparri	●	Δ	TELOF Message Center	Δ	G	●			●	●	Δ		220V,1P	x	0	●				
2	Ilagan	●	●	TELOF Message Center	Δ	G	●			●		●		220V,1P	x	1	●				
	Batanes(Basco)																				
	Bayombong	●	●	TELOF Meassage Center	Δ	G	●			●		●		220V,1P	Δ	2	●				
	Malolos	●	●	TELOF Regional & Message Center	●	G	●	PDCC		●	●	●		220V,1P	●	1	●				
	Iba	●	●	TELOF Telephone & Message Center	●	G	●		●	●		●		220V,3P	Δ	1	●			VSAT	
3	Tarlac	●	●	TELOF Message Center	Δ	G	●			●	●	●		220V,1P	Δ	1	●				
	Cabanatuan	●	●	TELOF Telephone & Message Center	●	G	●			●		Δ		220V,1P	Δ	0	●				
	Batangas	●	●	TELOF Regional Office	●	G	●	RDCC(50m)		●		Δ		220V,1P	Δ	1	●		●	SRT500	
	Infanta																				
	Boac	●	●	TELOF Telephone Office	Δ	G	●			●		●		220V,3P	x	0		●	●		
4a	Baler																				
	Lucena	●	●	TELOF Message Center	Δ	G	●			●		Δ		220V,1P	x	0	●				
	Romblon	●	Δ	TELOF Message Center	Δ	G	●			●		Δ		220V,1P	Δ	0	●				
	P.Princesa		Δ	TELOF Message Center	Δ	G	●			●		●		220V,3P	●	0	●				
4b	Mamburao																				
	Calapan		●	TELOF Message Center	Δ	R	●			●		●		220V,1P	x	0	●			VSAT	
	Legaspi	●	●	TELOF Regional & Message Center	Δ	G	●	RDCC(0.2Km)	●	●		●		220V,3P	Δ	2	●				
	Virac	●	●	TELOF Telephone & Message Center	●	R	●							220V,3P	●	4	●			VSAT	
	Naga	●	●	TELOF Message Center	Δ	G	●			●		●		220V,1P	x	1	●				
5	Masbate																				

Region	Location	Selection	Survey	Site	Attendan	Terminal			Modification					Power		Telecomm.					Remarks
						Antenna	Terminal	LDCC	Area Exp	Leveling	Cut Tree	Fence	Building	Type	Failure	No. of Te	HF	VHF	UHF	Other	
5	Daet		△	TELOF Message Center	●	R	●			●		●	●	220V,1P	x	0	●				
6	Irosin		△	TELOF Message Center	△	G	●			●		●		220V,1P	△	0	●				
	Iloilo	●	●	TELOF Regional Office	●	G	●			●		●		220V,1P	●	2	●				
	Kalibo		●	TELOF Message Center	●	G	●			●		●		220V,1P	●	5	●				
	Bacolod		●	TELOF Message Center	△	R	●			●		●		220V,1P	△	1	●	●		ANTRC	
	San Jose																				
7	Cebu	●	●	TELOF Regional Office	●	G	●					●		220V,3P	△	1	●				
	Dumaguete		●	TELOF Message Center	△	G	●			●		●		220V,1P	●		●				
	Tagbilaran		●	TELOF Message Center	●	G	●			●		●		220V,3P	●	2	●				
	Siquijor																				
8	Tacloban	●	●	TELOF Relay Station	●	G	Regional	RDCC(10Km)		●		●		220V,3P	x	1?	●				
	Maasin		△	TELOF Telephone & Message	●	G	●			●		●		220V,1P	△	3	●				
	Catarman	●	△	TELOF Telephone & Message	●	G	●			●		●		220V,1P	x	4	●				
	Ormoc	●	△	TELOF Message Center	●	G	●			●		●		220V,1P	●	0	●				
	Borongan		△	TELOF Telephone & Message	●	G	●			●		●		220V,1P	x	1	●				
	Catbalogan	●	△	TELOF Telephone & Message	●	G	●			●		●		220V,1P	x	5	●				
9	Zamboanga		●	TELOF Regional & Message Center	●	R	●			●		●	●	220V,1P	△	2	●				
	Jolo																				
	Pagadian		●	TELOF Message Center	△		●			●		●		220V,3P	△	0	●				
10	Cag. de Oro		●	TELOF District Office	●	G	Regional			●		●		220V,1P	x	0	●				
	Oroquieta																				
	Surigao		●	TELOF Message Center	●	G	●			●		●		220V,1P	x	1	●				
11	Davao	●	●	TELOF Regional Office	●	G	●			●	●	●		220V,1P	●	2	●				
	Mati																				
12	Cotabato		●	TELOF Regional Office	●	G	●			●		●		220V,1P	●	2	●				
	Gen. Santos		●	TELOF Message Center	△	G	●			●		●		220V,1P	x	1	●				

Survey ●:finished, △:finished by the Philippines

Attendant : ●:24hours, △:daytime

Antenna: R:installed on roof G:installed on ground

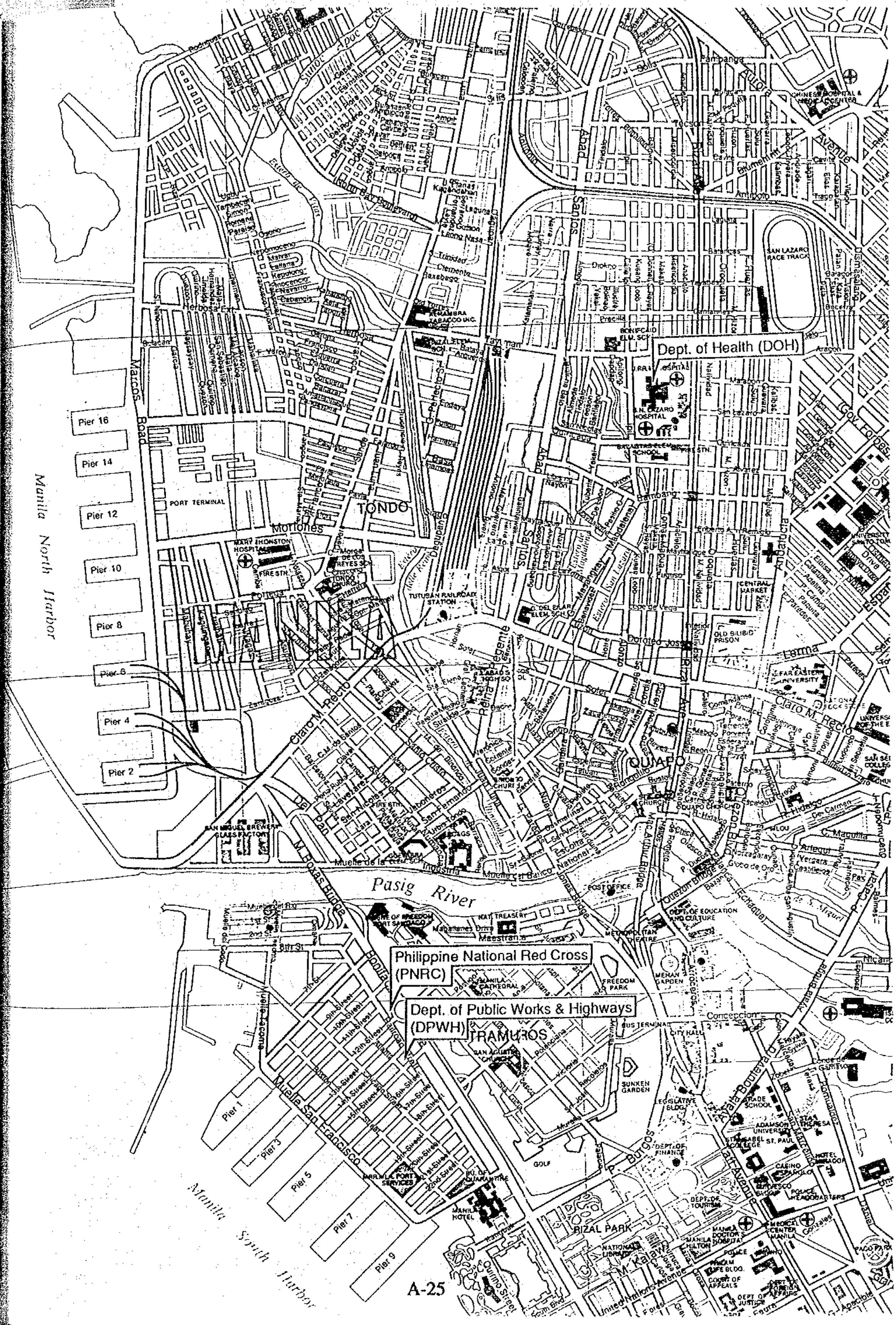
Terminal ● :within same location

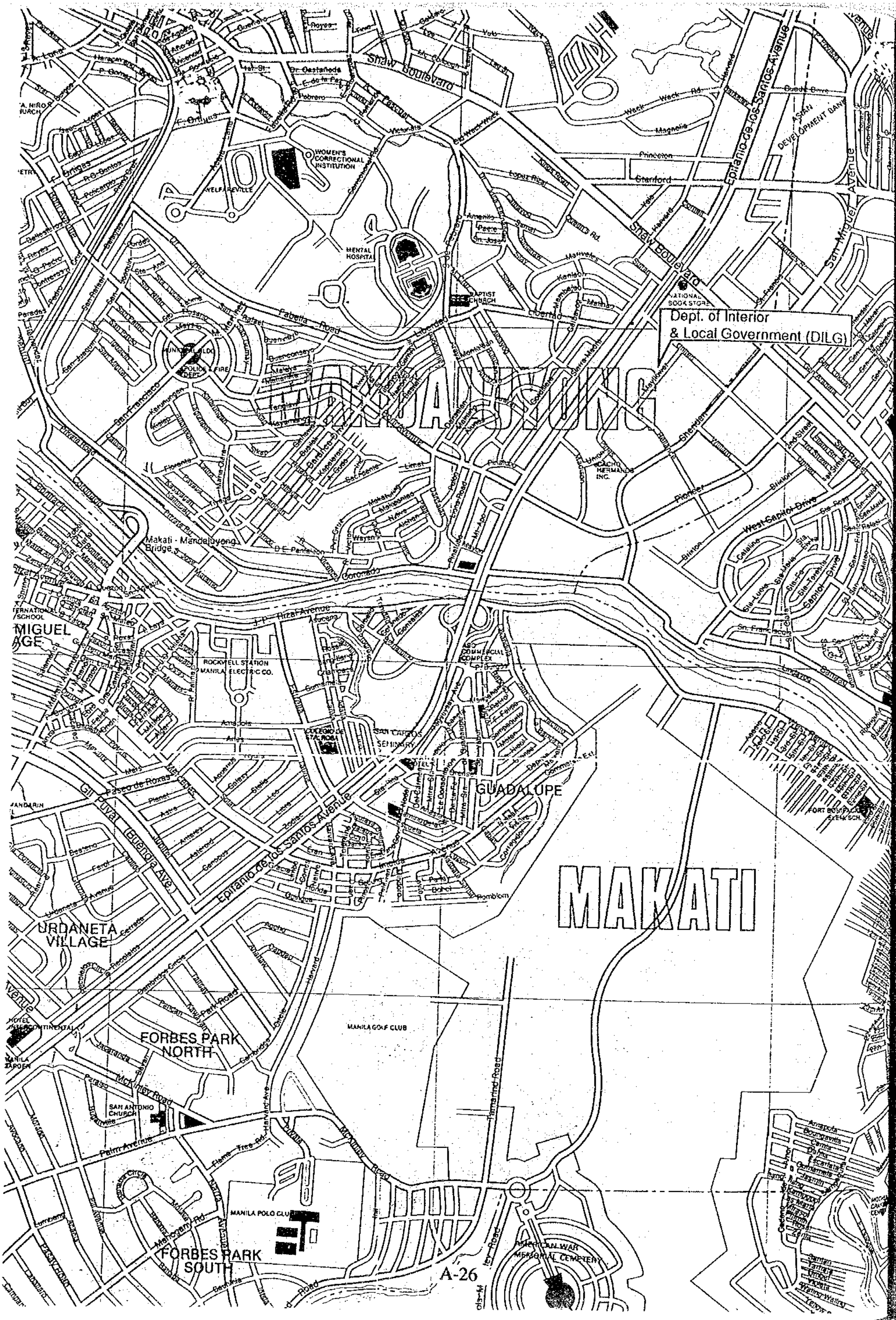
Faillure : ●:monthly, △:almost weekly, X :almost daily

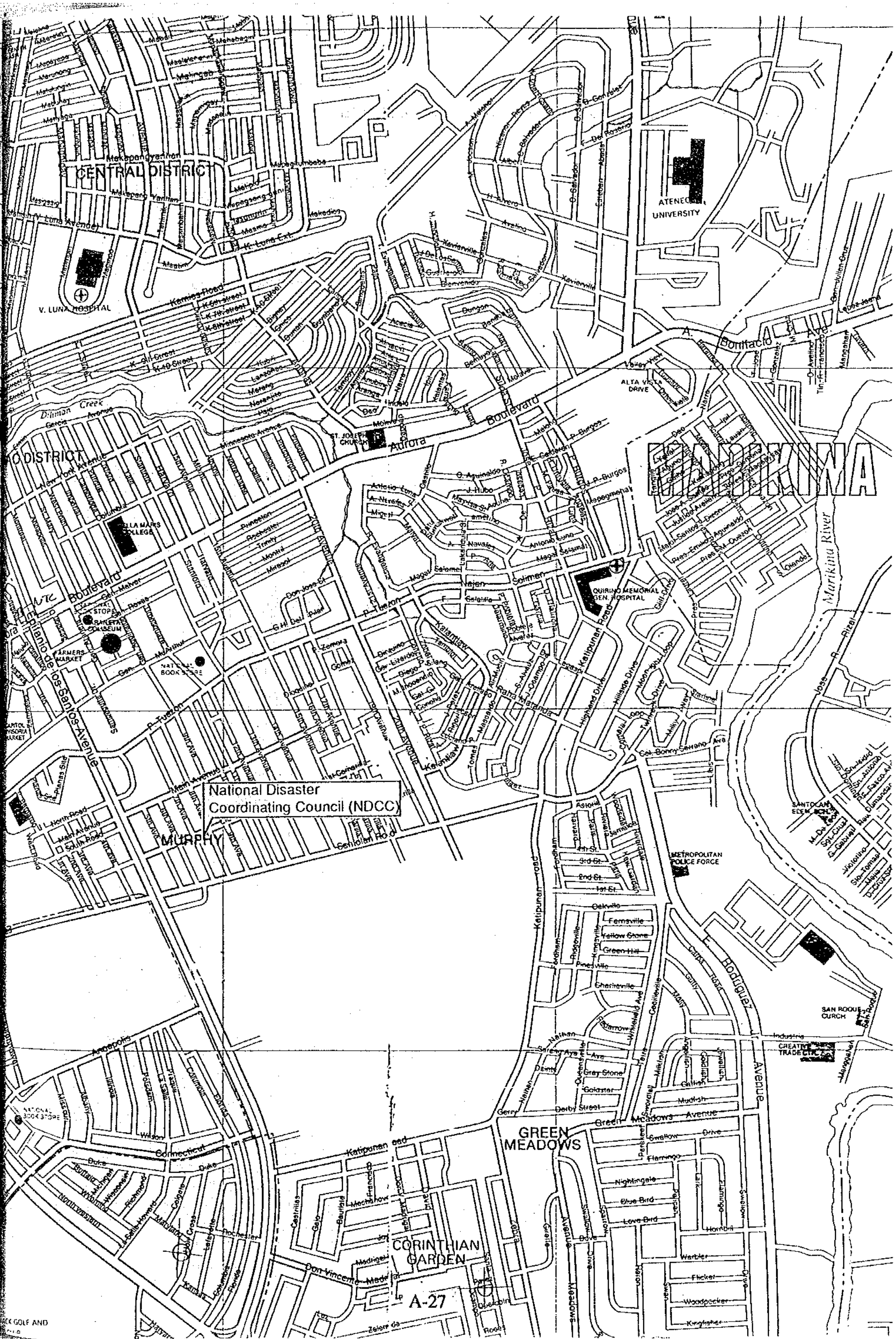
ANNEX 6 Drawings of each Site

ANNEX 6-1 Installation Sites for Terminal Equipment in Metro Manila

Organization	Address	Distance from Hub Station
Depertment of Health (DOH)	Rizal Avenue, San Lazaro CPD, STA. Cruz, Manila	5 Km
Department of Public Works & Highways (DPWH)	Bonifacio Drive, Port Area, Manila	8 Km
Department of Social Welfare and Development (DSWD)	Batasang Pambansa Building, Fairview, Quezon City	9 Km
Philippine National Red Cross (PNRC)	Bonifacio Drive, Port Area, Manila	8 Km
Department of Interior and Local Government (DILG)	PNCC Building, EDSA, Mandaluyong, Metro Manila	7 Km
National Disaster Coordinating Council (NDCC)	Camp Aguinaldo, EDSA, Quezon City	4 Km


Dept. of Health (DOH)
Philippine National Red Cross (PNRC)
Dept. of Public Works & Highways (DPWH)
Manila North Harbor
Manila South Harbor
Pasig River
Pier 16
Pier 14
Pier 12
Pier 10
Pier 8
Pier 6
Pier 4
Pier 2
Pier 1
Pier 3
Pier 5
Pier 7
Pier 9
PORT TERMINAL
TONDO
QUIAPO
TRAMUROS
RIZAL PARK
Marcos Road
Claro M. Recto
SAN LAZARO RACE TRACK
SUNKEN GARDEN
FREEDOM PARK
MANILA HOTEL


MANDALUYONG
MAKATI
Dept. of Interior
& Local Government (DILG)
Shaw Boulevard
Epifanio de los Santos Avenue
WOMEN'S CORRECTIONAL INSTITUTION
MENTAL HOSPITAL
BAPTIST CHURCH
NATIONAL BOOK STORE
ASIAN DEVELOPMENT BANK
Makati - Mandaluyong Bridge
J.P. Rizal Avenue
ROCKWELL STATION MANILA ELECTRIC CO.
COLEGIO DE STA. ROSA
SAN CARLOS SEMINARY
GUADALUPE
West Capitol Drive
Paseo de Roxas
Gil Puyat (Buendia Ave.)
URDANETA VILLAGE
SAN MIGUEL VILLAGE
HOTEL INTERCONTINENTAL
FORBES PARK NORTH
FORBES PARK SOUTH
SAN ANTONIO CHURCH
McKinley Road
Palm Avenue
MANILA GOLF CLUB
MANILA POLO CLUB
Tamarind Road
AMERICAN WAR MEMORIAL CEMETERY
FORT BONIFACIO ELEM. SCH.



CENTRAL DISTRICT
V. LUNA HOSPITAL
ATENEO UNIVERSITY
A. Bonifacio Ave.
ALTA VISTA DRIVE
Aurora Boulevard
ST. JOSEPH CHURCH
MARIKINA
Marikina River
Dilman Creek
NEW YORK AVENUE
MARYKNOLL COLLEGE
QUIRINO MEMORIAL GEN. HOSPITAL
Katipunan Road
National Disaster
Coordinating Council (NDCC)
MURPHY
Santolan Road
METROPOLITAN POLICE FORCE
SAN ROQUE CHURCH
CREATIVE TRADE CTR.
Jose P. Rizal
Col. Bonny Serrano Ave
Epifanio de los Santos Avenue
Annapolis
Connecticut
Wilson
GREEN MEADOWS
Green Meadows Avenue
CORINTHIAN GARDEN
Katipunan Road
E. Rodriguez Avenue
Don Vicente Madrigal
NATIONAL BOOK STORE
ARANETA COLISEUM
FARMERS MARKET
P. Tuazon
Main Avenue
North Road
South Road

ANNEX 6-2 Guide map and Layouts of each Site

Regions	Locations	Regions	Locations
NCR	TELOF	4	Batangas
	(Manila Hub 局)		Boac
	DOTC		Lucena
	NTC		Romblon
	Malacanang		
	TTI	5	Legaspi
			Virac
1	Baguio		Naga
	Laoag		
	Lingayen	6	Iloilo
	San Fernando		
	Vigan	7	Cebu
2	Tuguegarao	8	Tacloban
	Aparri		Catarman
	Ilagan		Ormoc
	Bayombong		Catbalogan
3	Malolos	11	Davao
	Iba		
	Tarlac		
	Cabanatuan		

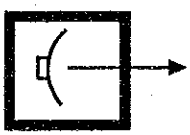
Description of the Drawings

The VSAT station at each site consists of following drawings ;

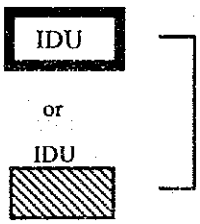
- Guide Map (Drawing No.1/3)
- Site Layout (Drawing No.2/3)
- Floor Layout (Drawing No.3/3)

[Legend]

: TN means True North

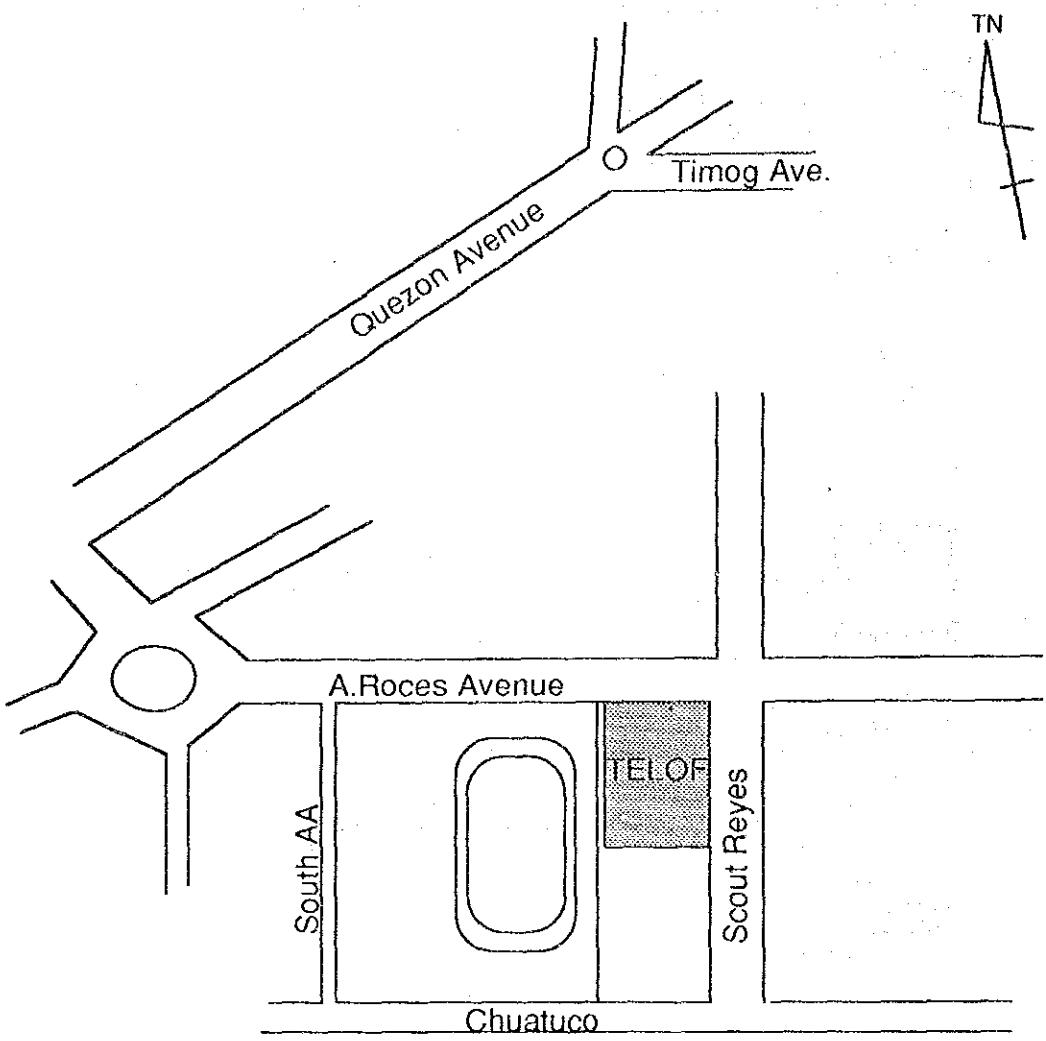


: Installation space for VSAT Antenna
The arrow shows the direction of PALAPA satellite



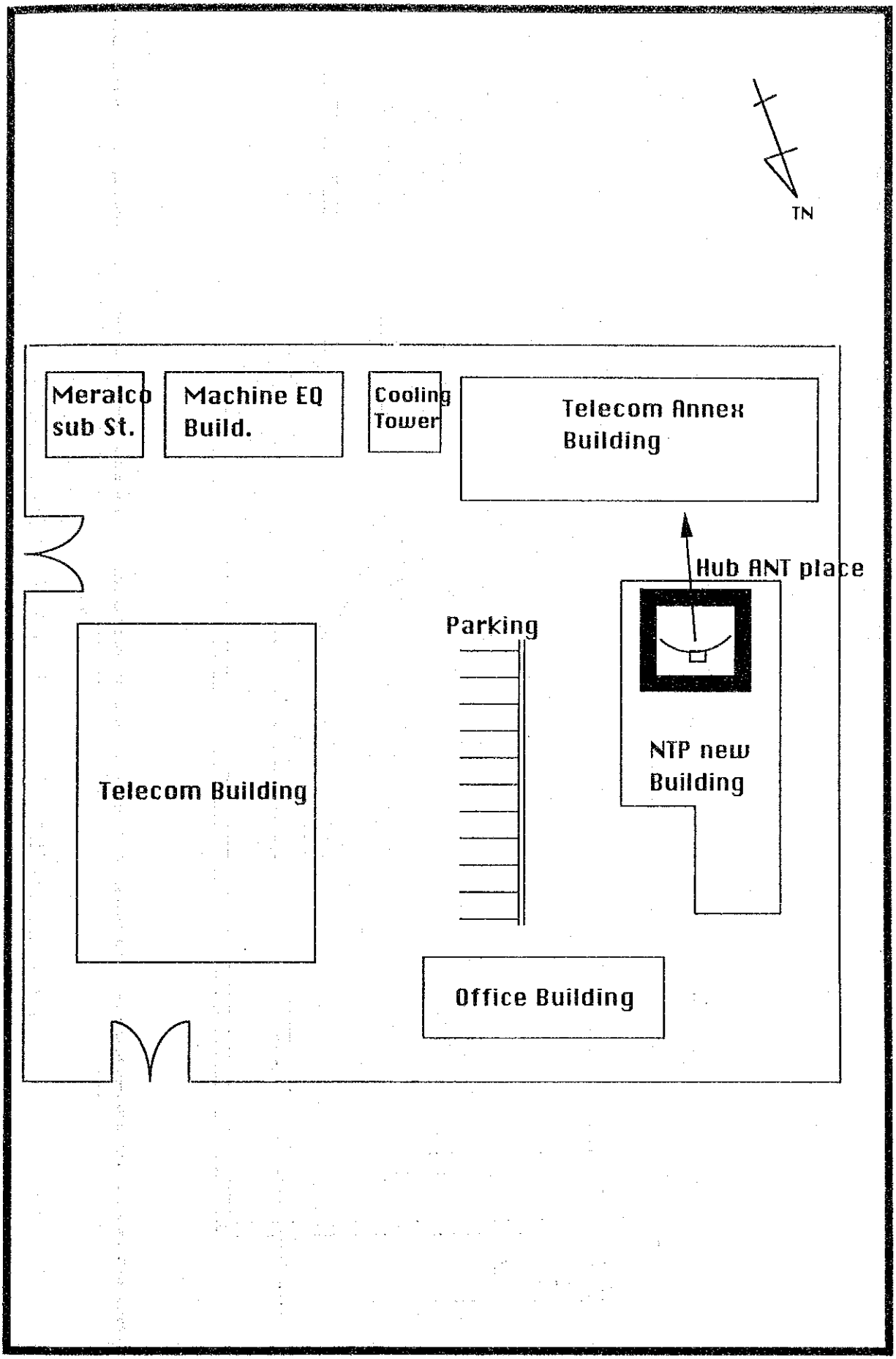
: Installation point of IN DOOR UNIT

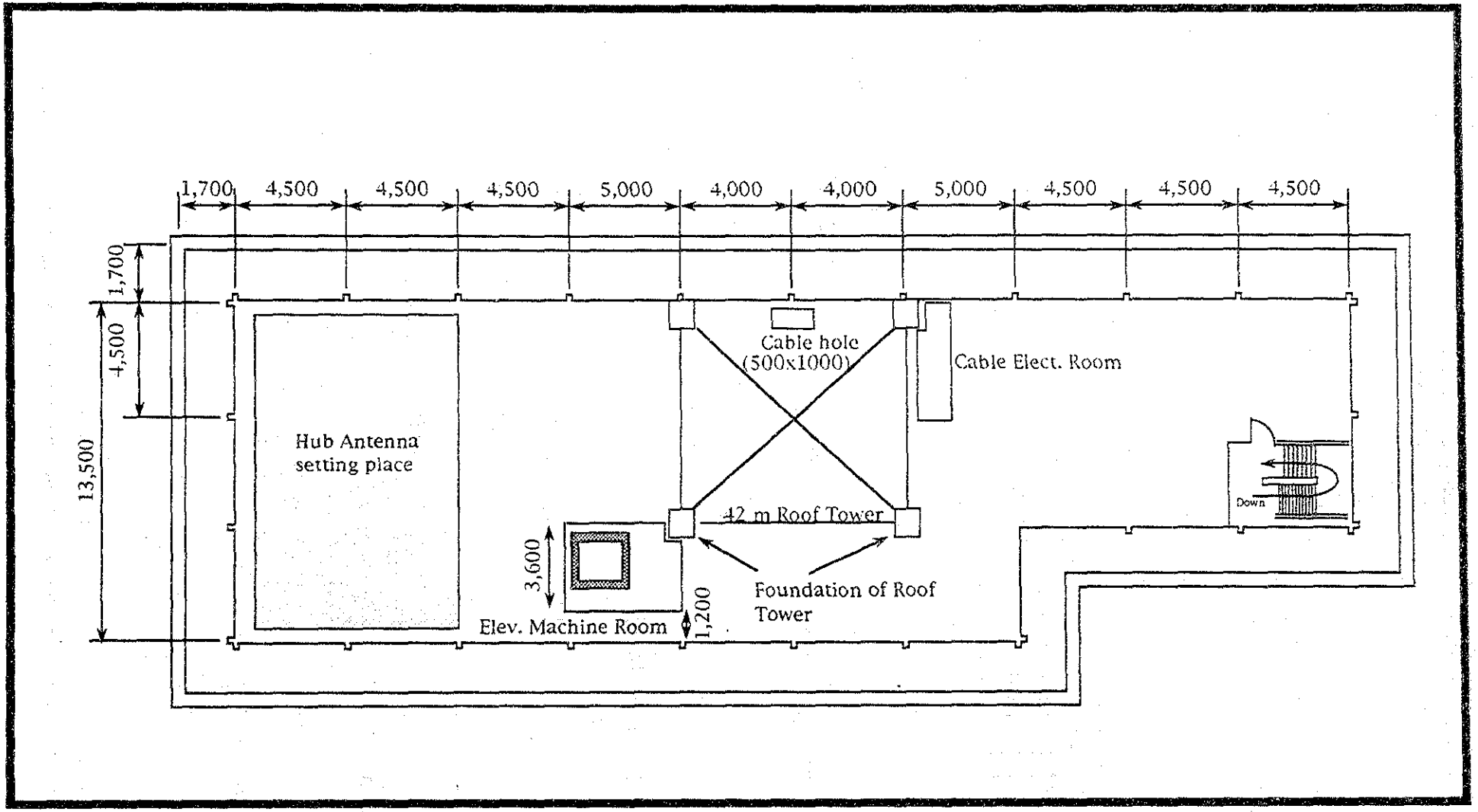
Guide Map of TELOF(Hub Station-1/3)



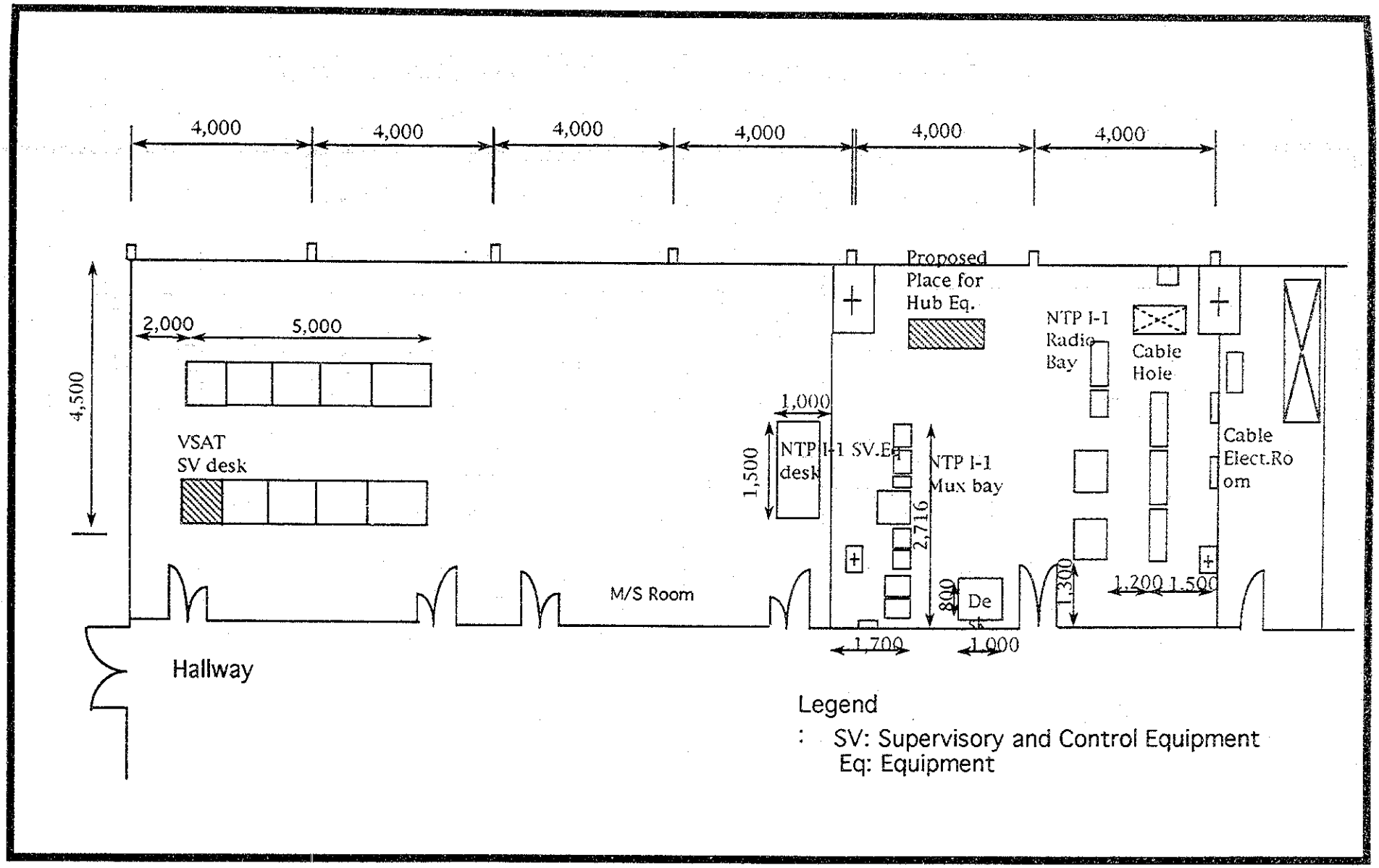
Address: A.Roces Avenue,Quezon City,M.M.

Site Layout of TELOF (Hub Station-2/3)

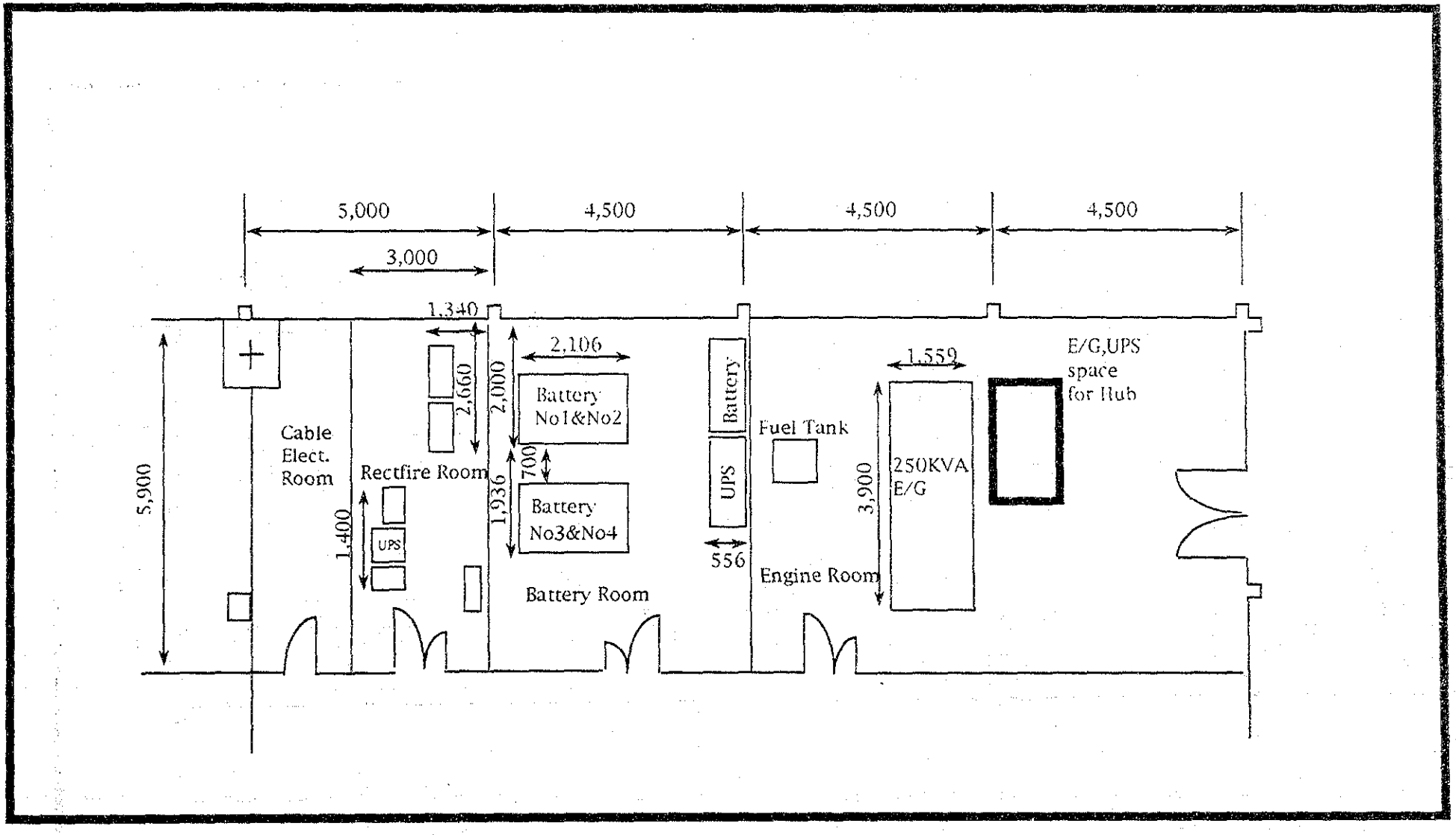




Floor Layout(Roof Top) of TELOF (Hub Station 3/3-1)

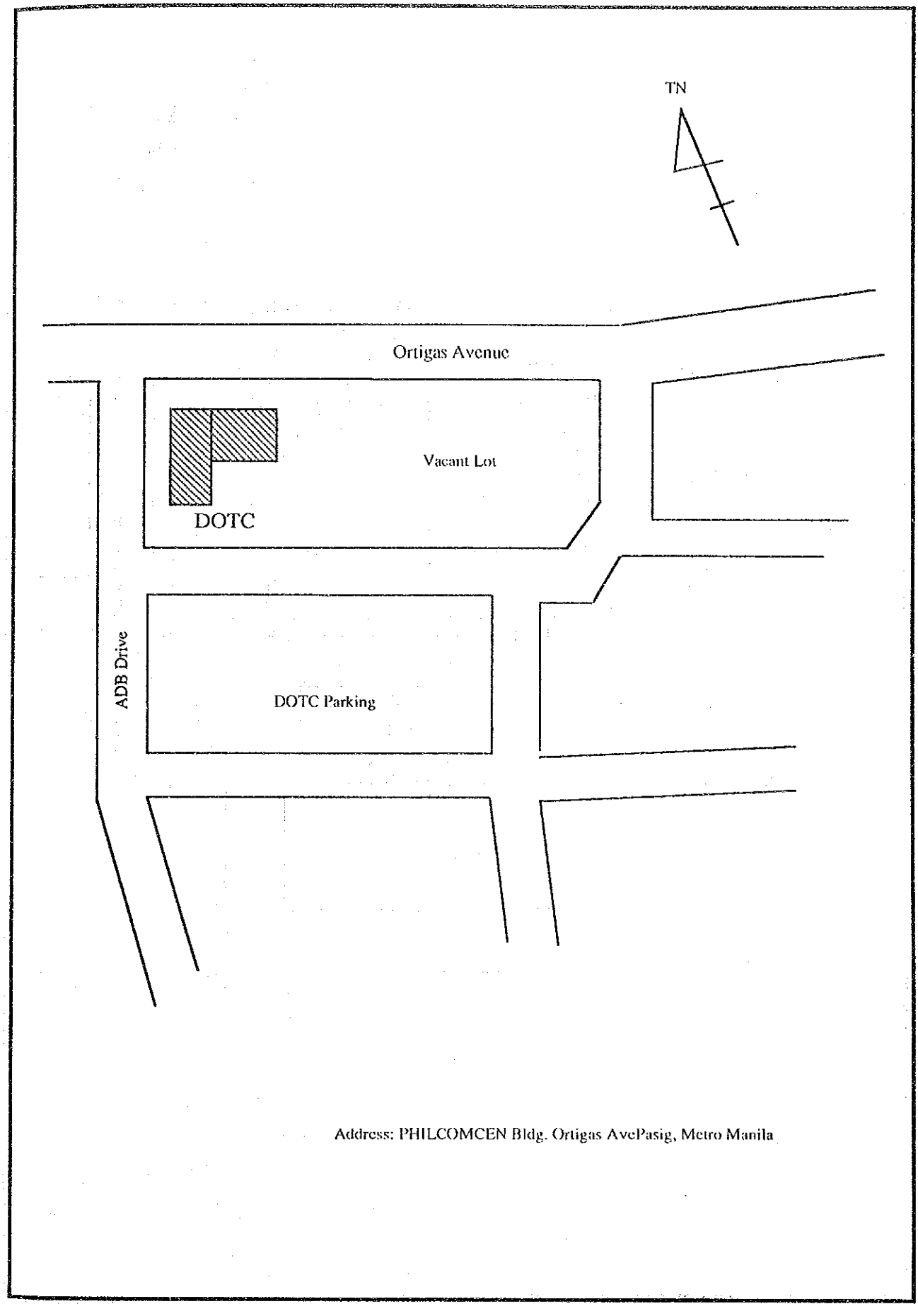


Floor Layout(Radio & MUX-4F) of TELOF (Hub Station 3/3-2)



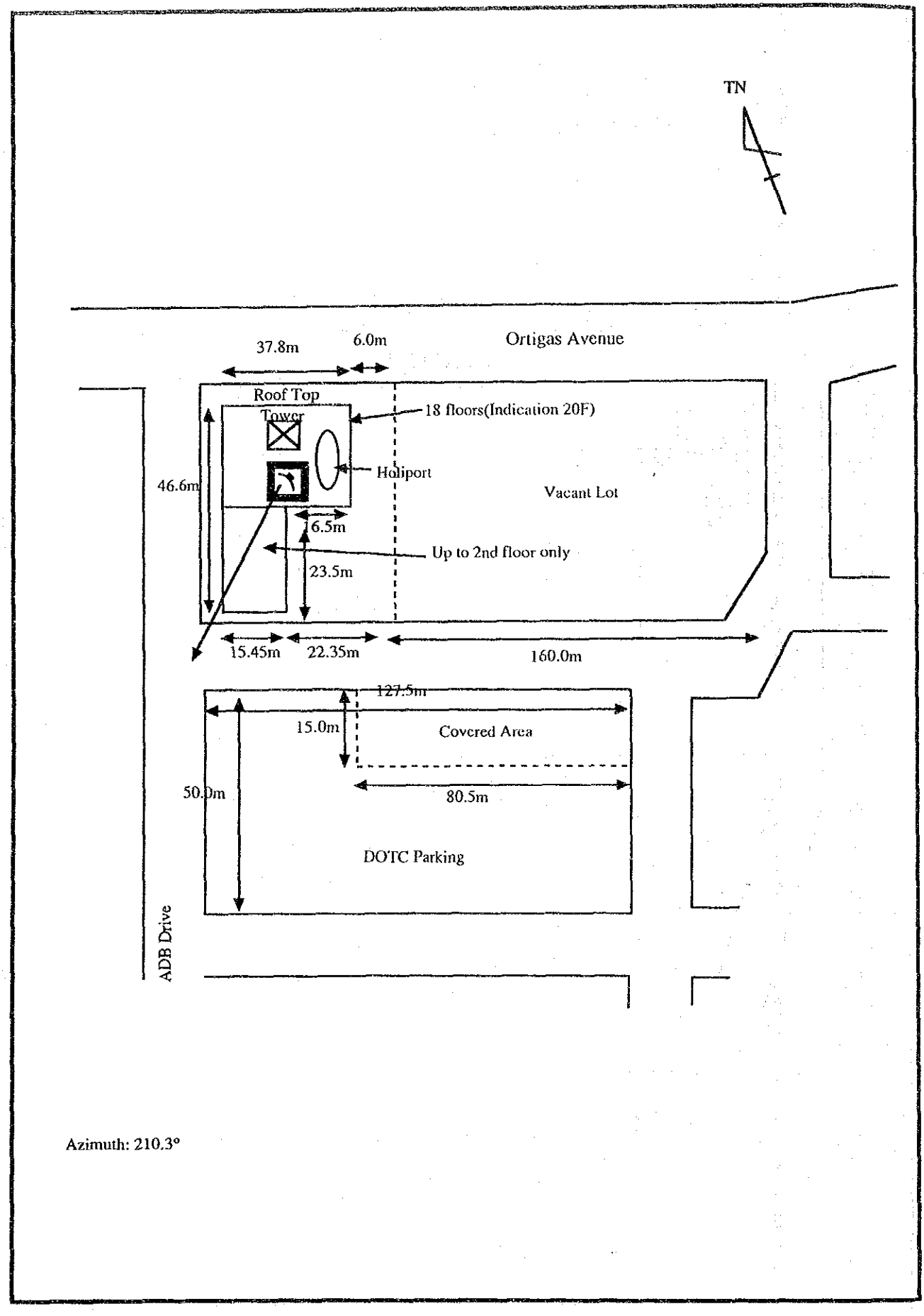
Floor Layout(Power Room-1F) of TELOF (Hub Station 3/3-3)

Guide Map (DOTC-1/3,NCR)



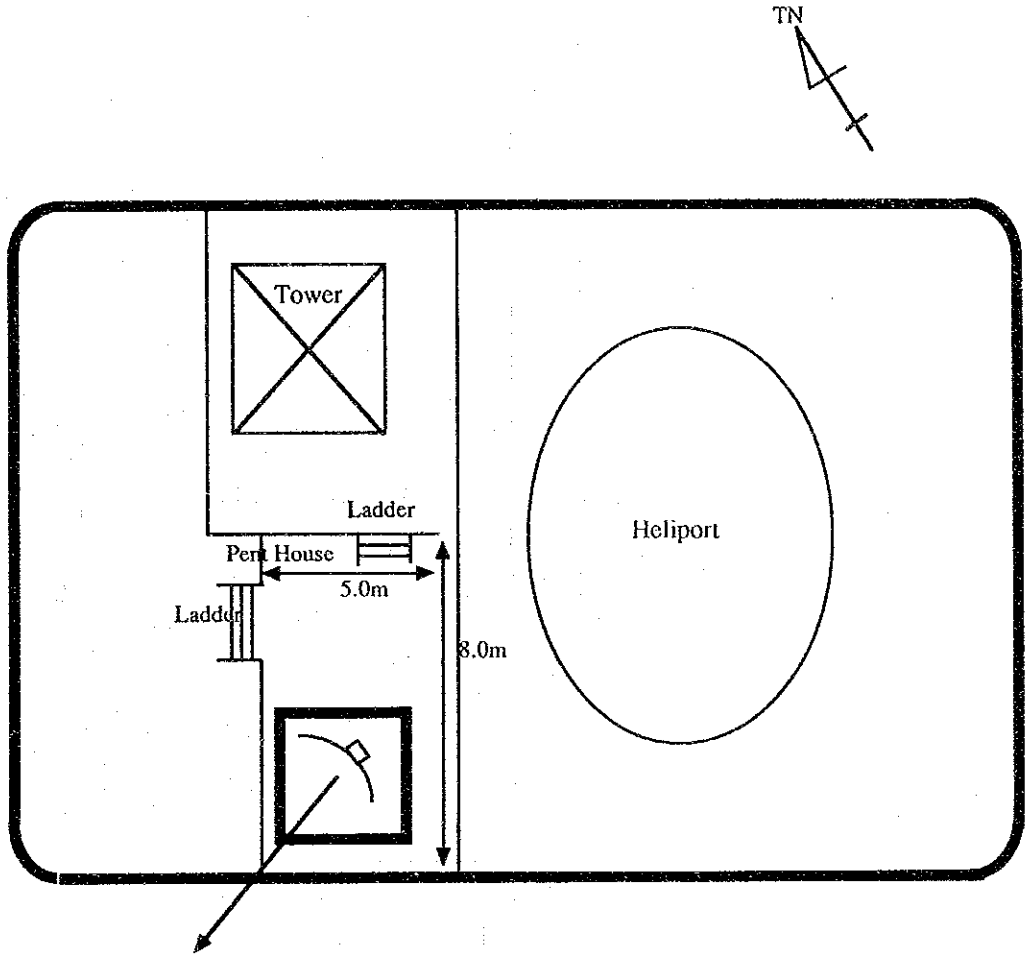
Address: PHILCOMCEN Bldg. Ortigas AvePasig, Metro Manila

Site Layout (DOTC-2/3.NCR)



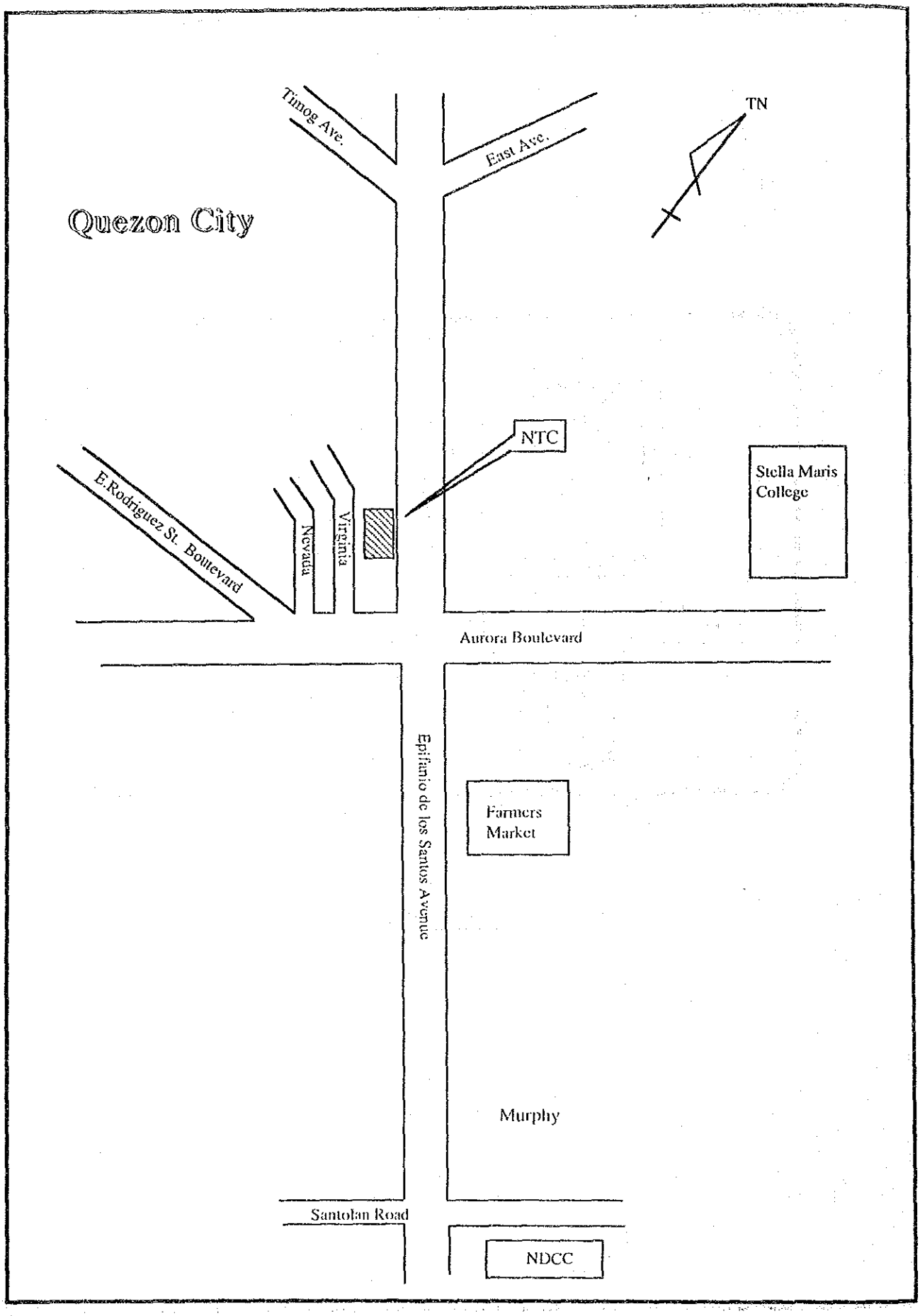
Azimuth: 210.3°

Floor Layout (DOTC-3/3,NCR)

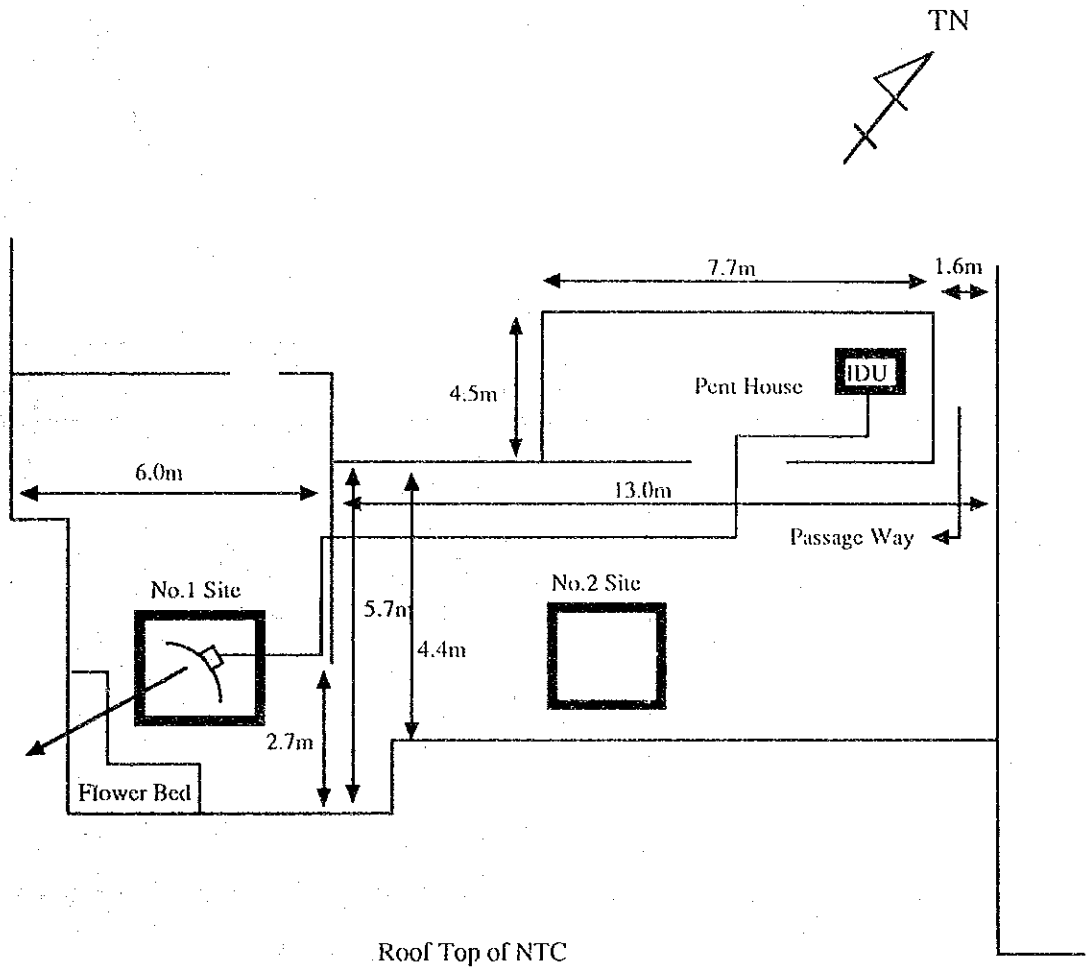


20F Roof Top

Guide Map (NTC-1/3,NCR)



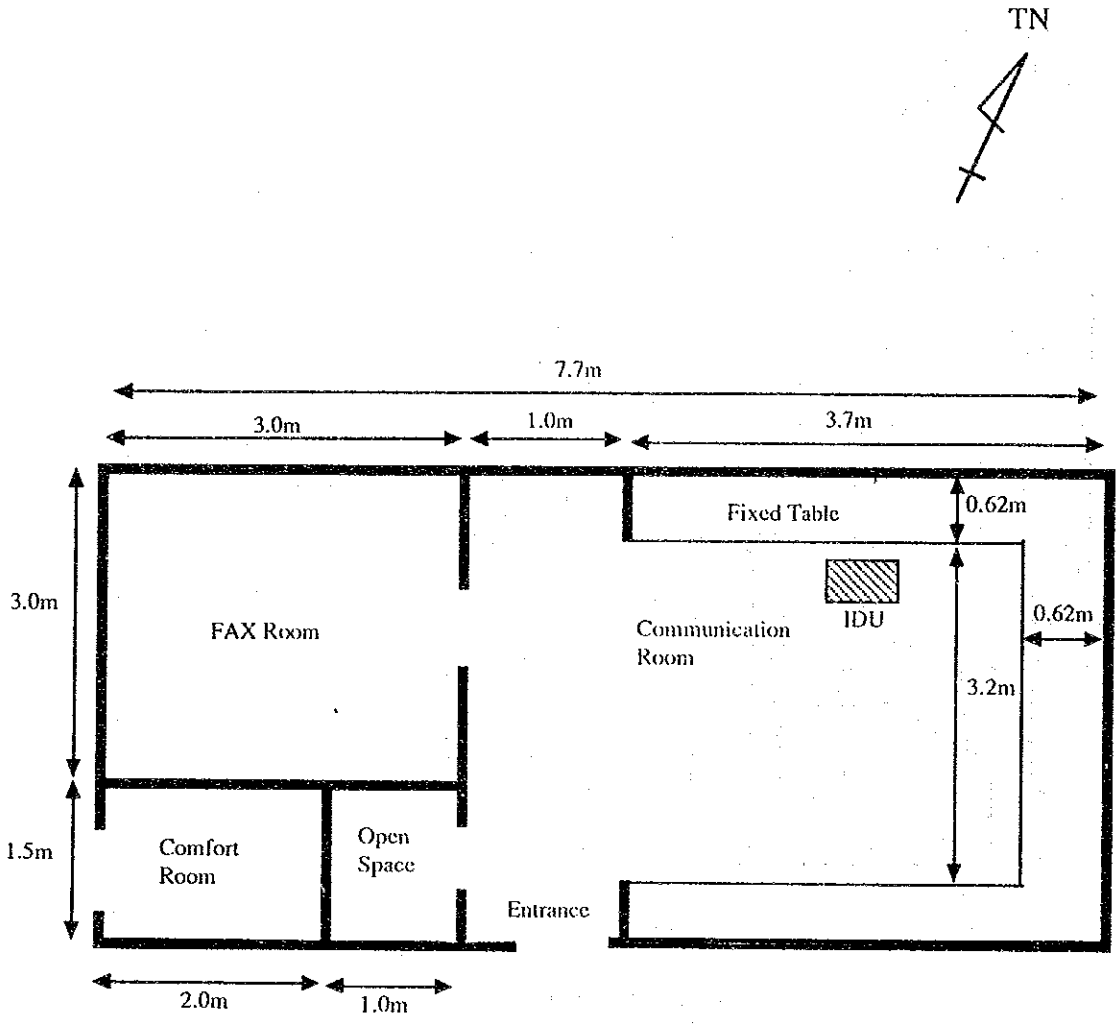
Site Layout (NTC-2/3,NCR)



Roof Top of NTC

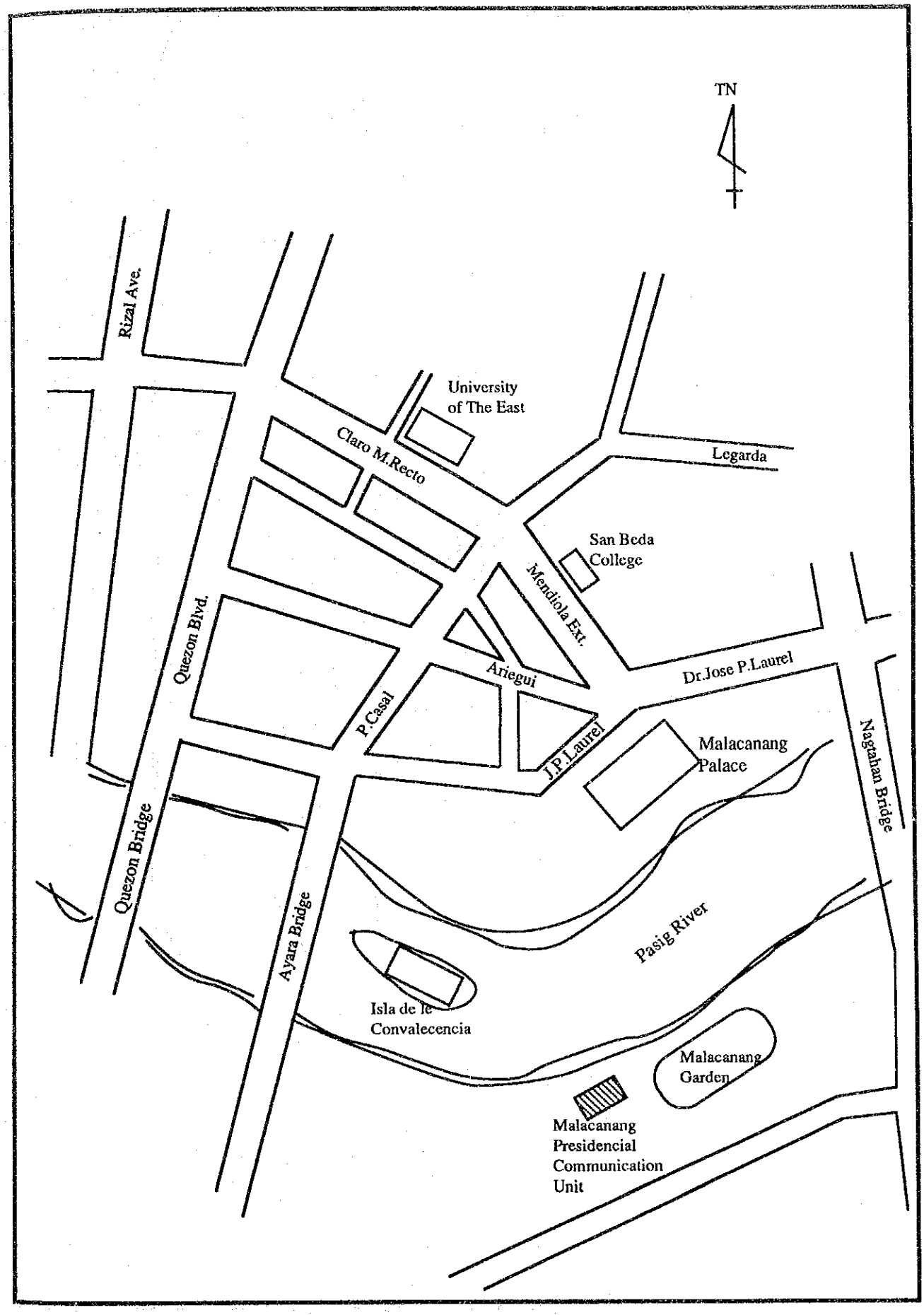
Azimuth: 209.3°

Floor Layout (NTC-3/3,NCR)

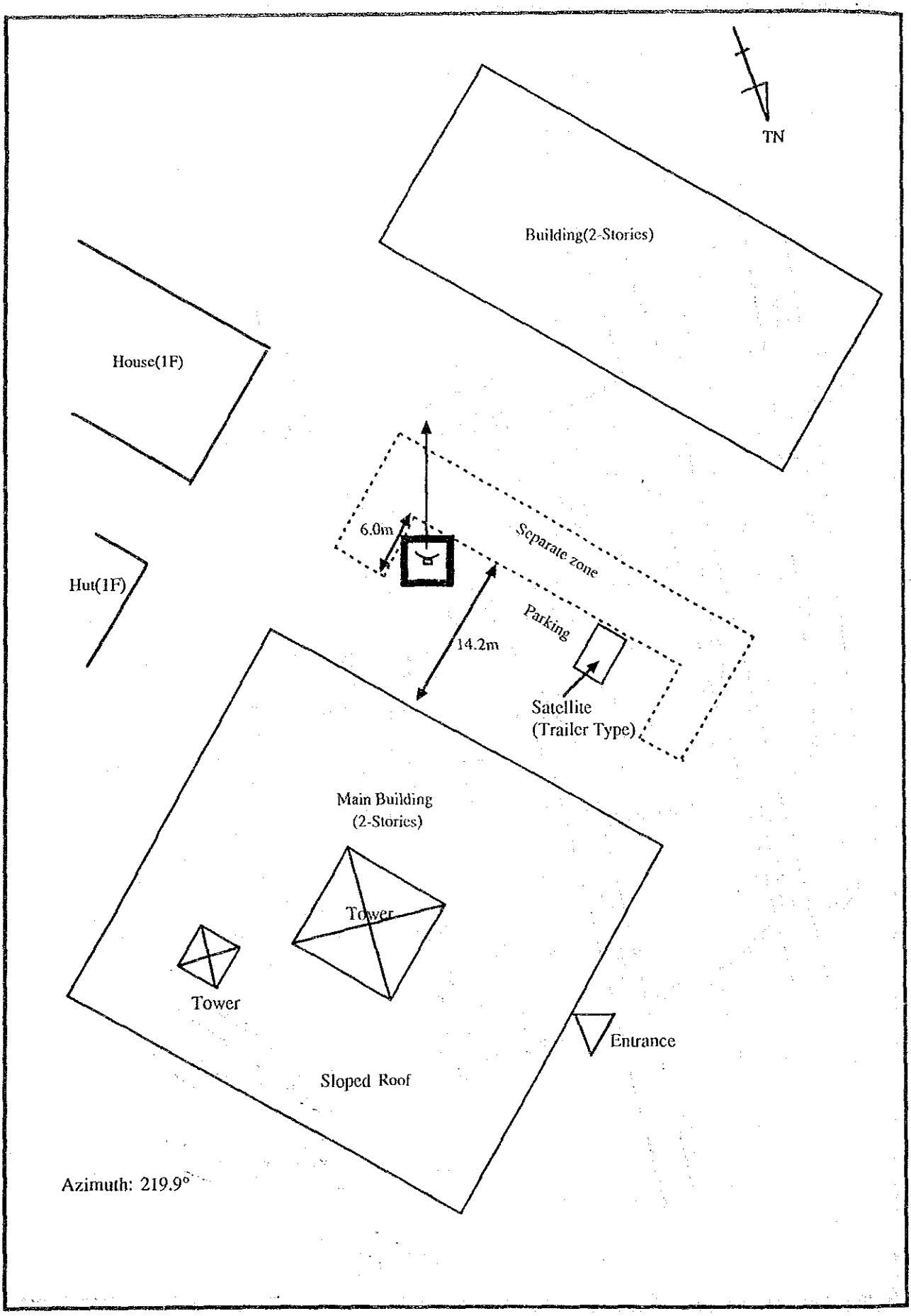


Pent House on the Roof Top

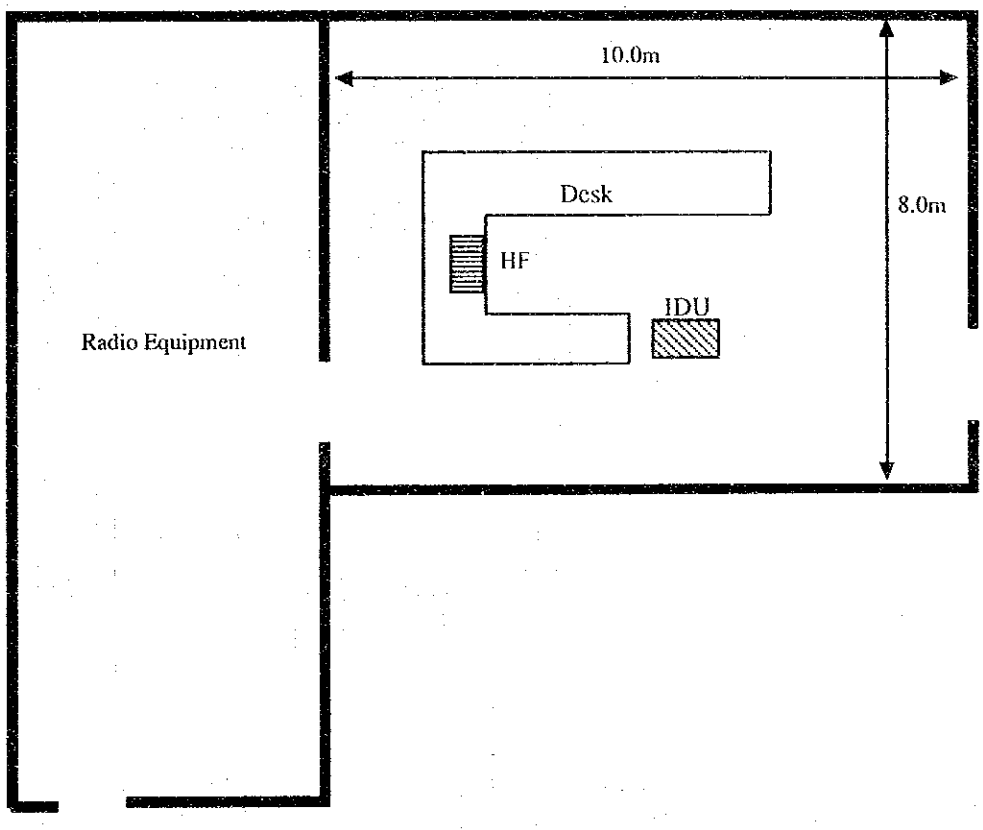
Guide Map (Malacanang-1/3,NCR)



Site Layout (Malacanang-2/3,NCR)

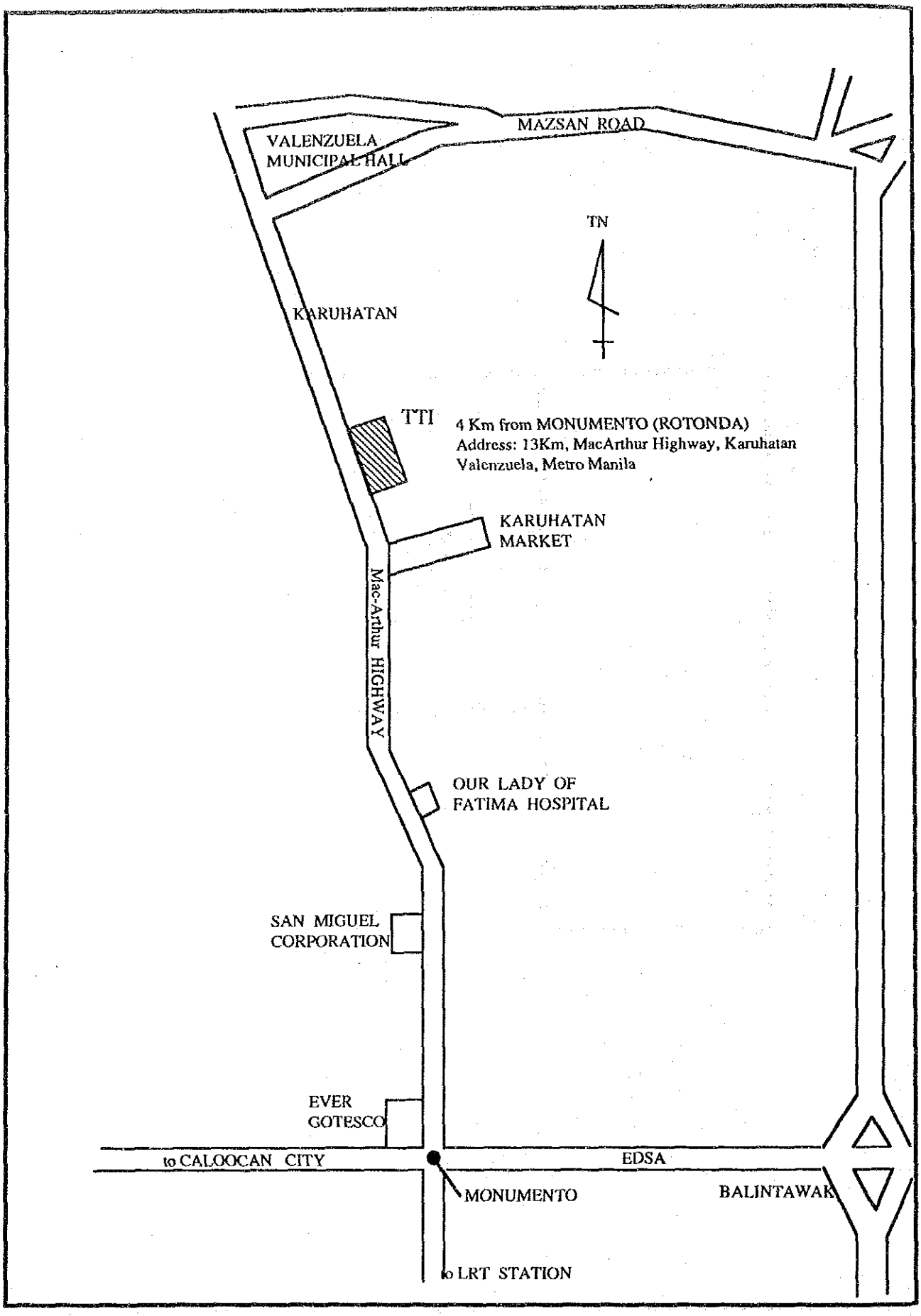


Floor Layout (Malacanang-3/3,NCR)

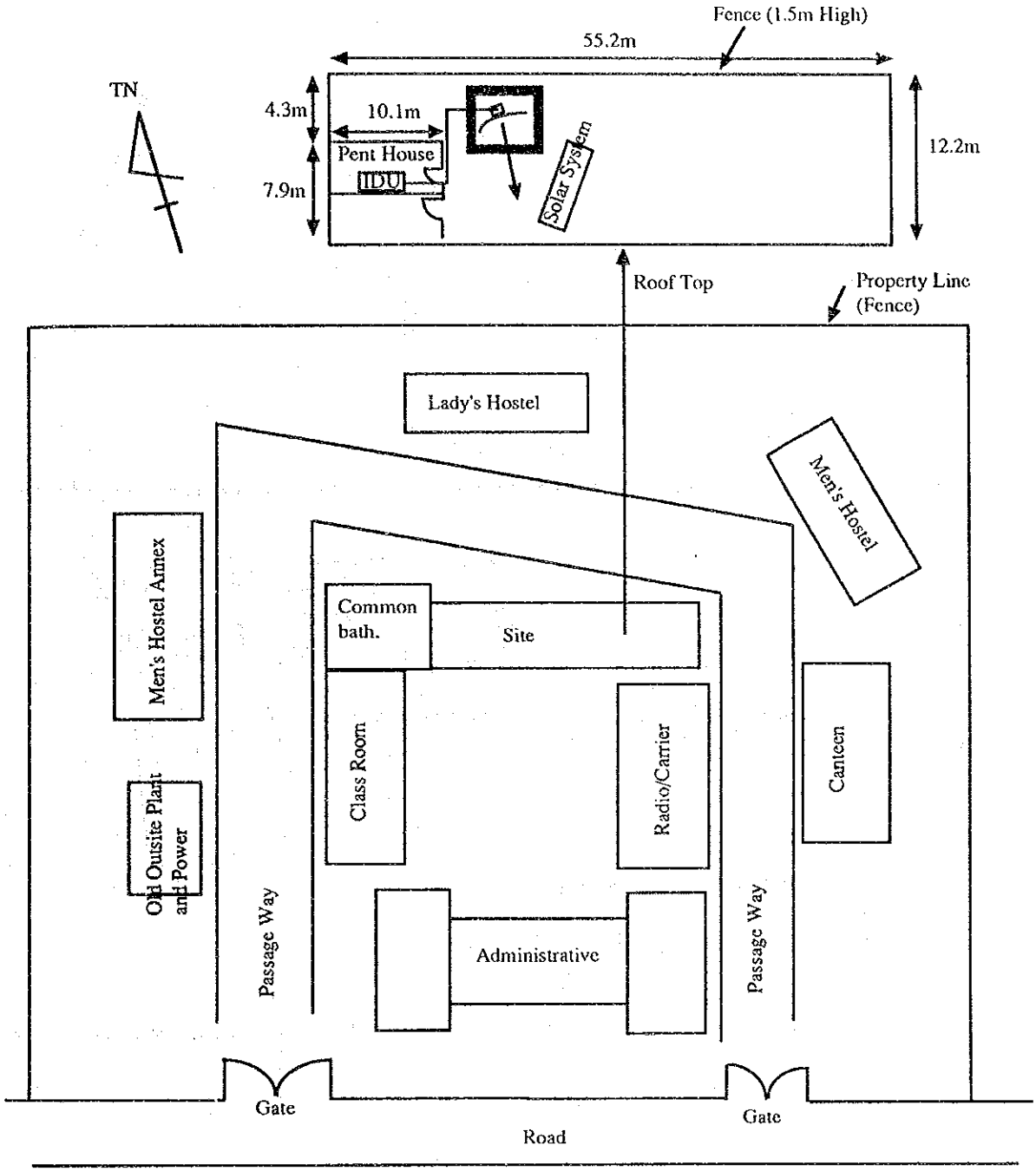


Radio Section(2F)

Guide Map (TTI-1/3,NCR)

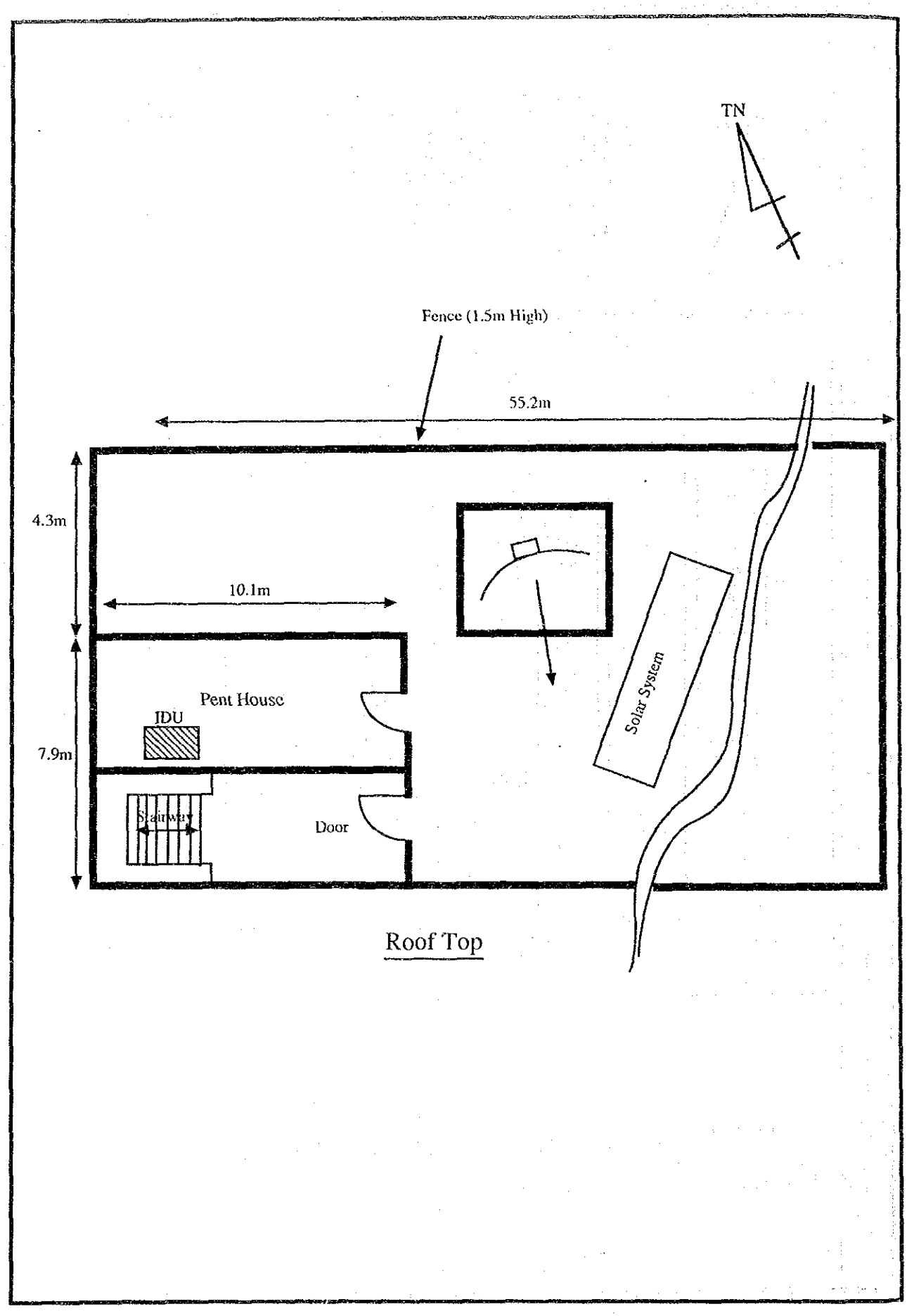


Site Layout (TTI-2/3,NCR)



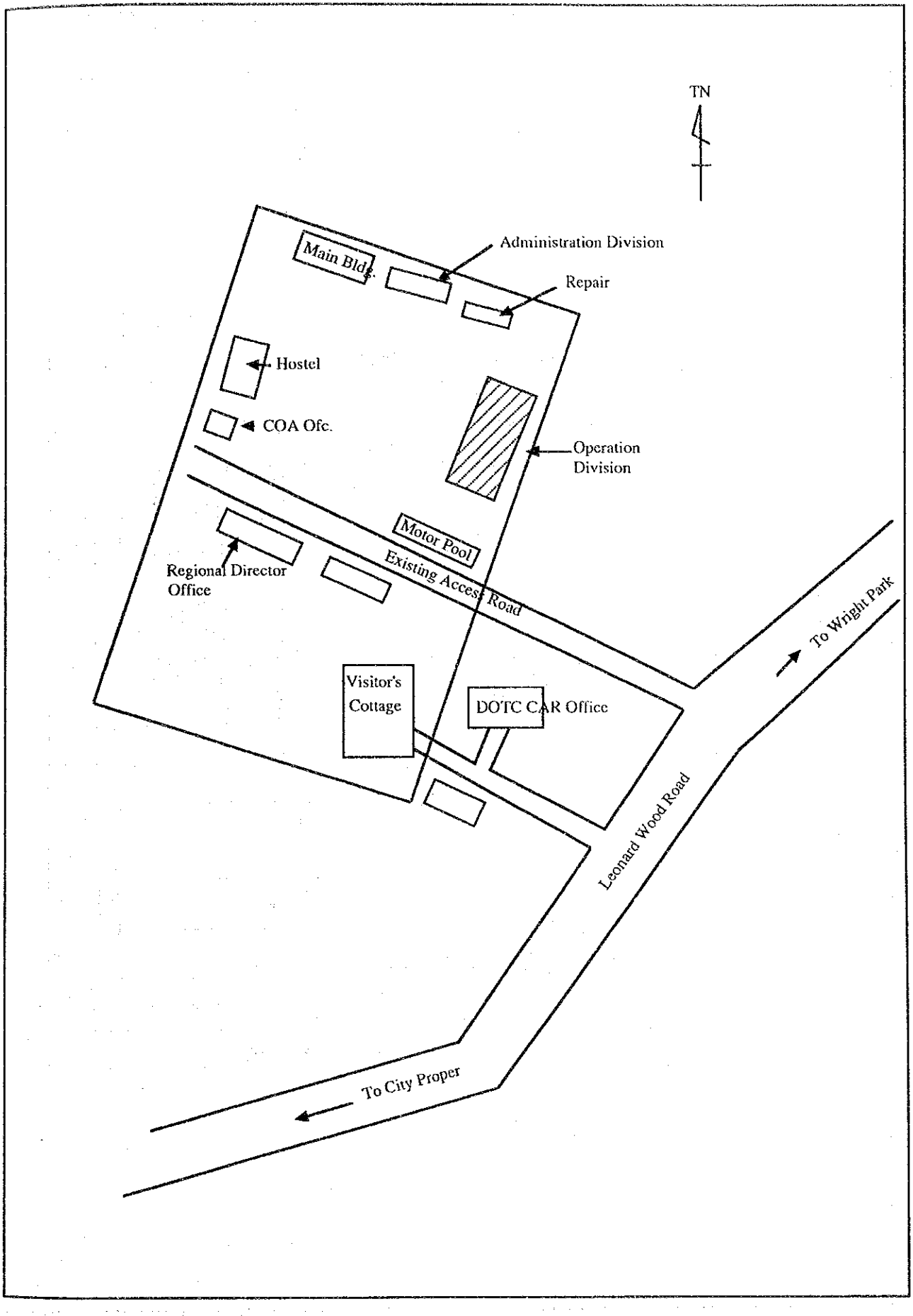
Azimuth: 209.3

Floor Layout (TTI-3/3,NCR)

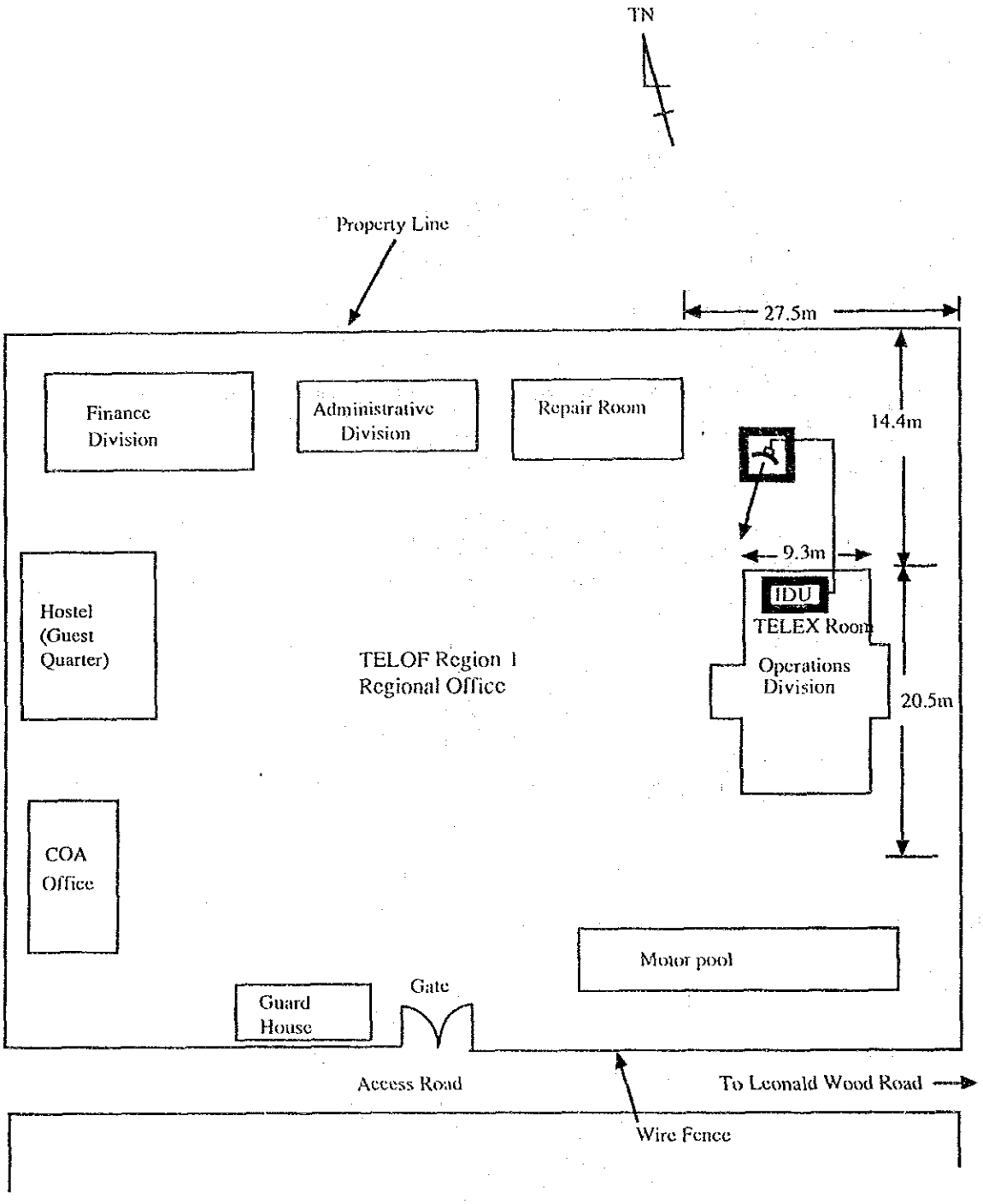


Roof Top

Guide Map (Baguio-1/3,Region I)

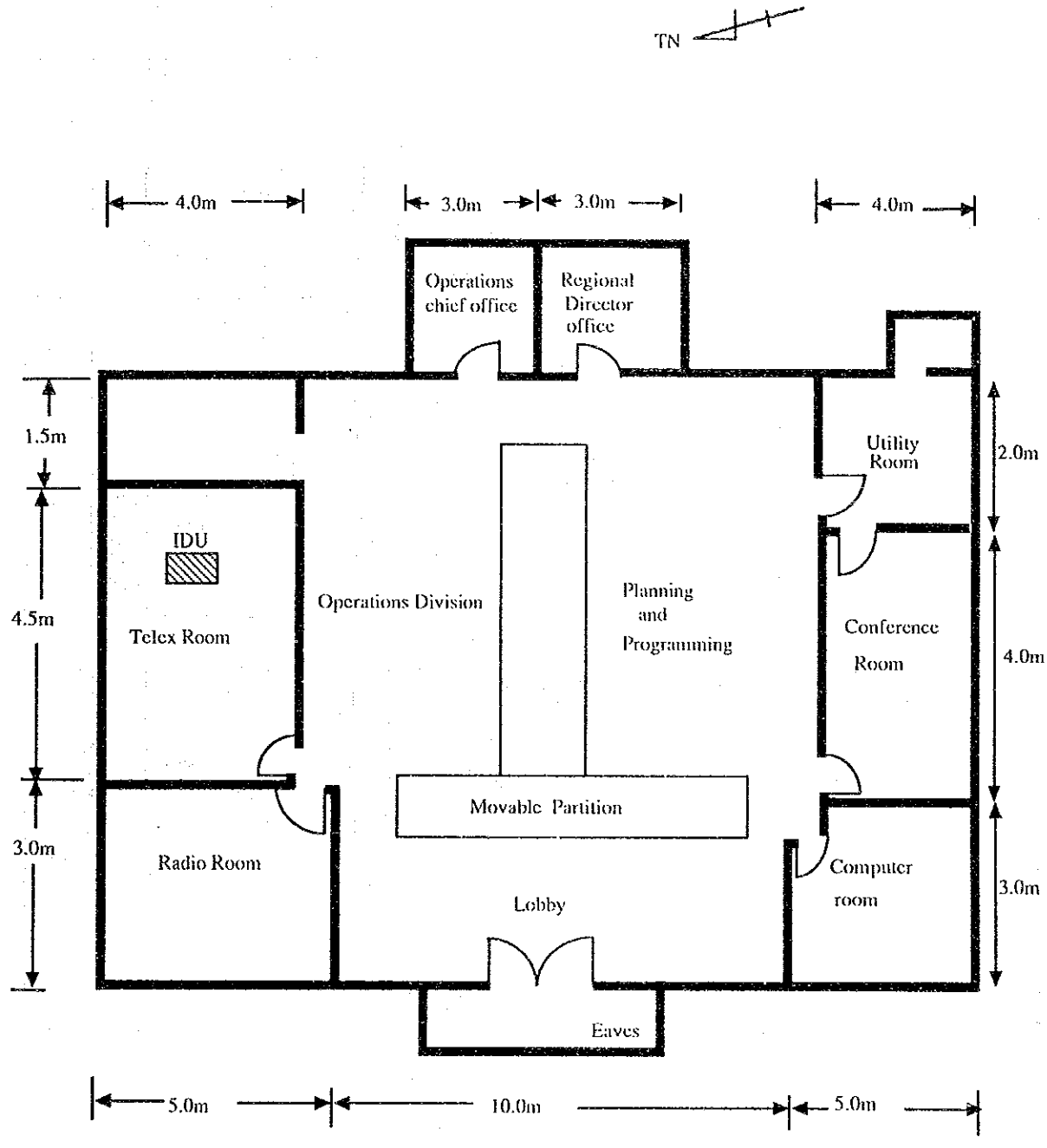


Site Layout (Baguio-2/3,Region I)



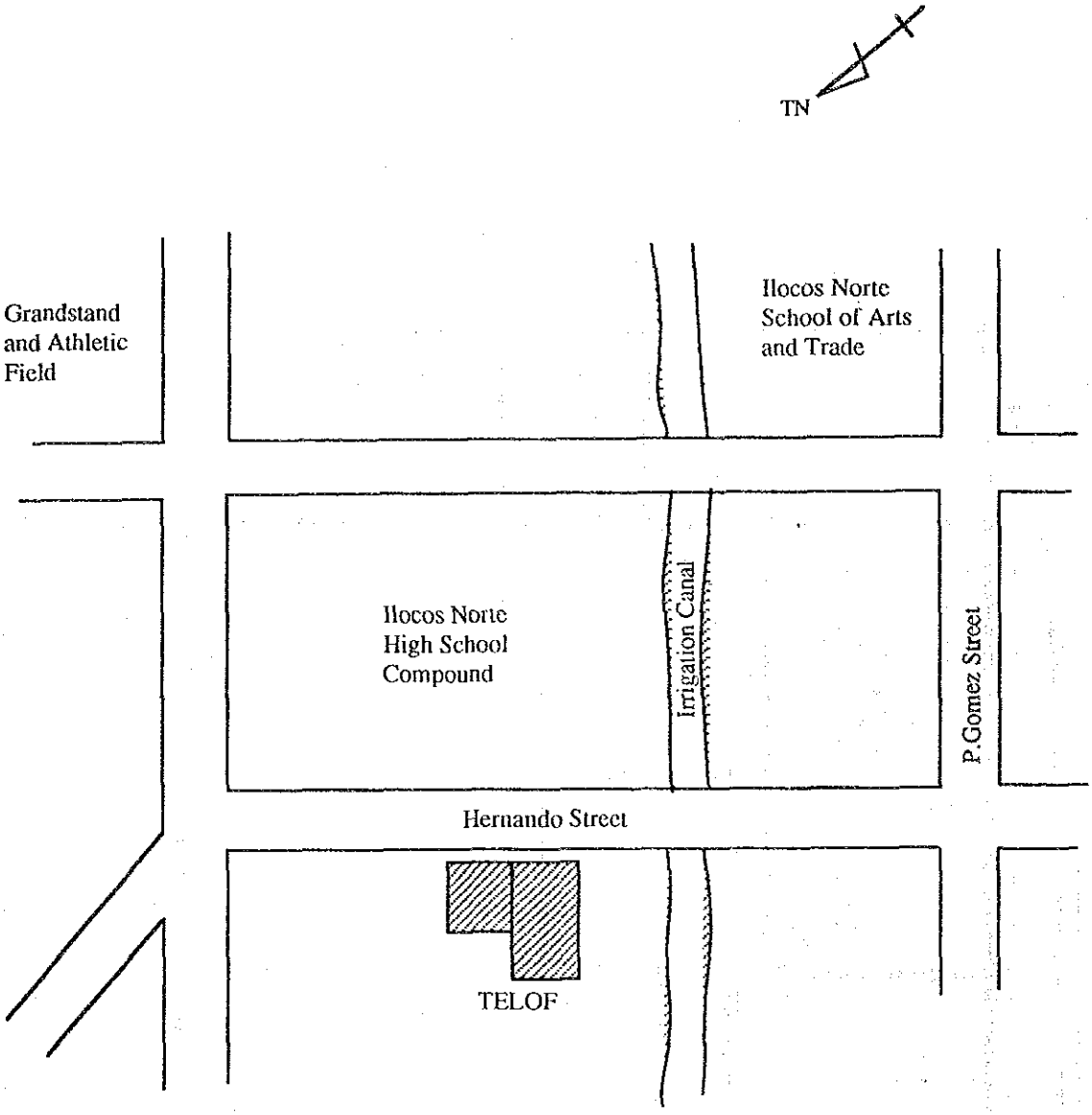
Azimuth: 205.3°

Floor Layout (Baguio-3/3,Region I)

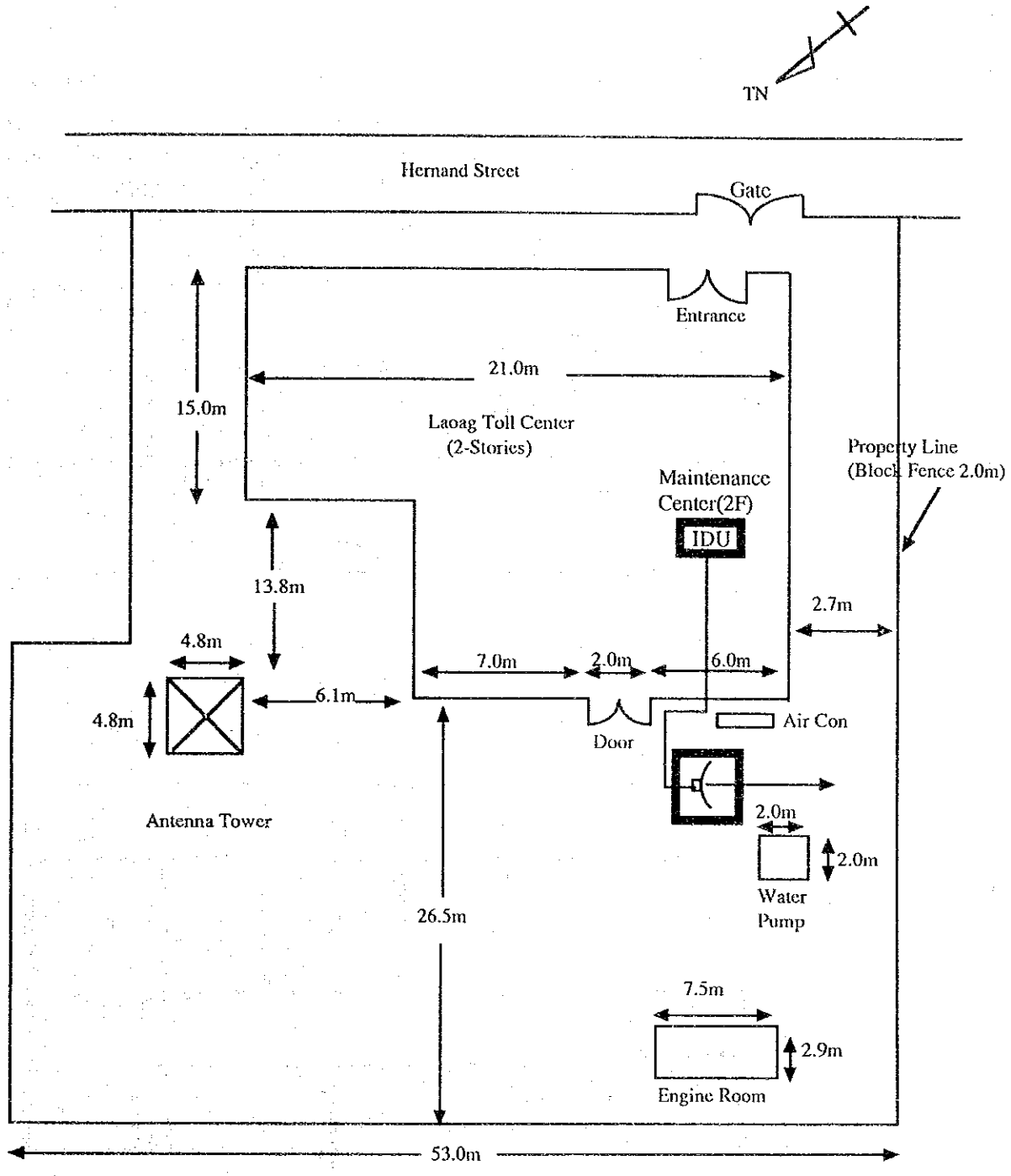


Operation Division

Guide Map (Laoag-1/3,Region I)

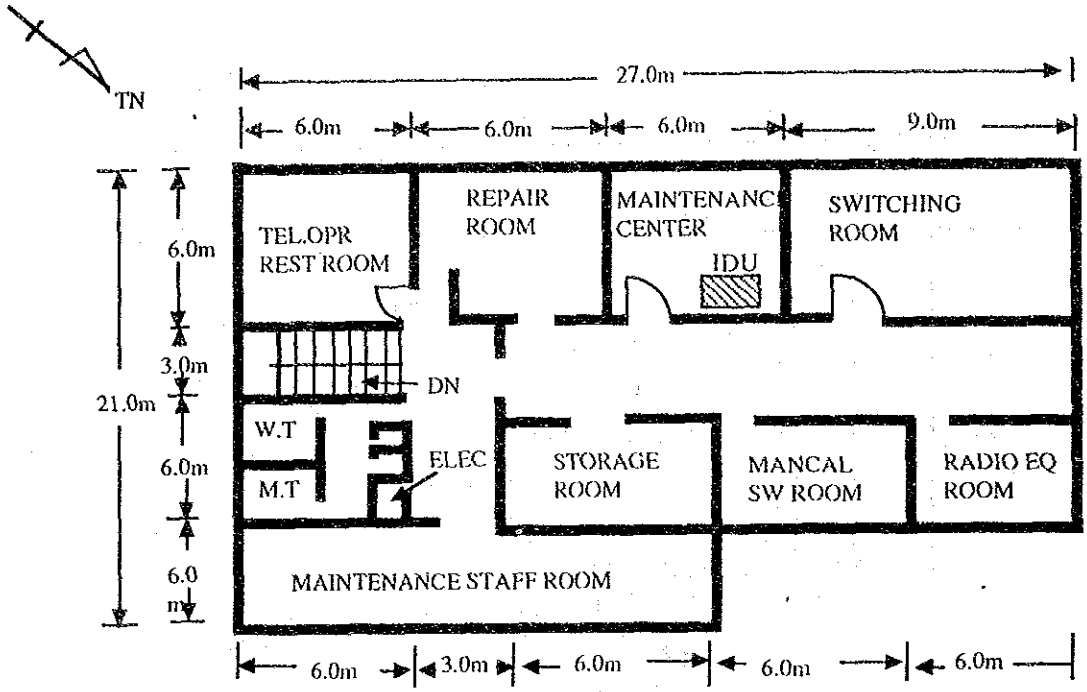


Site Layout (Laoag-2/3,Region I)

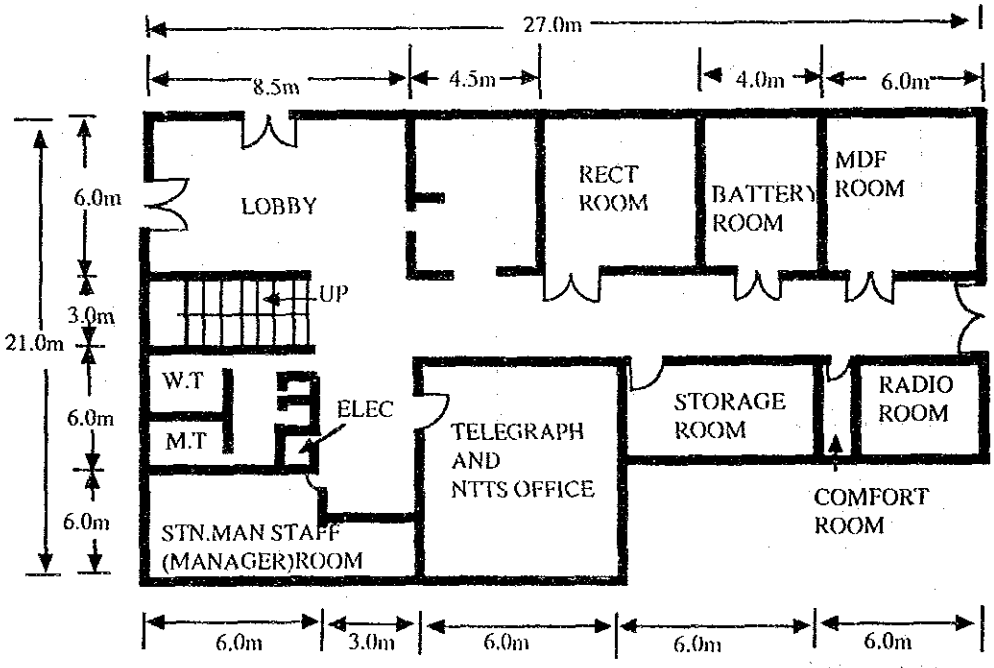


Azimuth : 203.1°

Floor Layout (Laoag-3/3,Region I)

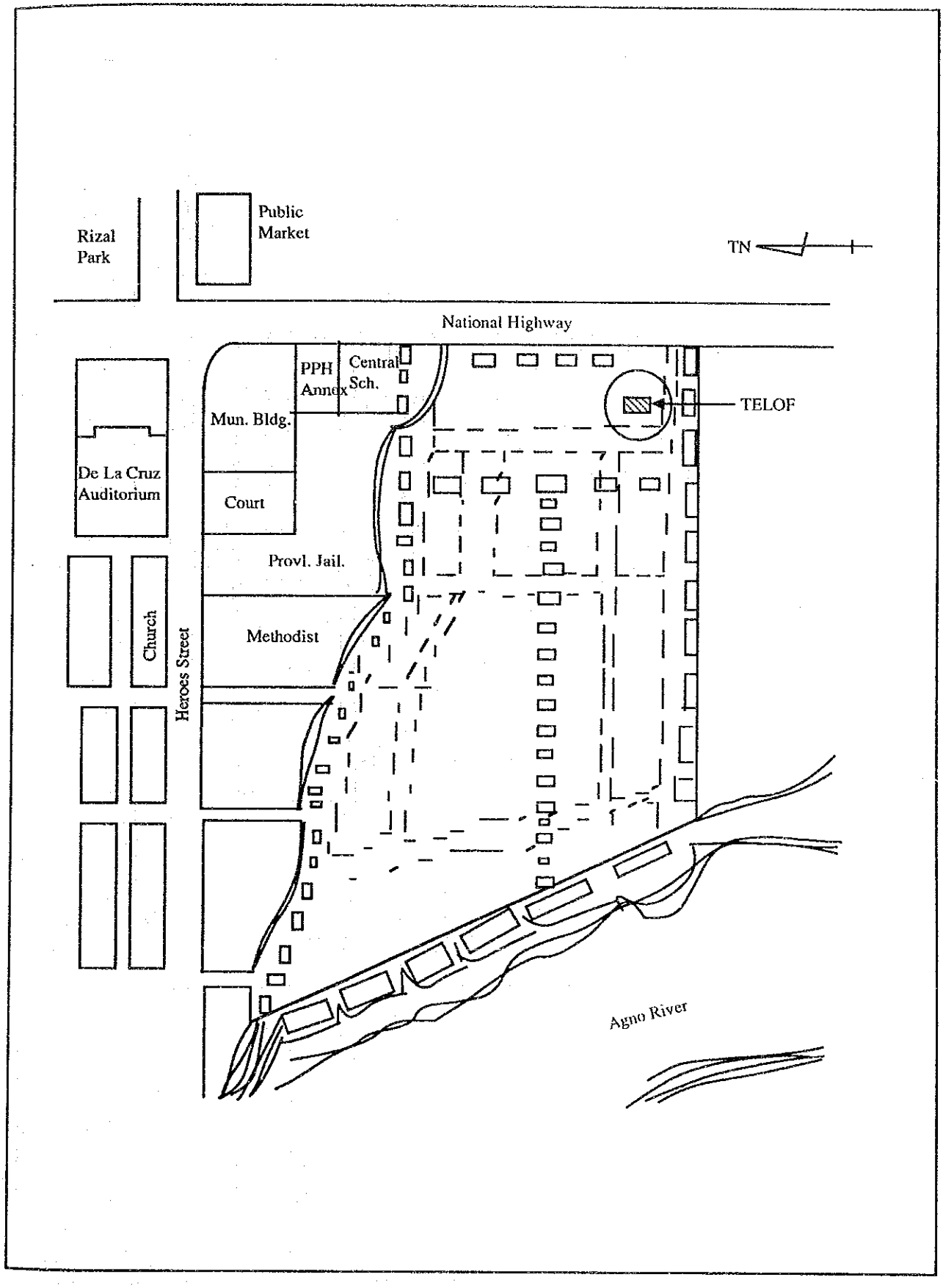


Second Floor

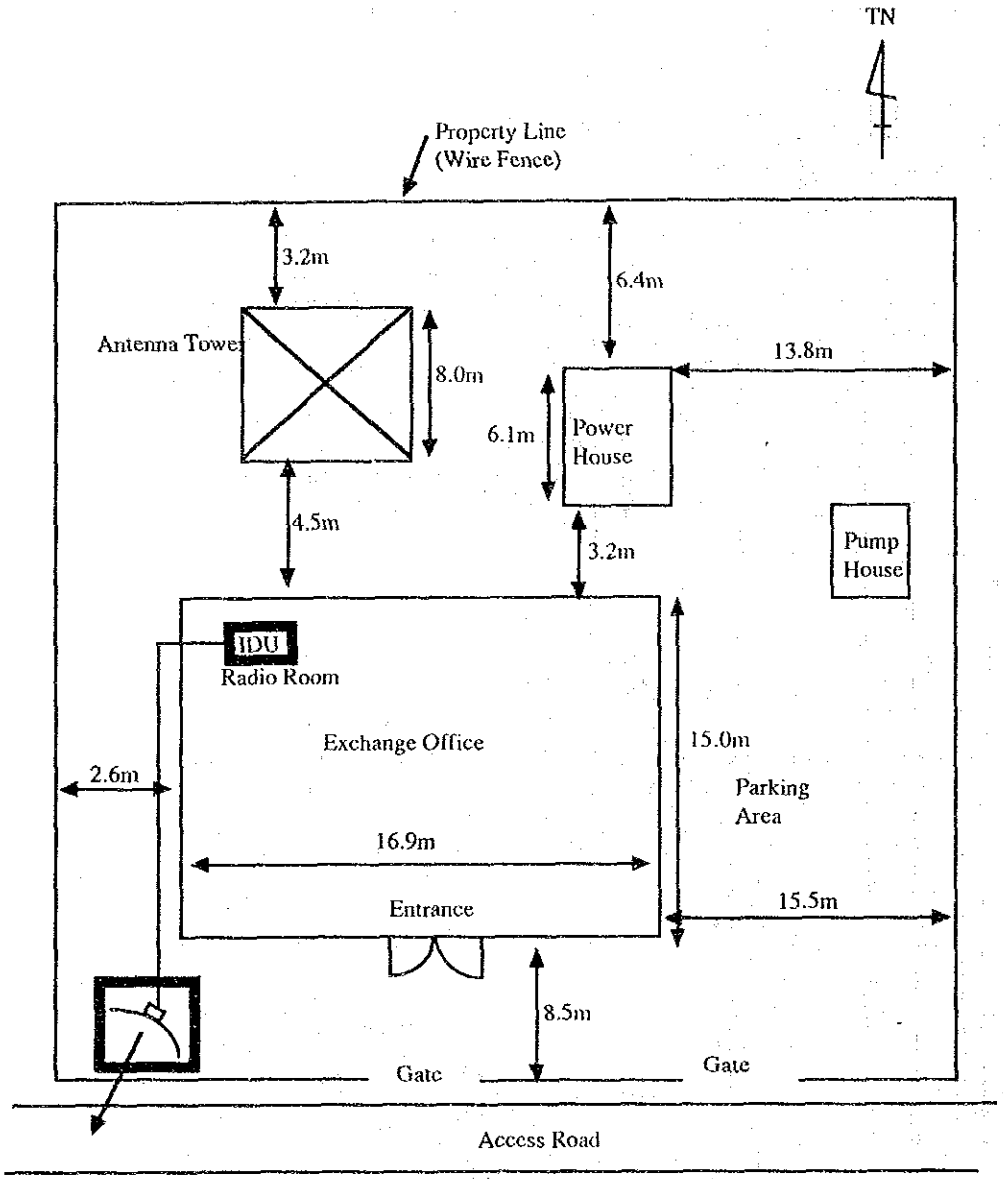


First Floor

Guide Map (Lingayen-1/3,Region I)

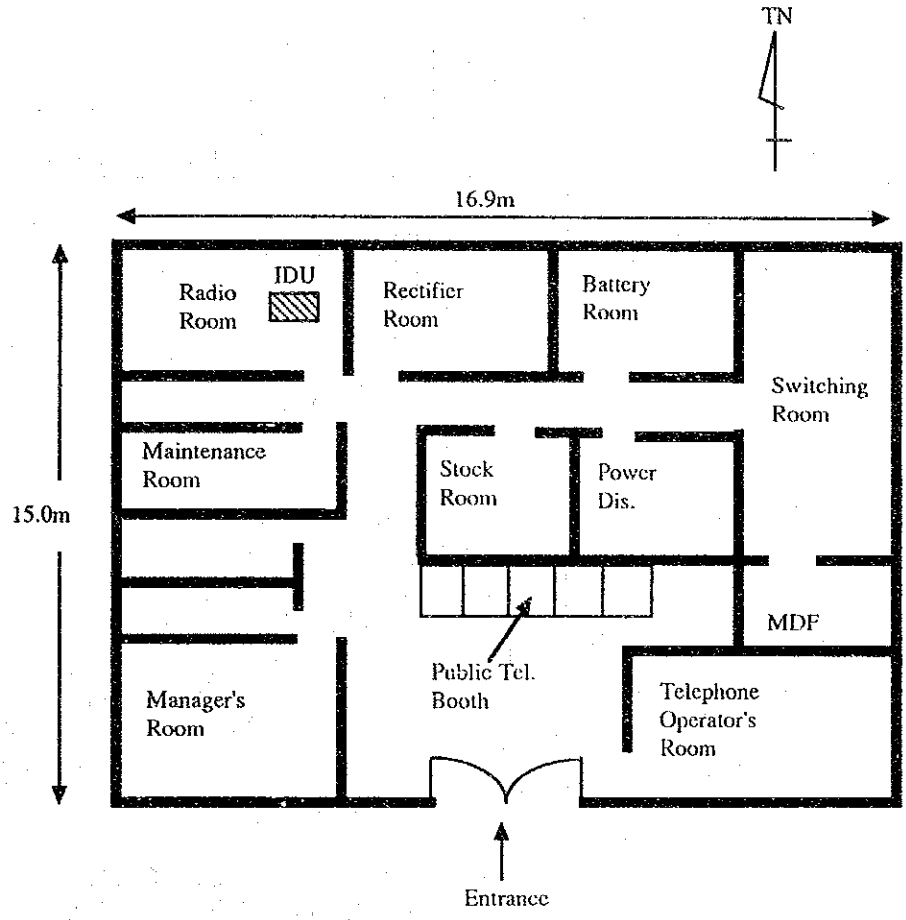


Site Layout (Lingayen-2/3,Region I)



Azimuth : 204.7°

Floor Layout (Lingayen-3/3,Region I)



TELOF Telephone & Message Center

Guide Map (S.Fernando-1/3,Region I)