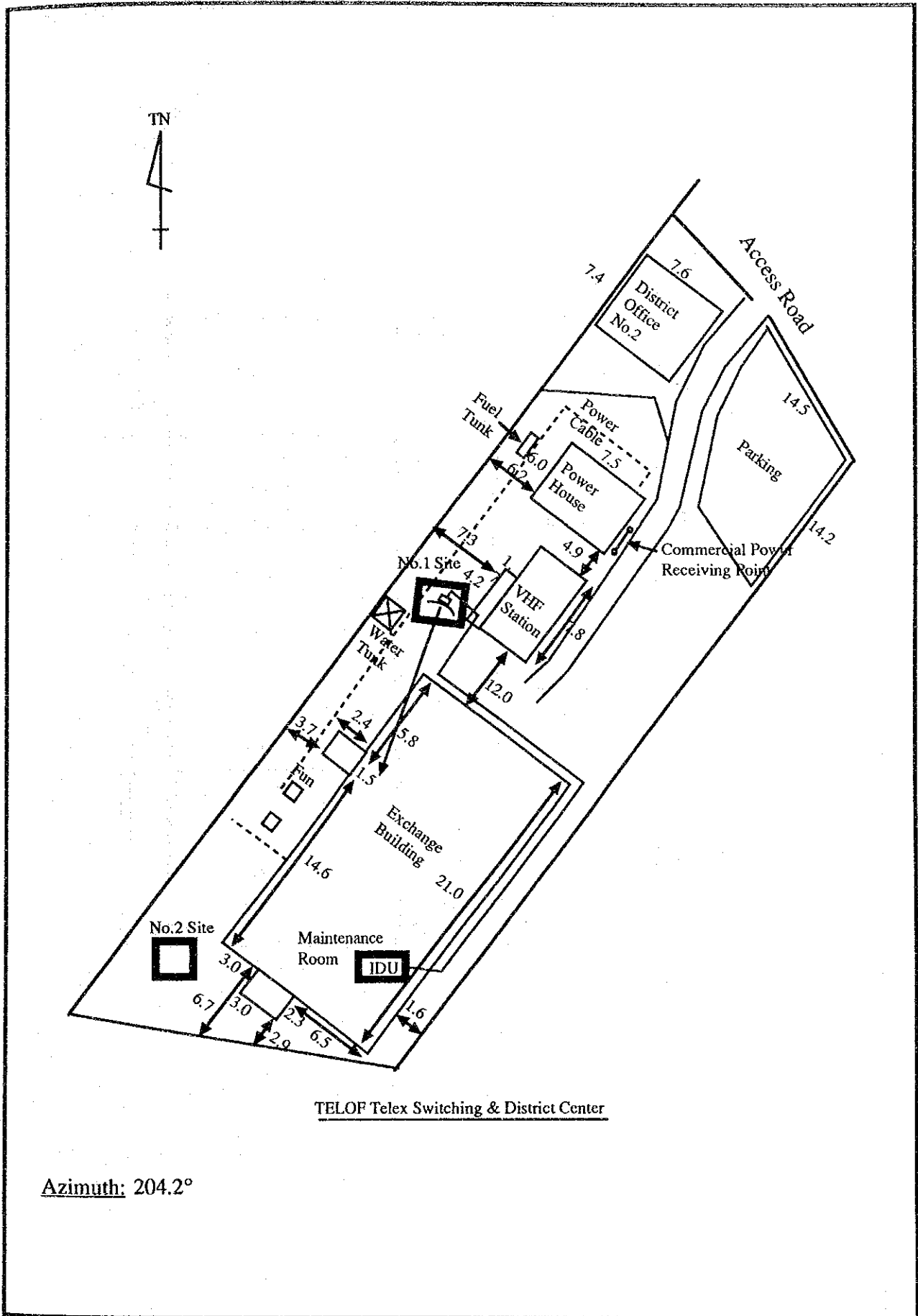


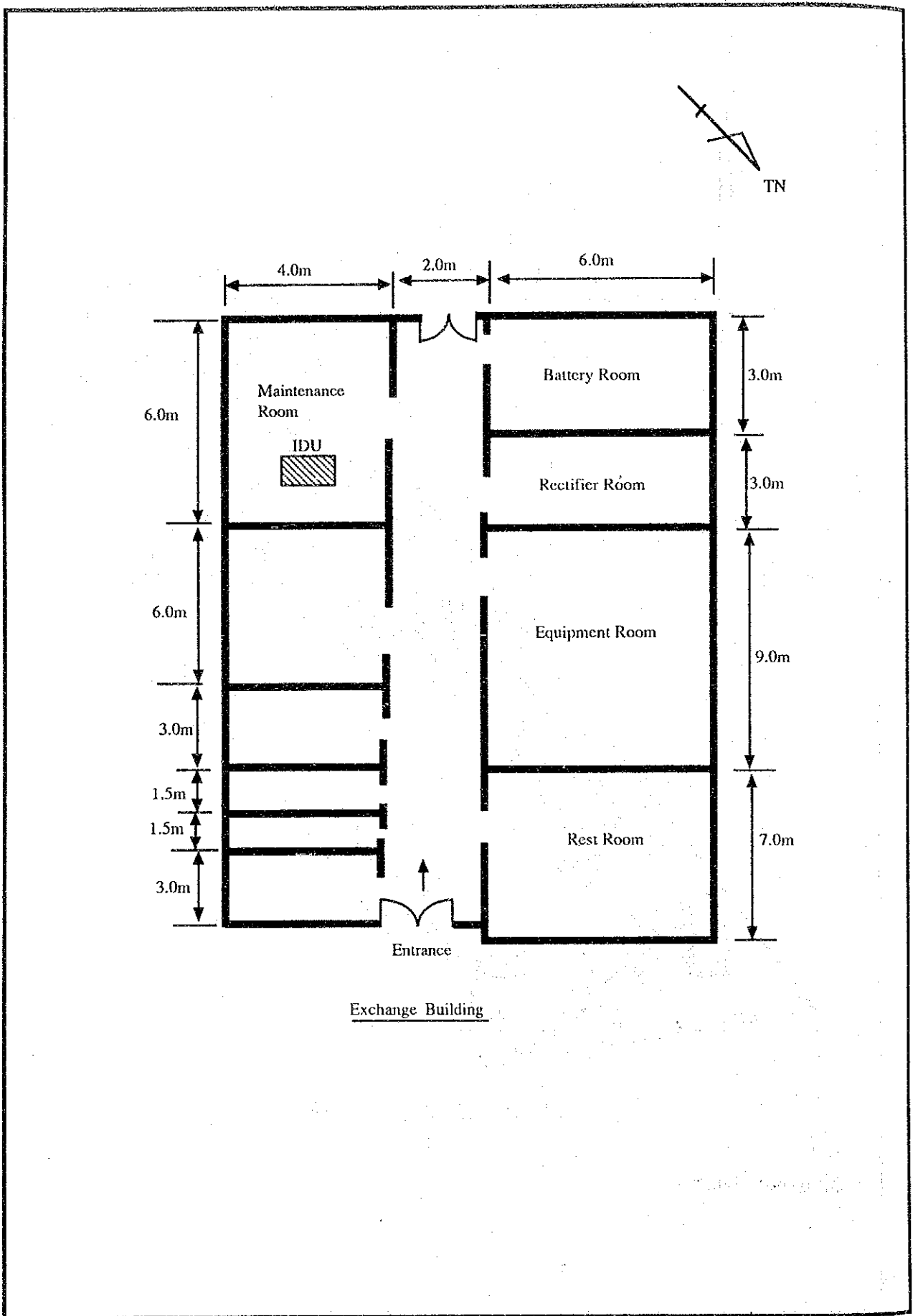
Site Layout (S.Fernando-2/3,Region I)



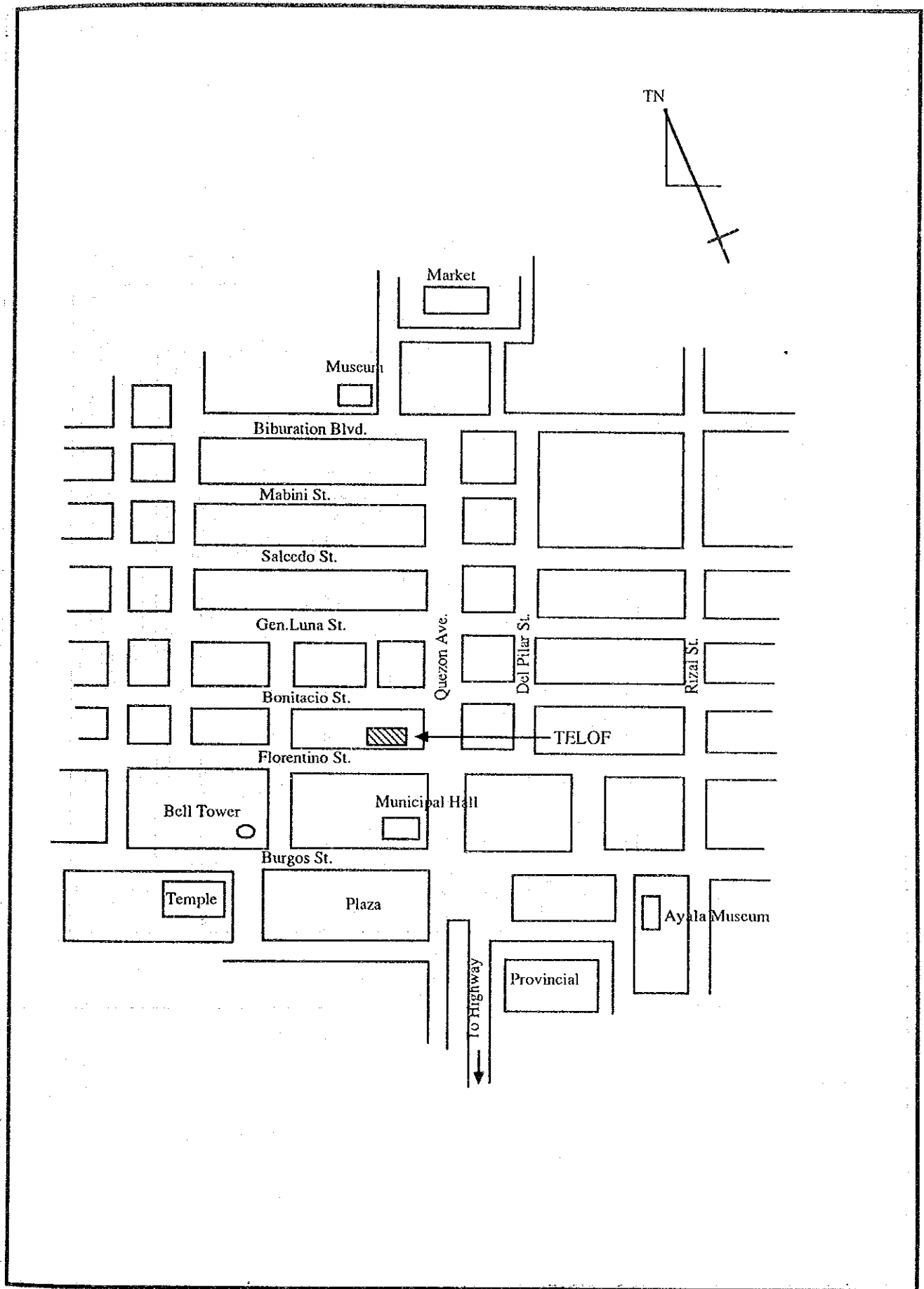
TELOF Telex Switching & District Center

Azimuth: 204.2°

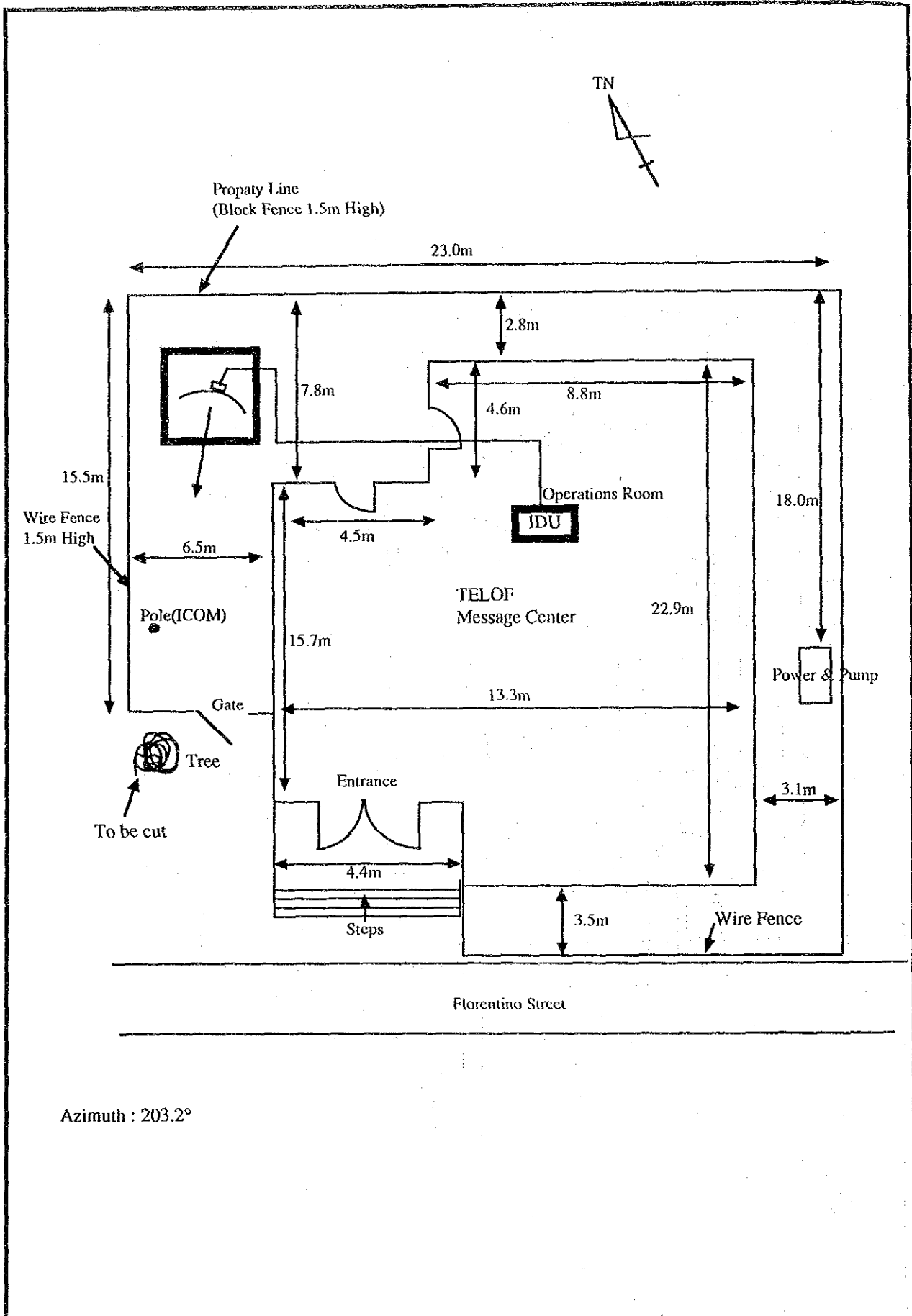
Floor Layout (S.Fernando-3/3,Region I)



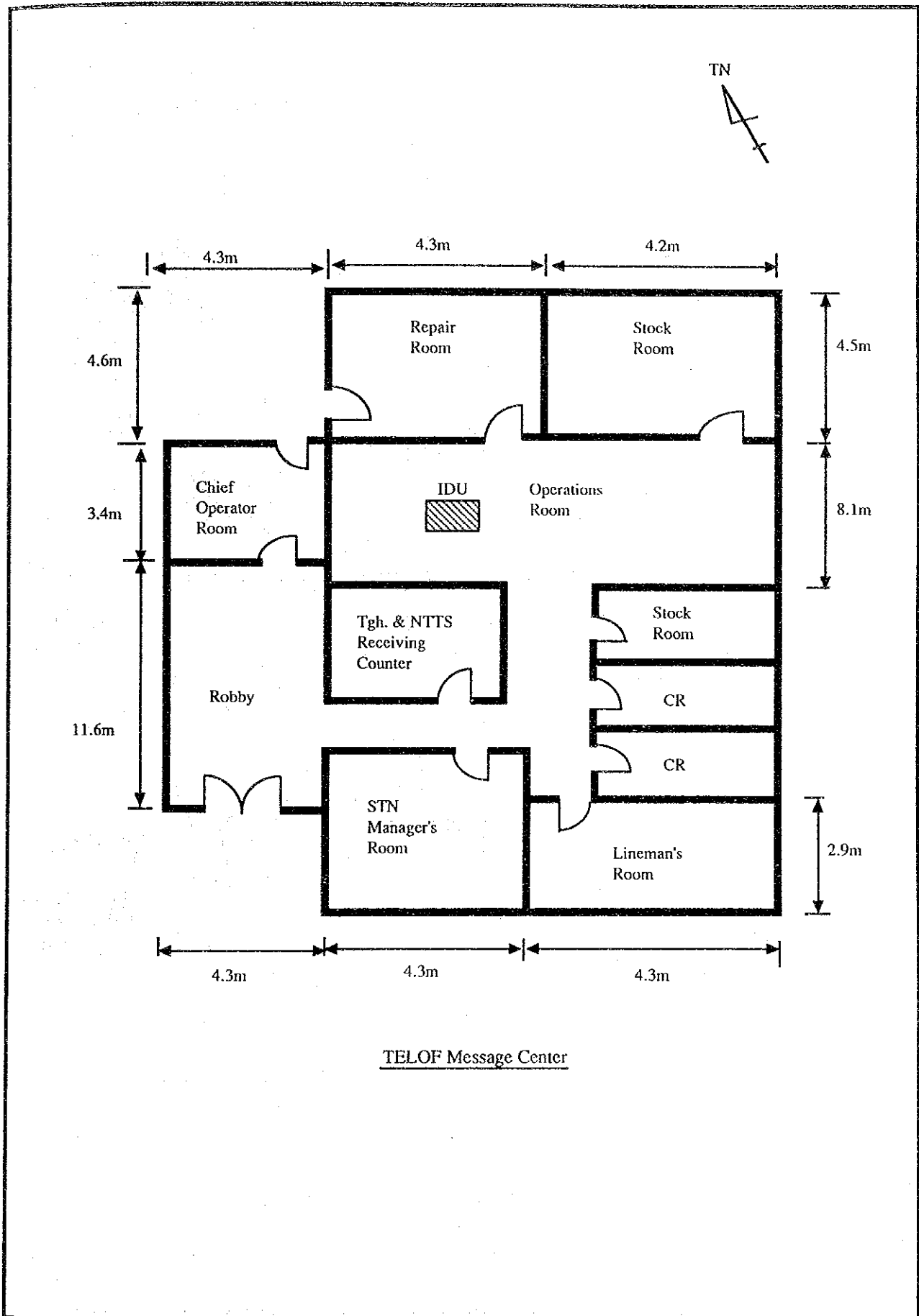
Guide Map (Vigan-1/3,Region I)



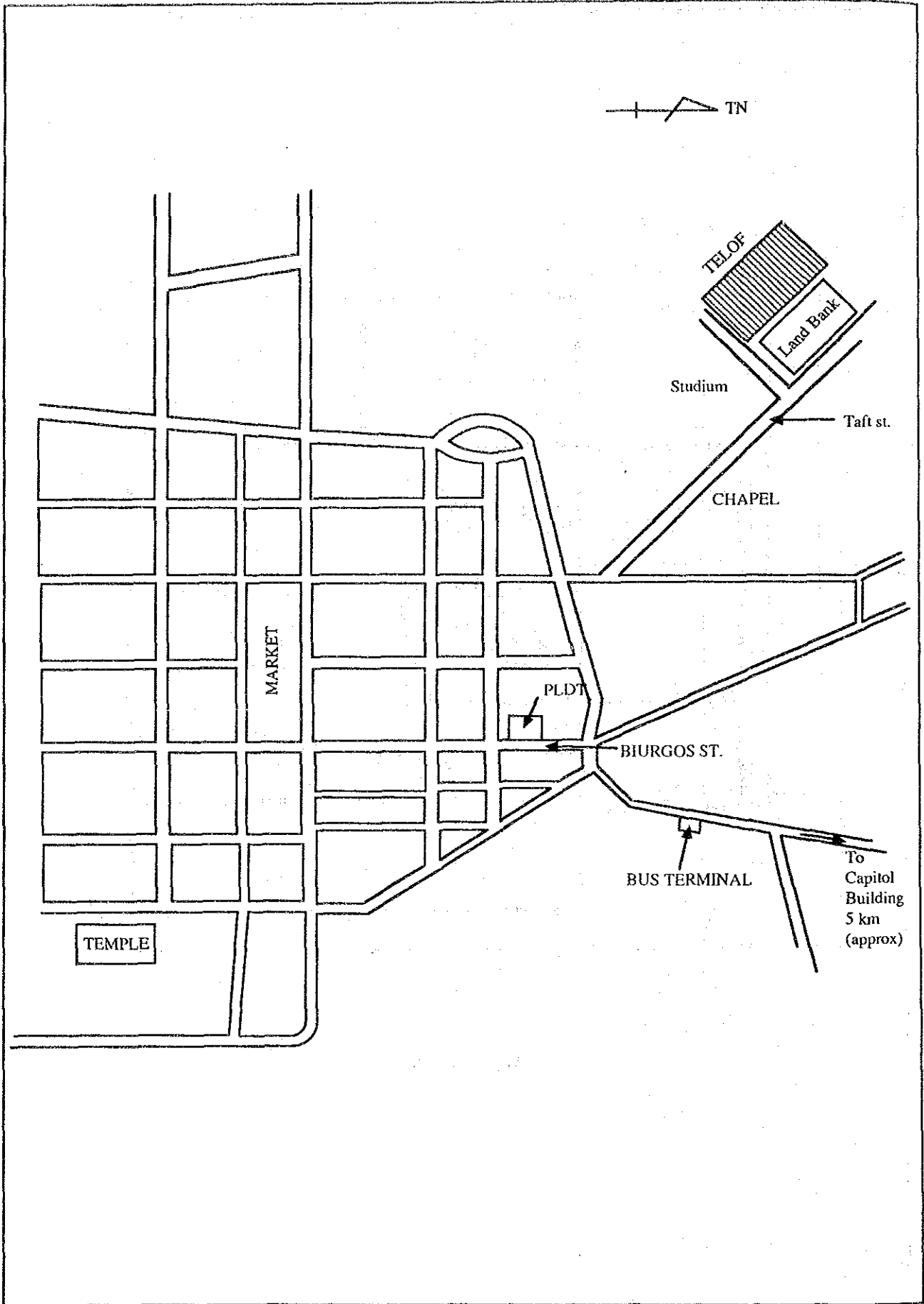
Site Layout (Vigan-2/3, Region I)



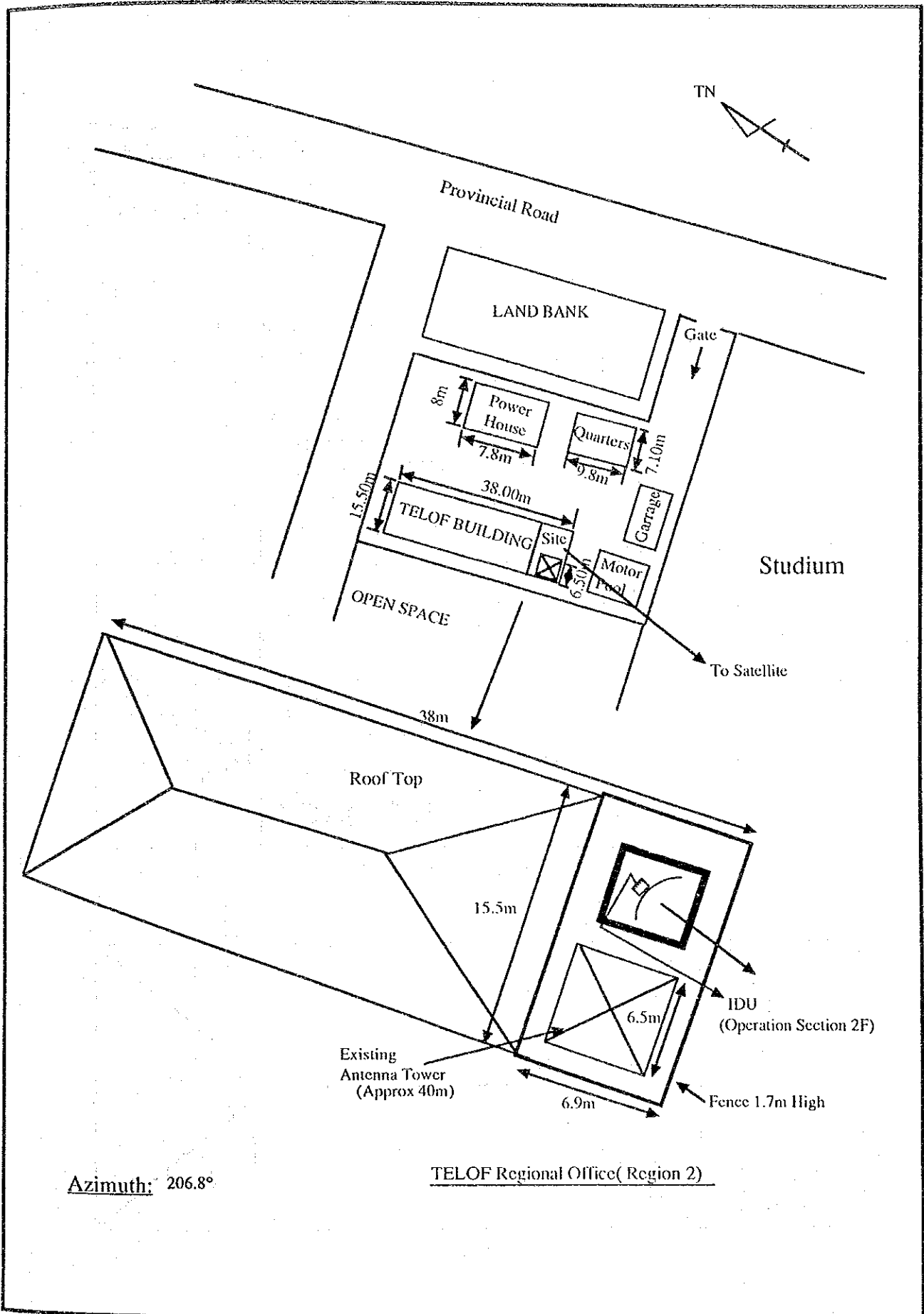
Floor Layout (Vigan-3/3, Region I)



Guide Map (Tuguegarao-1/3, Region II)



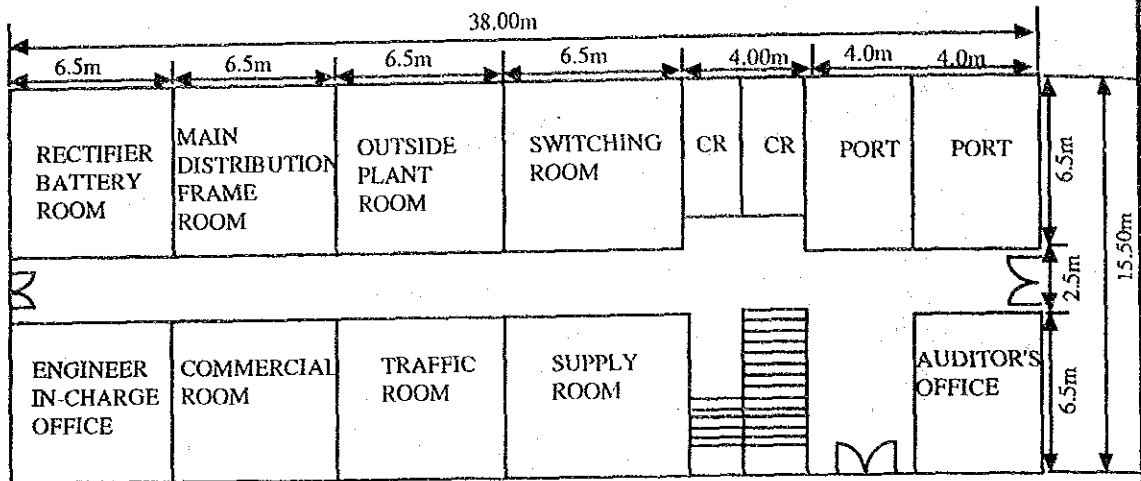
Site Layout (Tuguegarao-2/3, Region II)



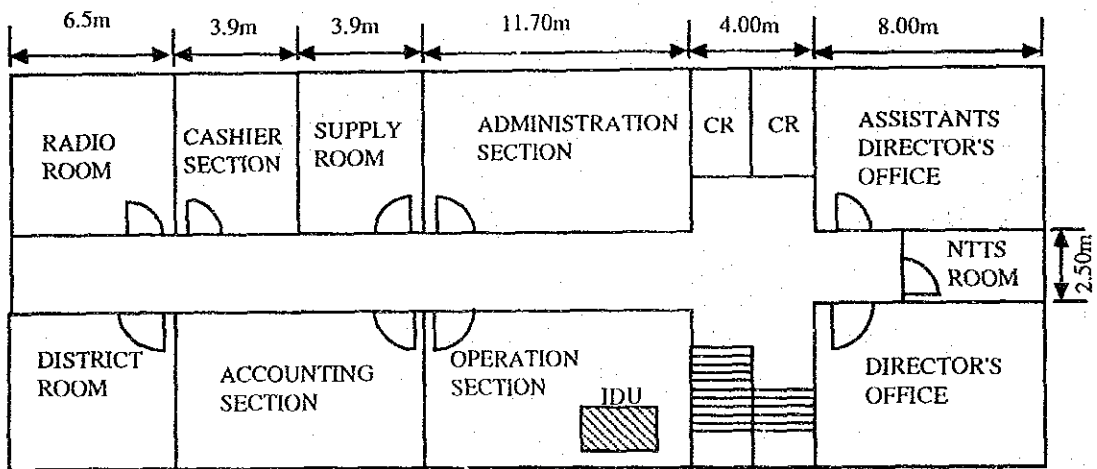
Azimuth: 206.8°

TELOF Regional Office(Region 2)

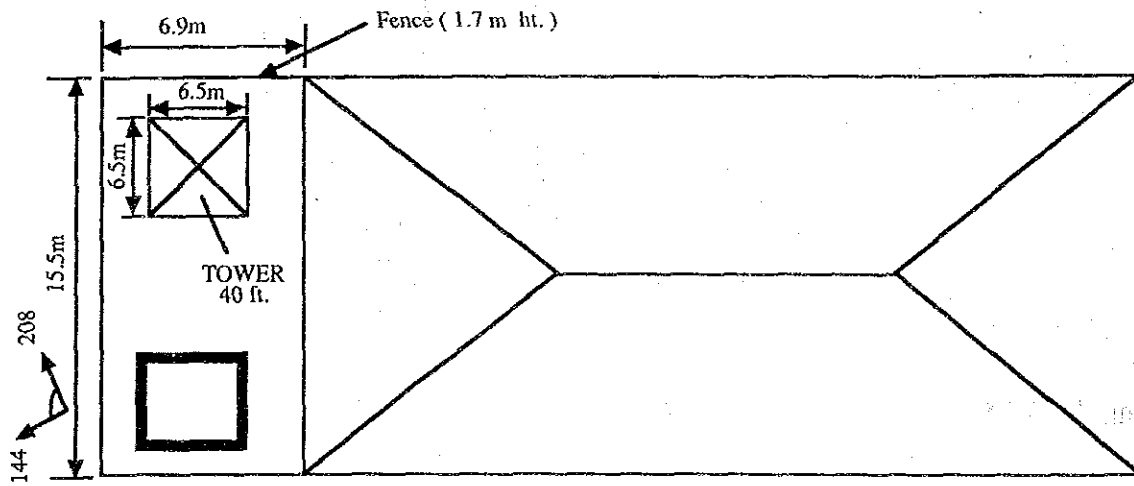
Floor Layout (Tuguegarao-3/3, Region II)



FIRST FLOOR PLAN

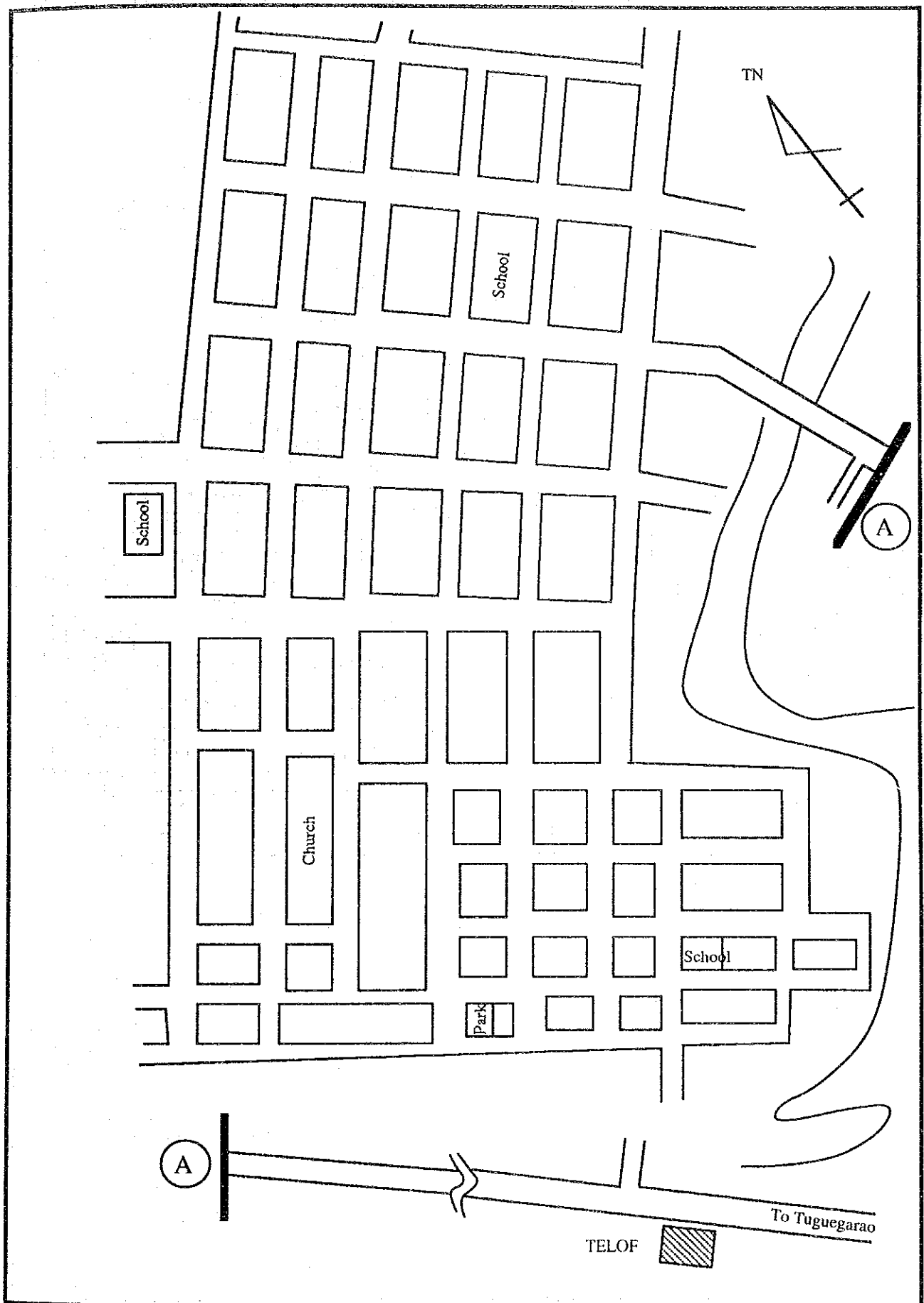


SECOND FLOOR PLAN

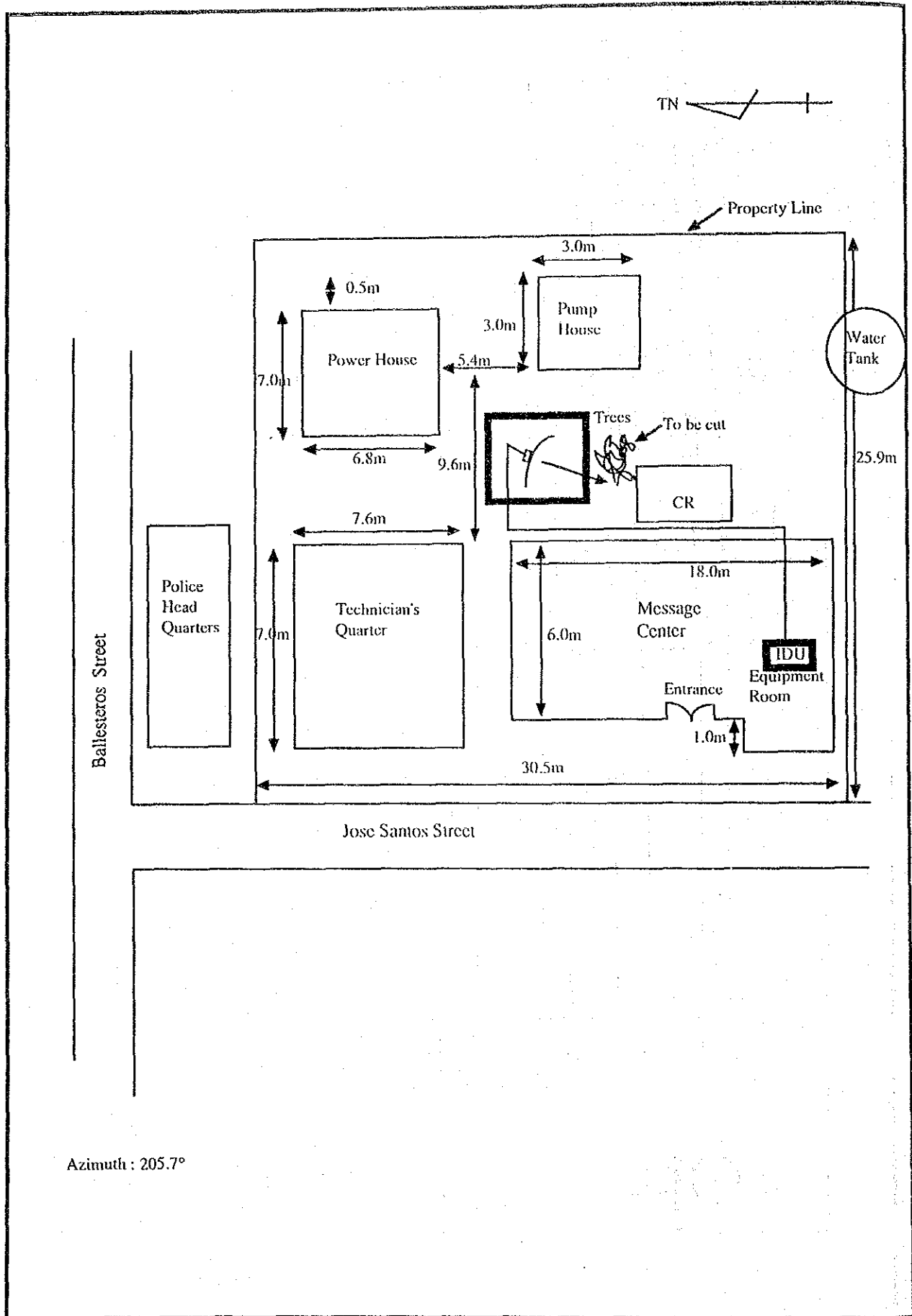


ROOF TOP

Guide Map (Aparri-1/3, Region II)



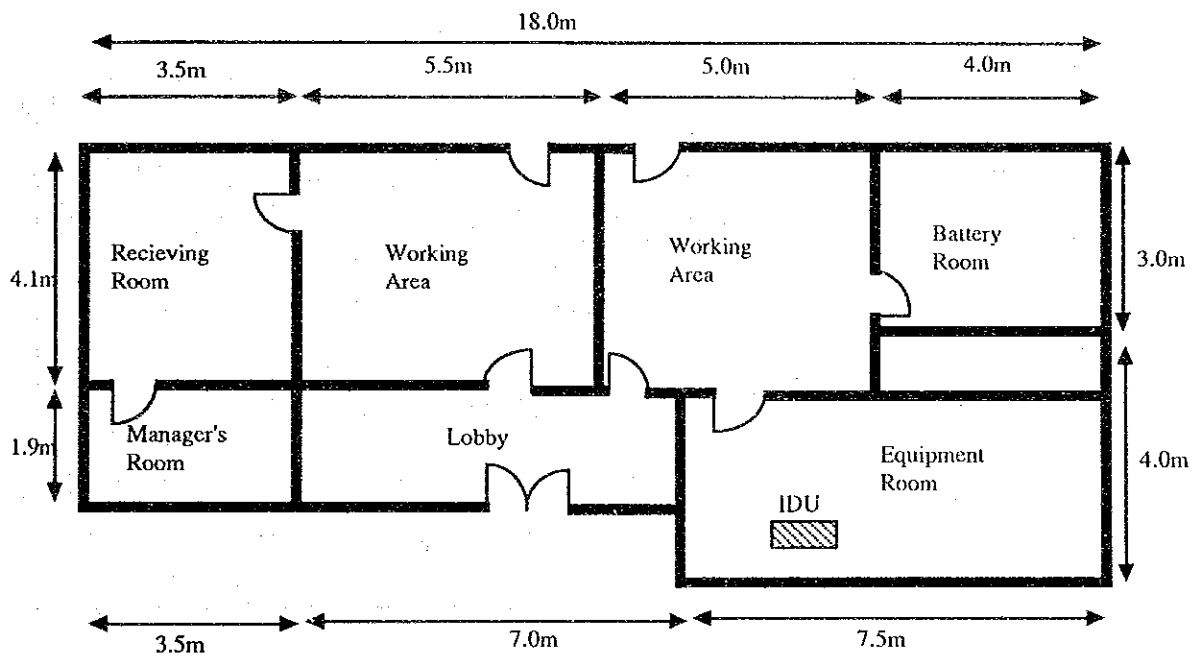
Site Layout (Aparri-2/3, Region II)



Azimuth : 205.7°

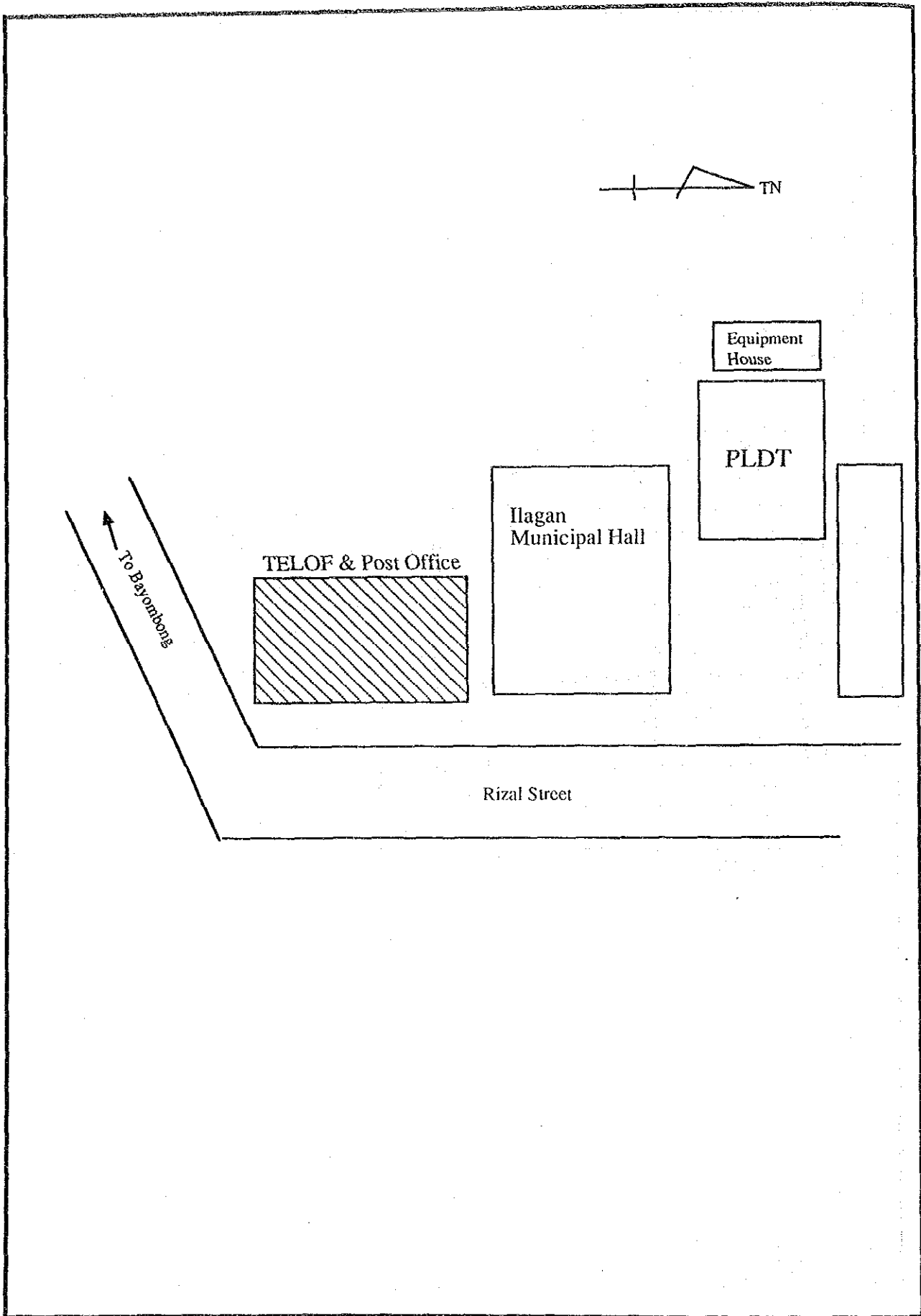
Floor Layout (Aparri-3/3, Region II)

TN 

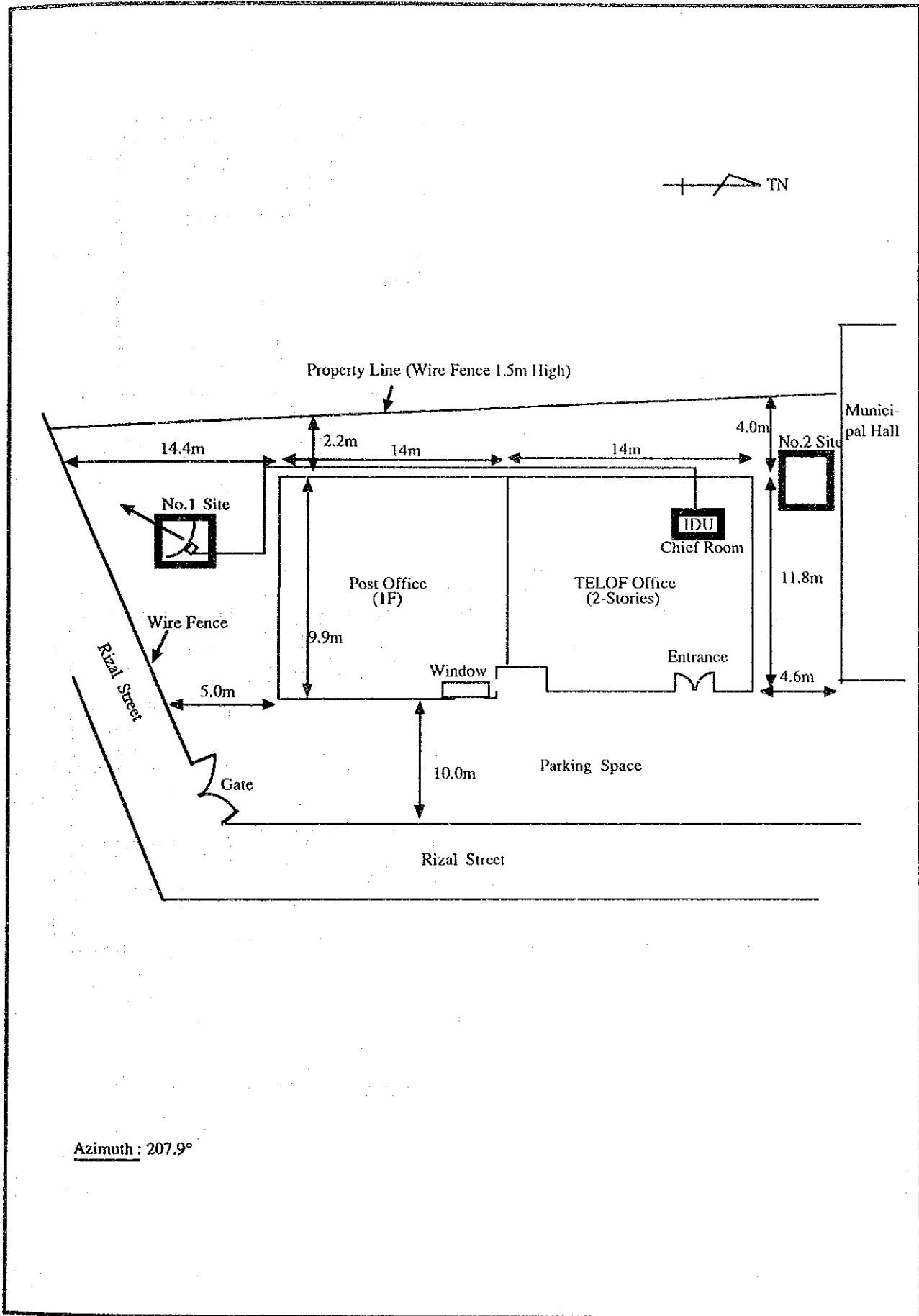


TELOF Message Center

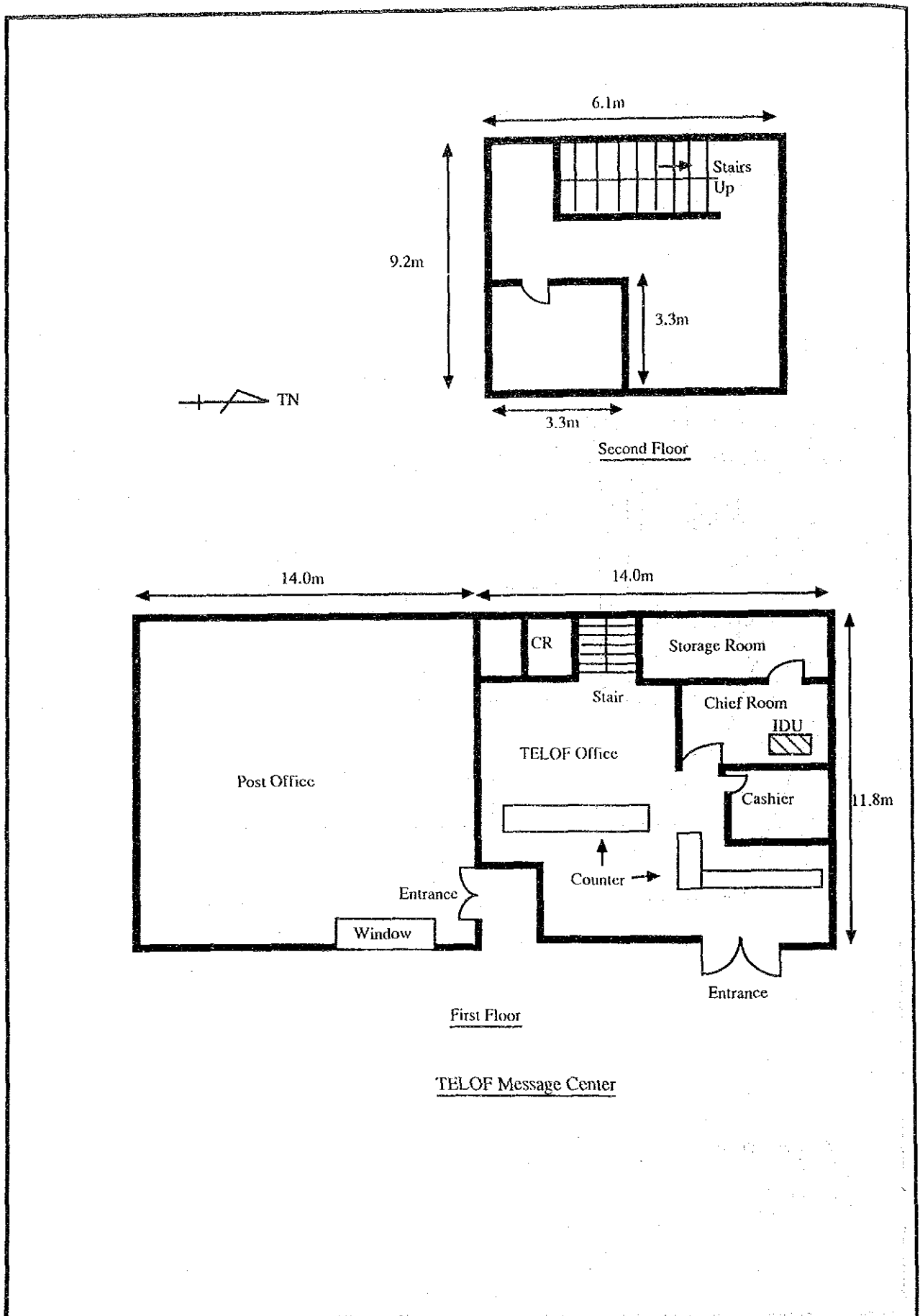
Guide Map (Ilagan-1/3, Region II)



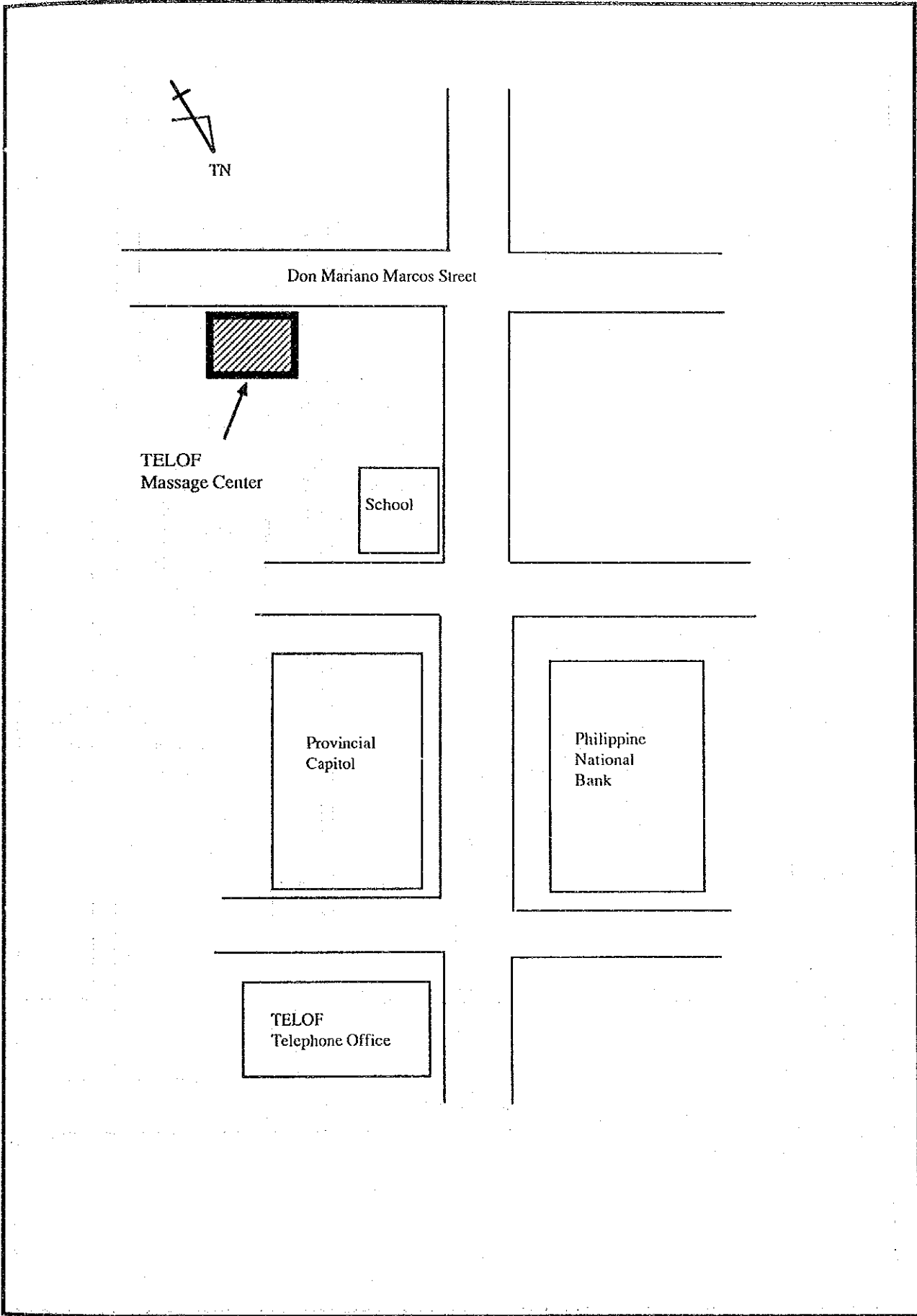
Site Layout (Ilagan-2/3, Region II)



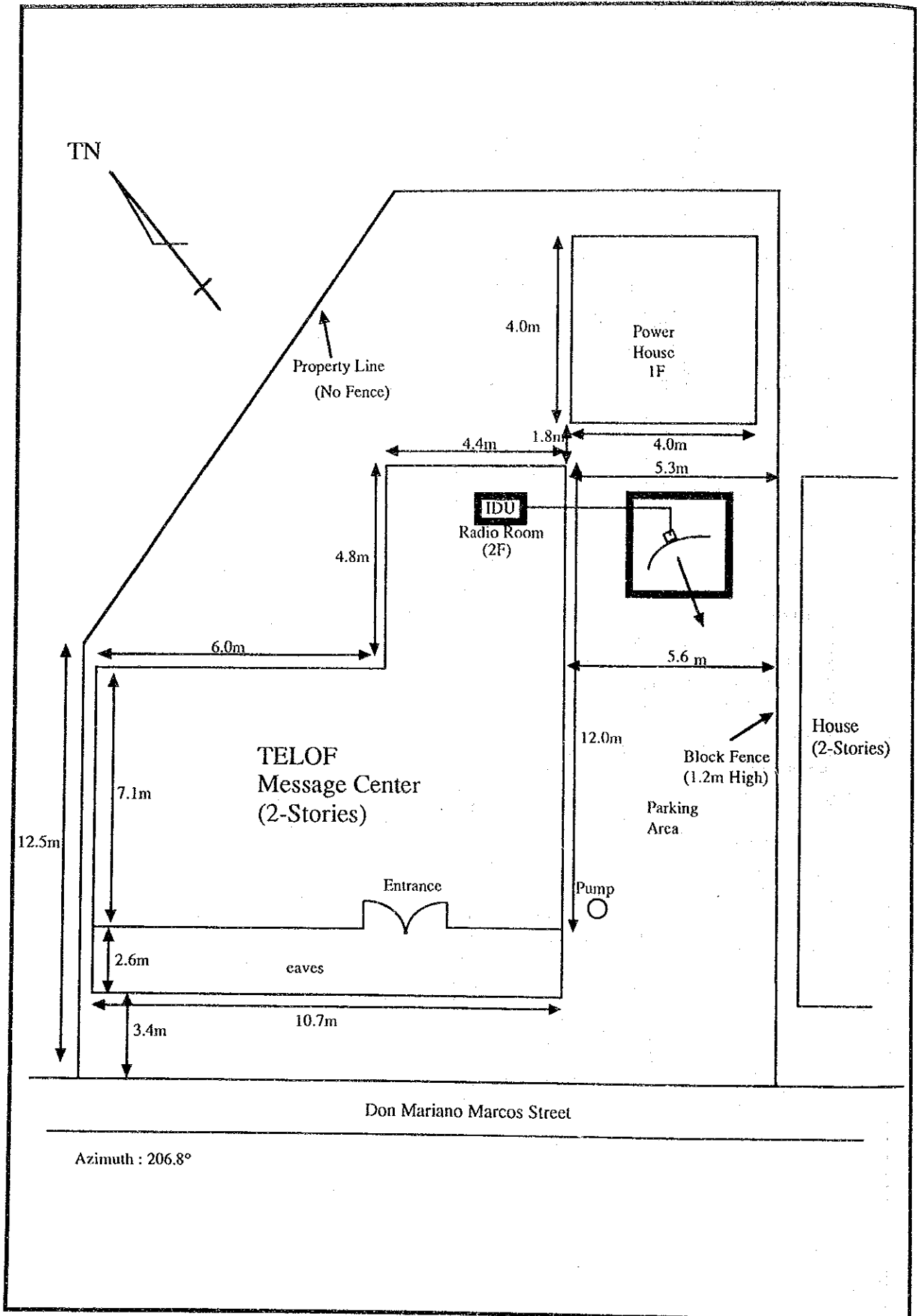
Floor Layout (Ilagan-3/3, Region II)



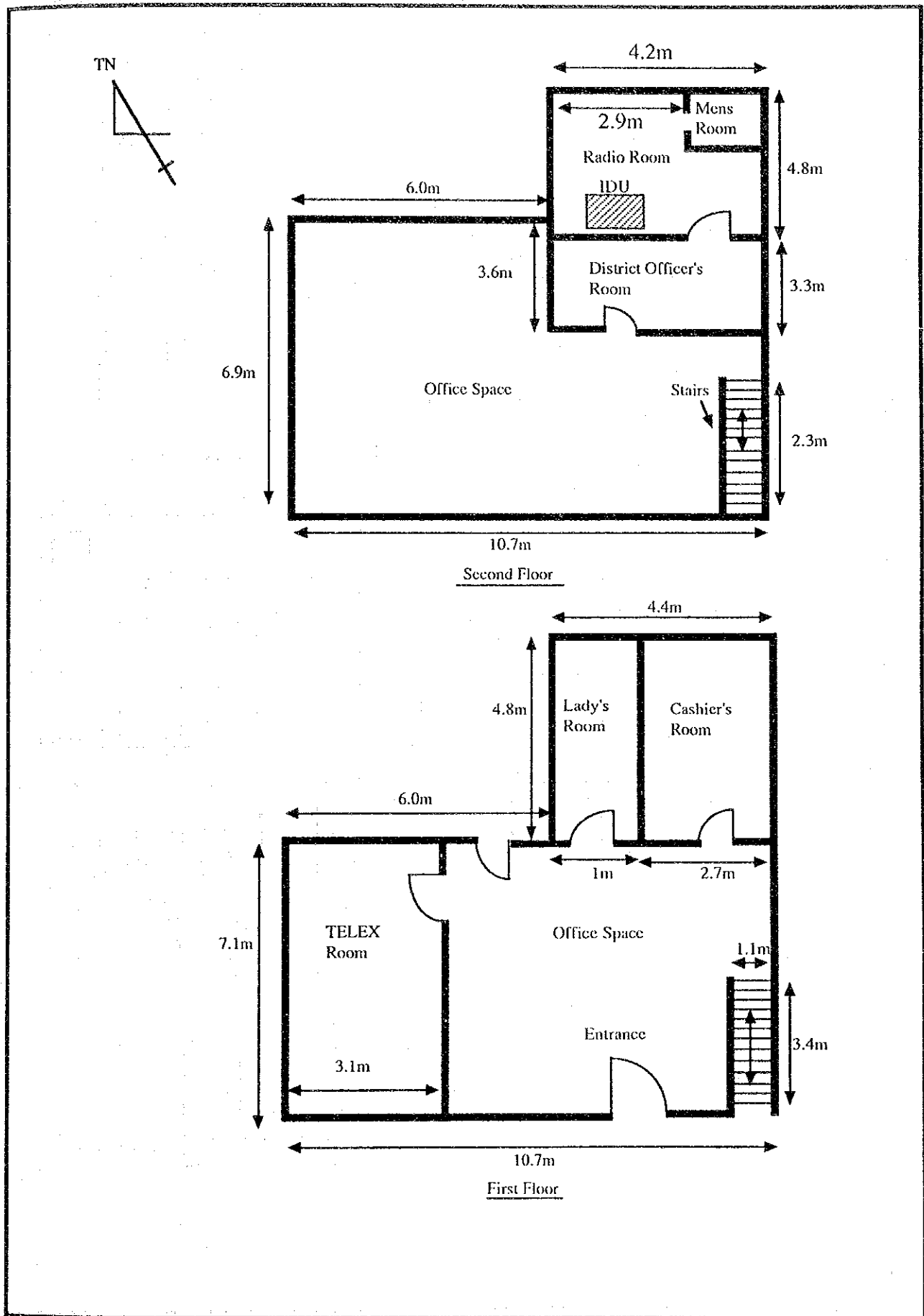
Guide Map (Bayombong-1/3,Region II)



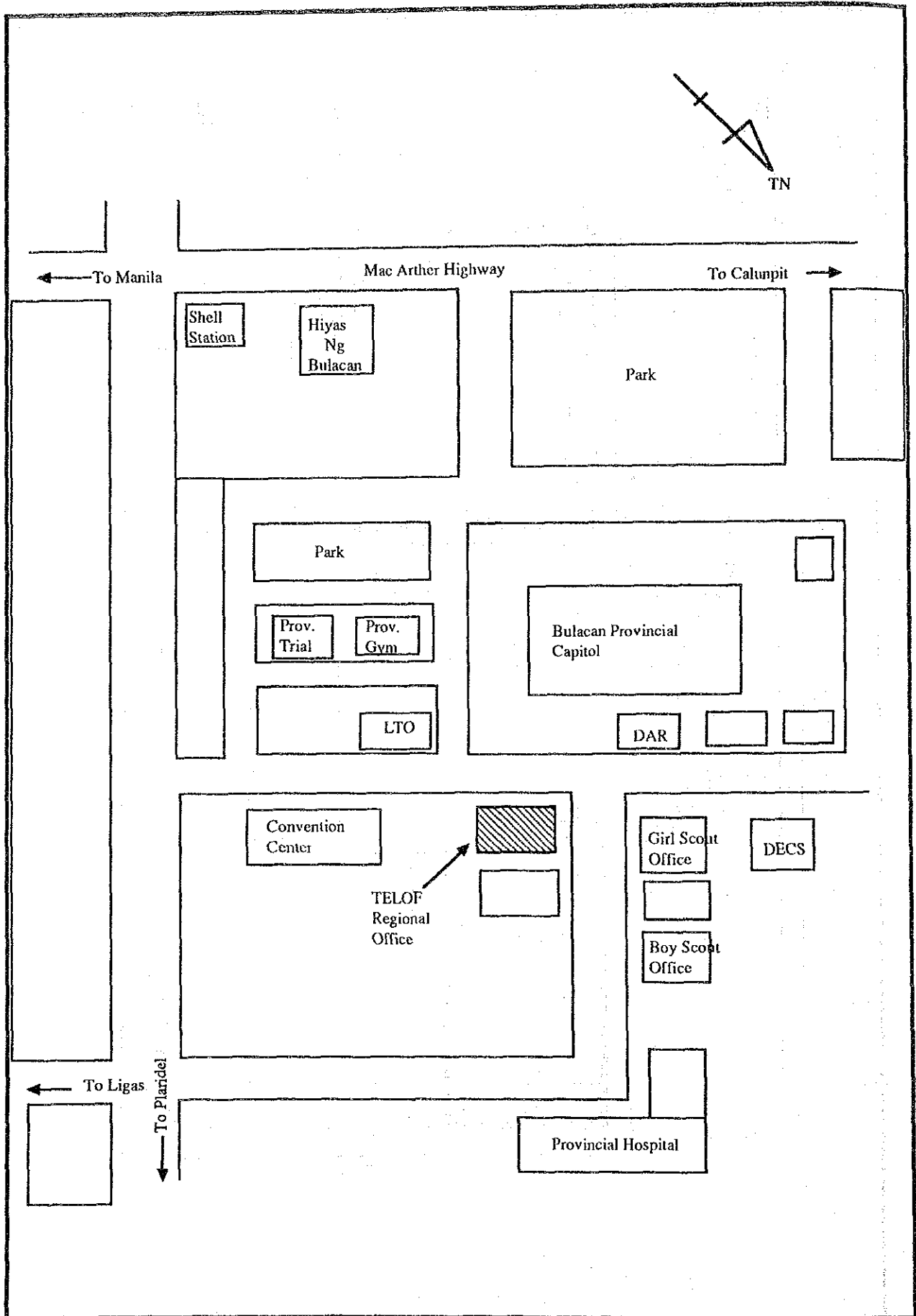
Site Layout (Bayombong-2/3, Region II)



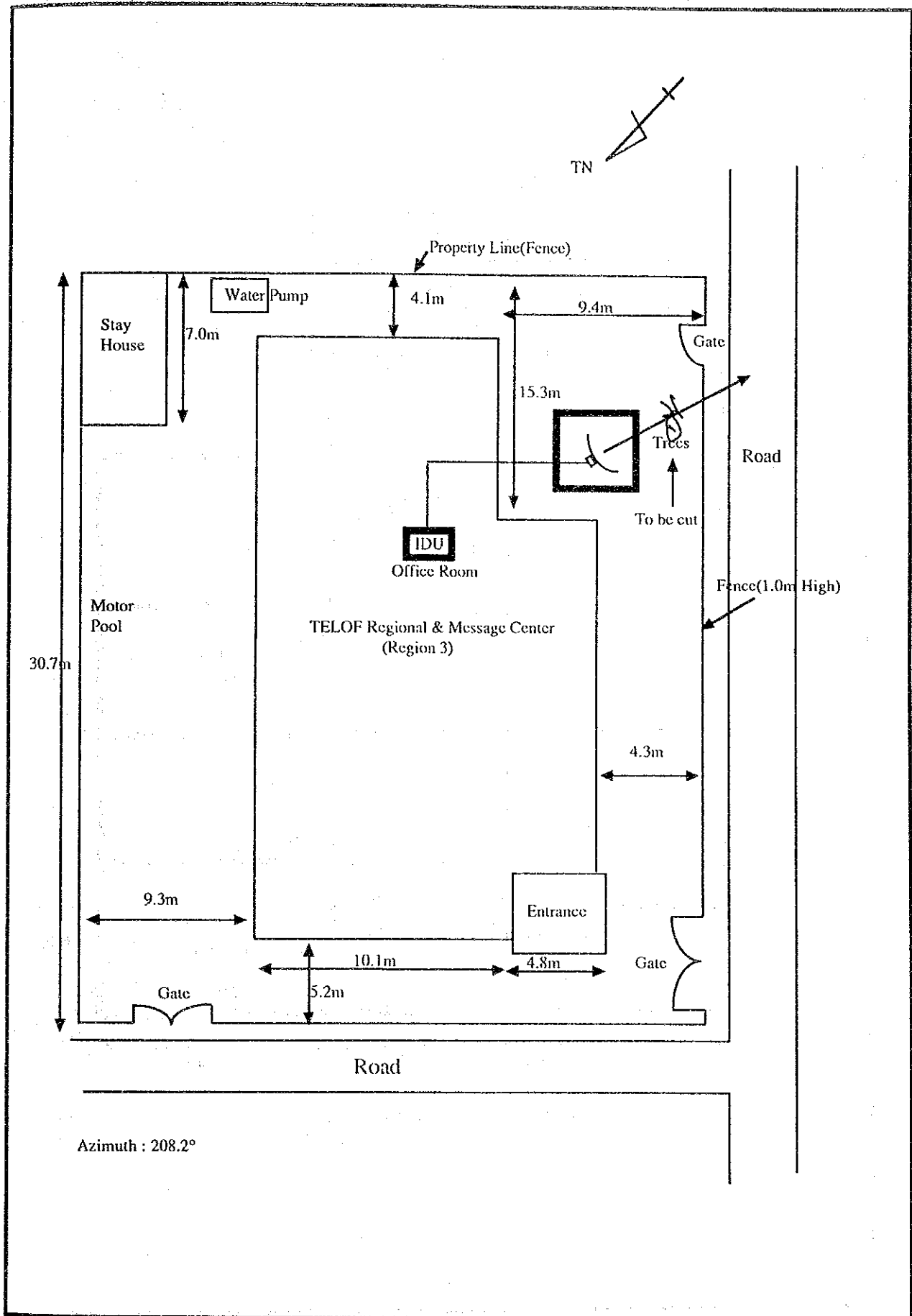
Floor Layout (Bayombong-3/3, Region II)



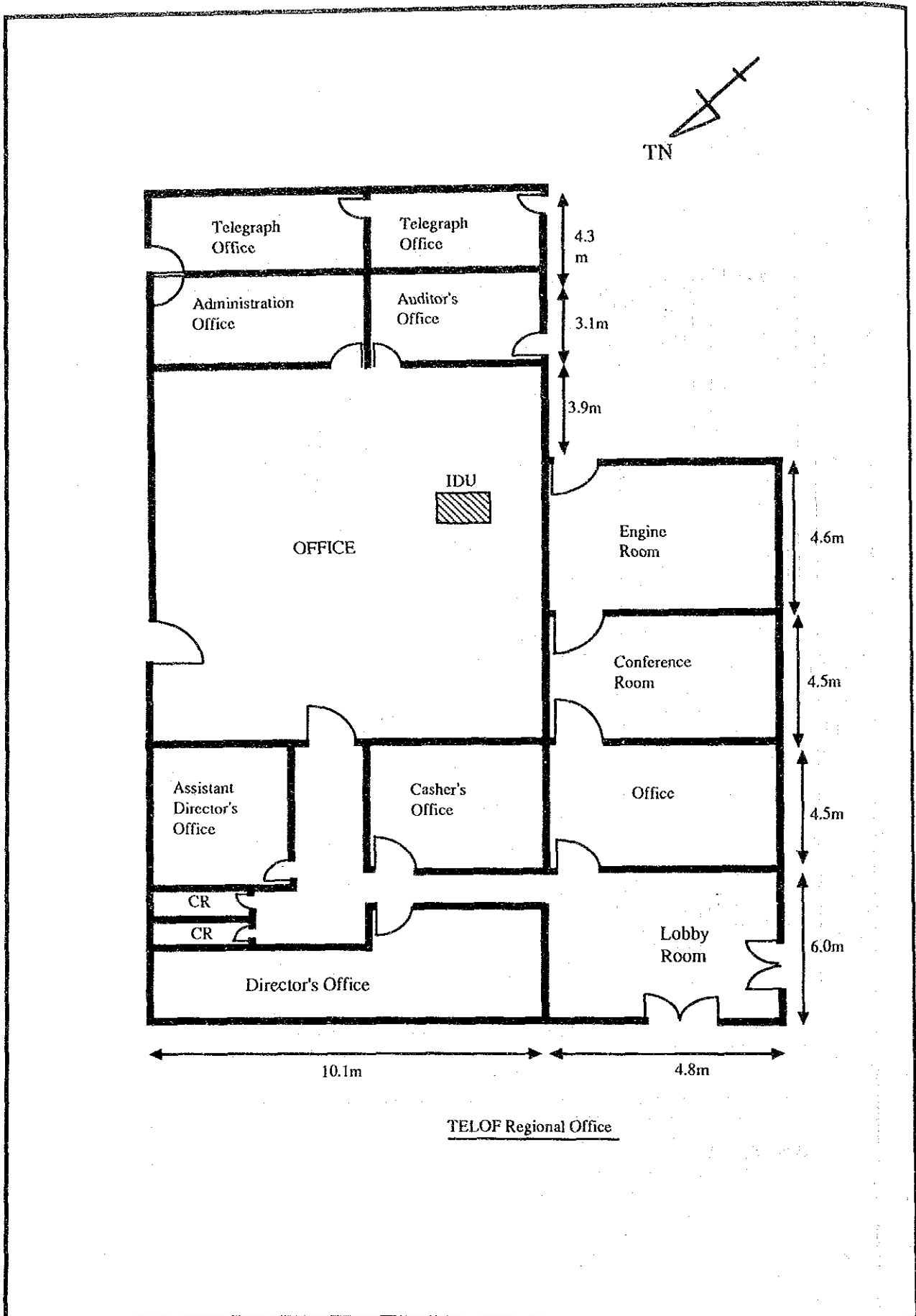
Guide Map (Malolos-1/3, Region III)



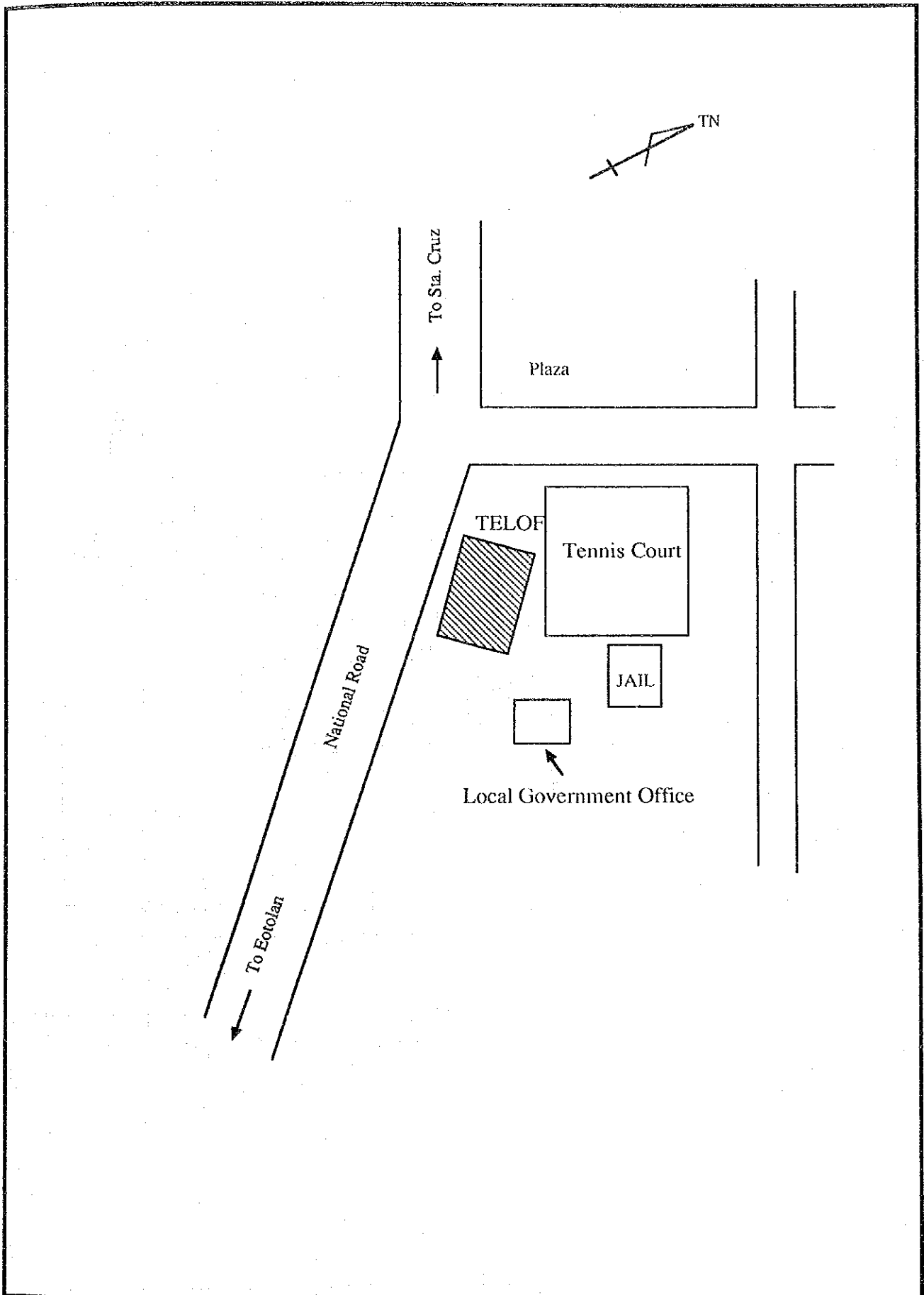
Site Layout (Malolos-2/3, Region III)



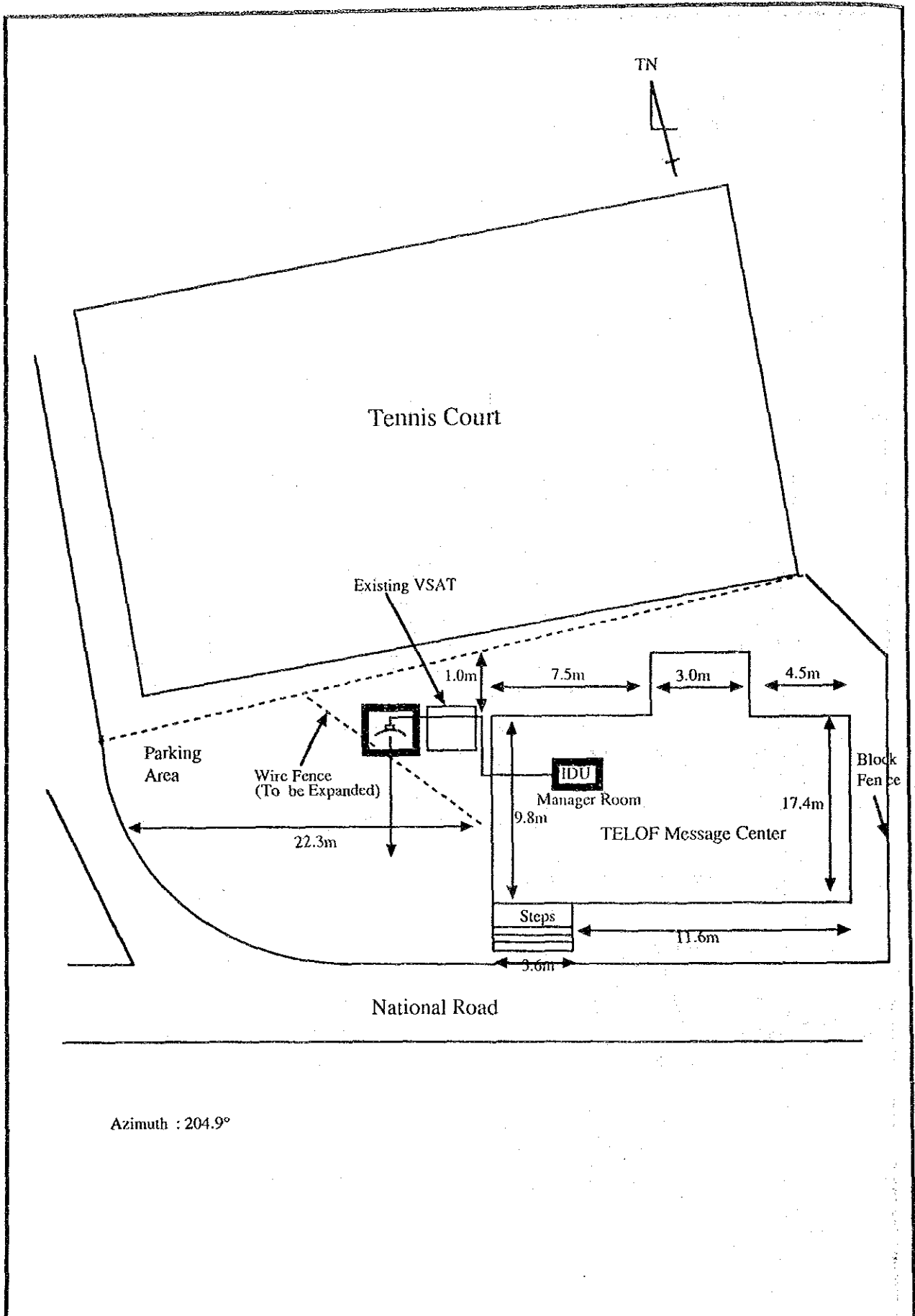
Floor Layout (Malolos-3/3, Region III)



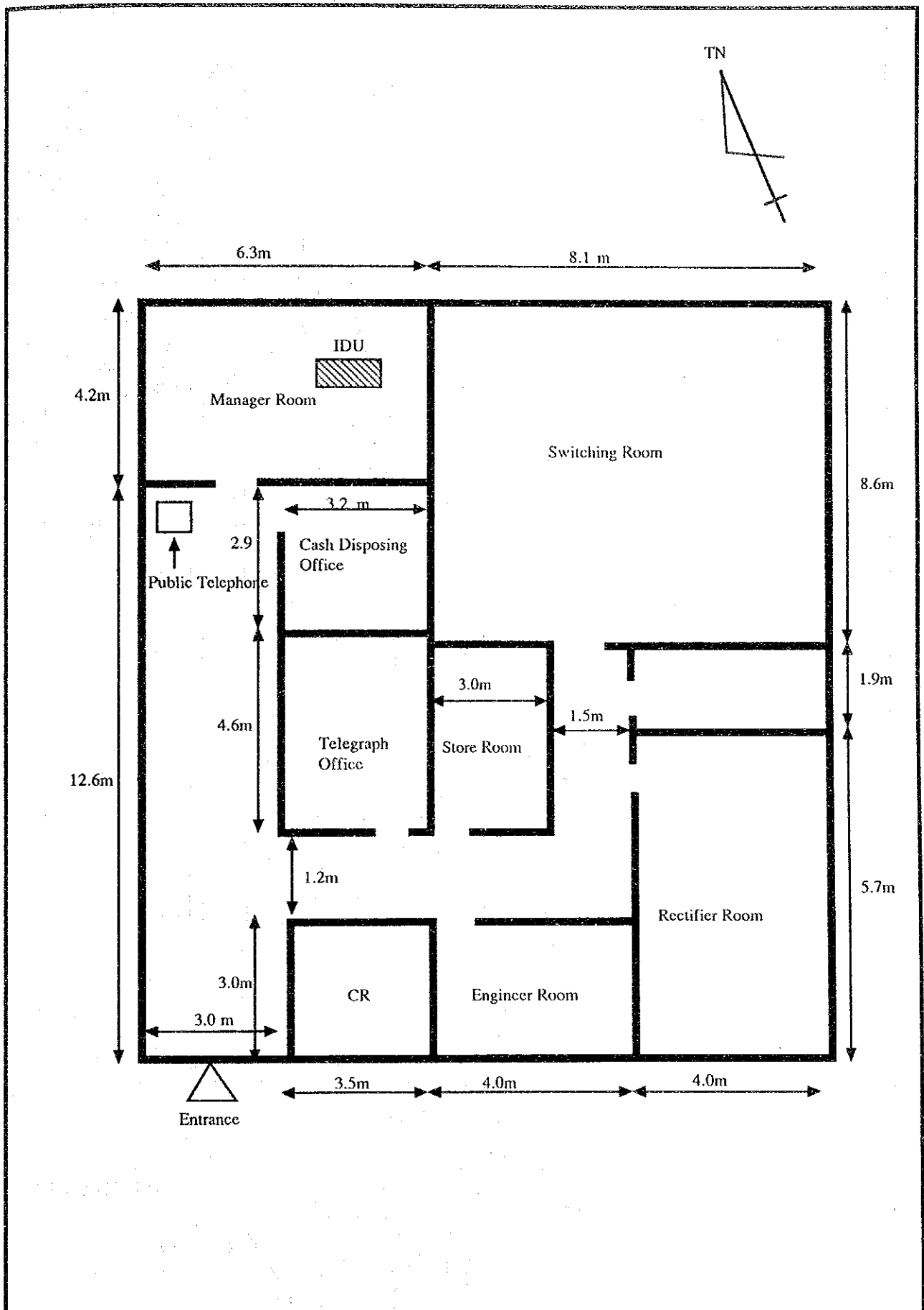
Guide Map (Iba-1/3, Region III)



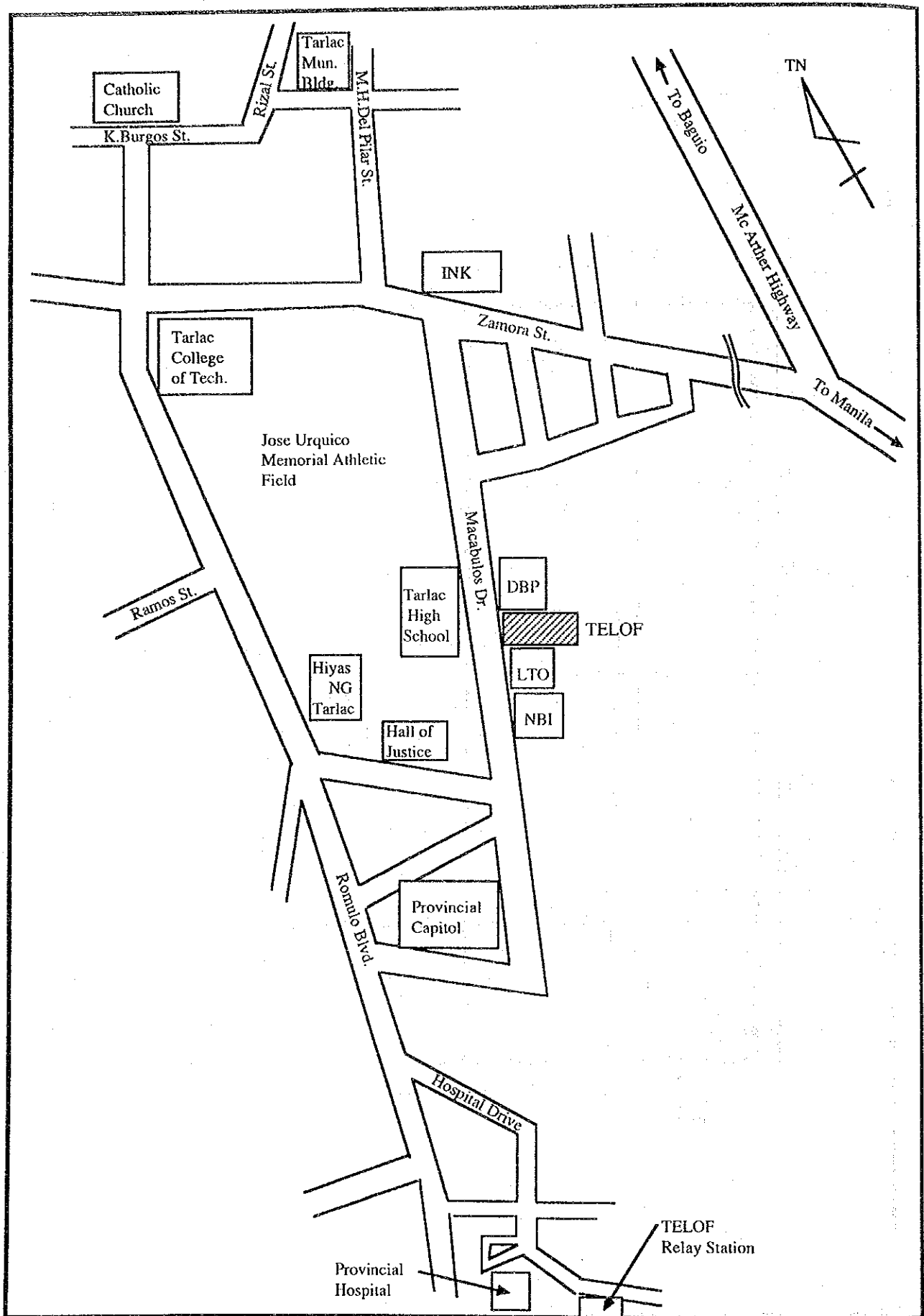
Site Layout (Iba-2/3, Region III)



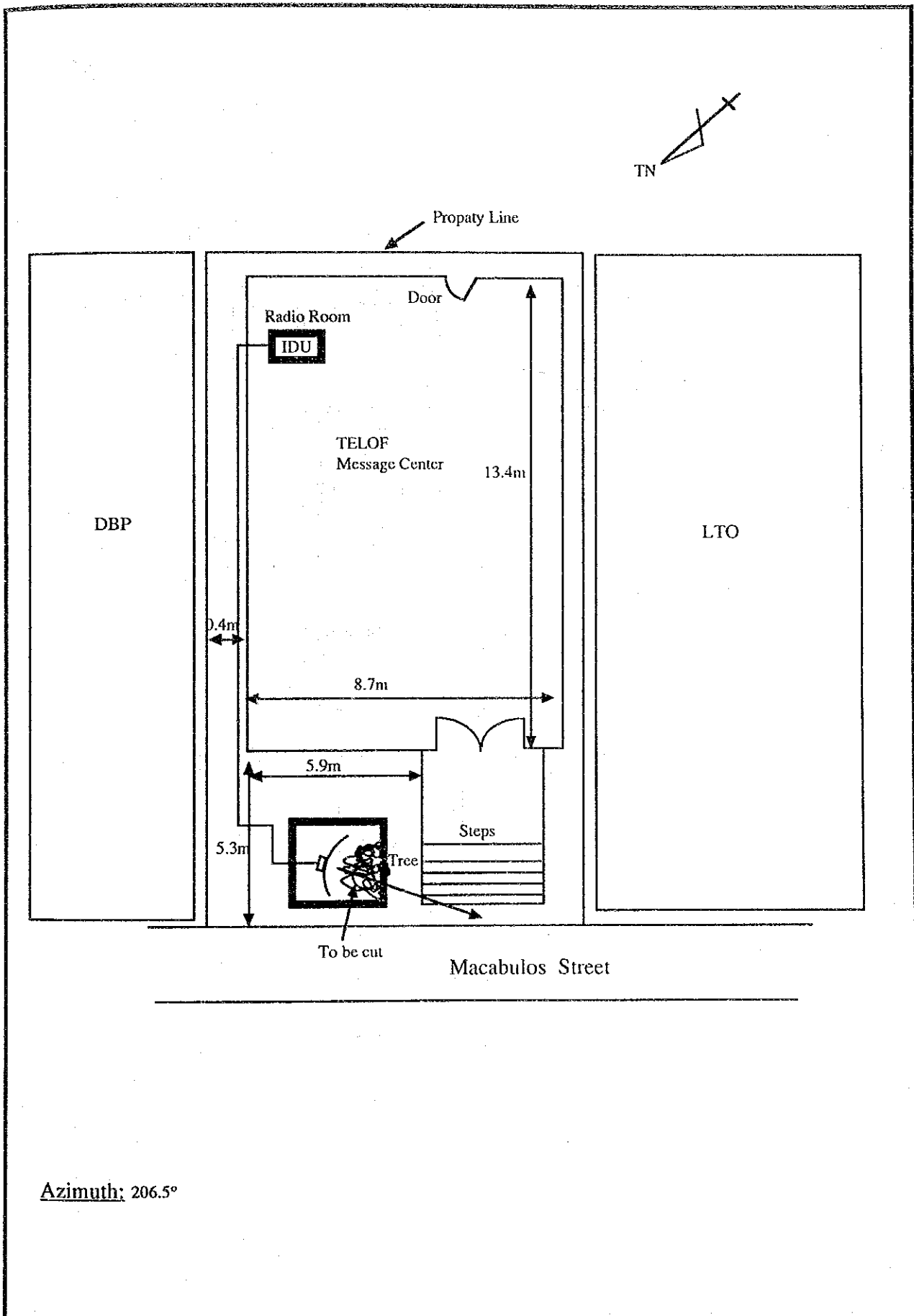
Floor Layout (Iba-3/3, Region III)



Guide Map (Tarlac-1/3, Region III)

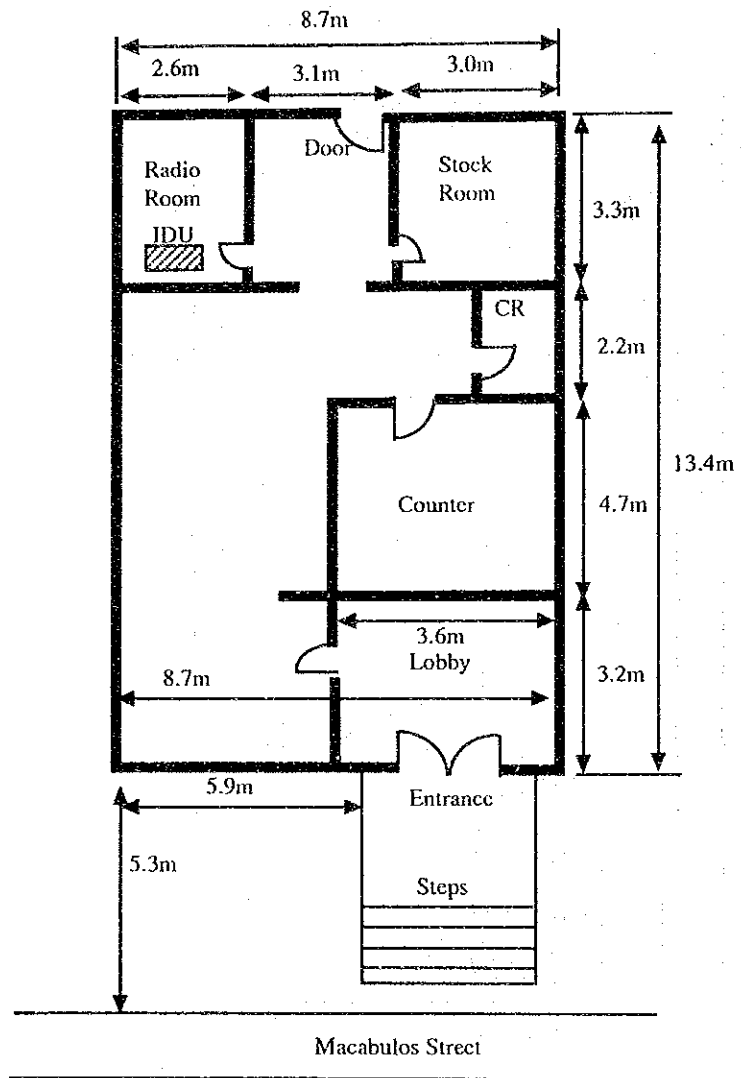
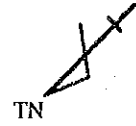


Site Layout (Tarlac-2/3, Region III)



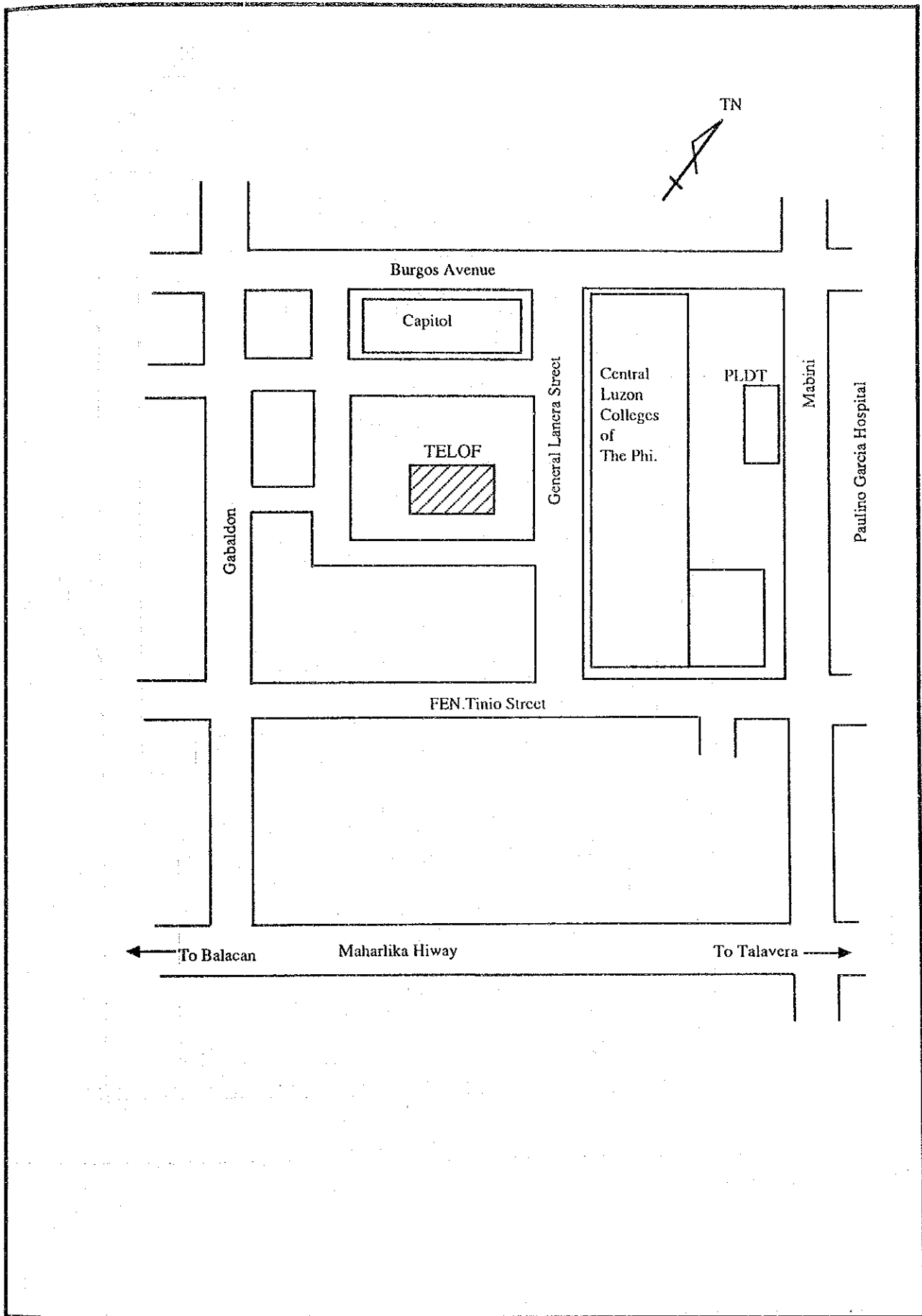
Azimuth: 206.5°

Floor Layout (Tarlac-3/3, Region III)

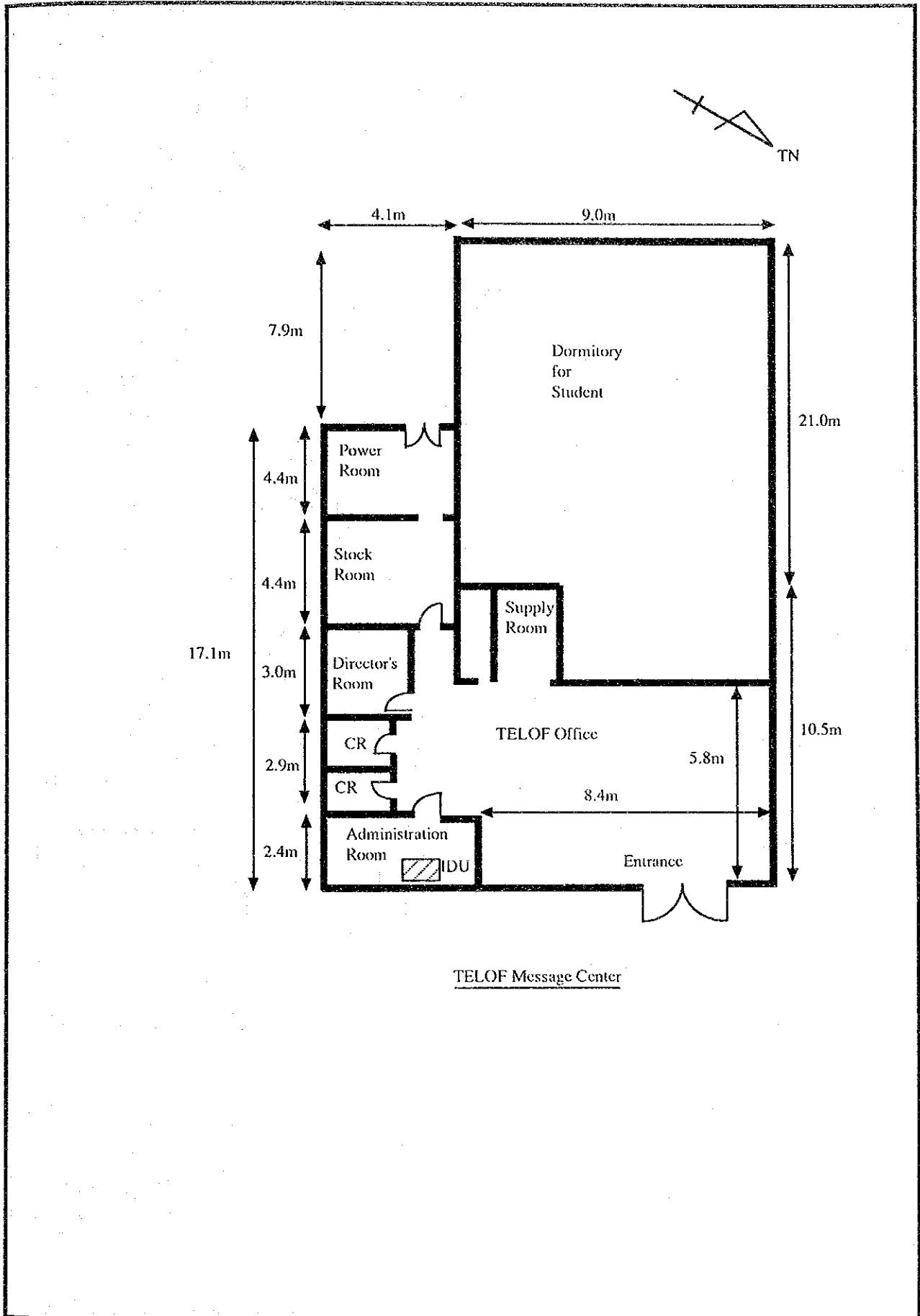


TELOF Message Center

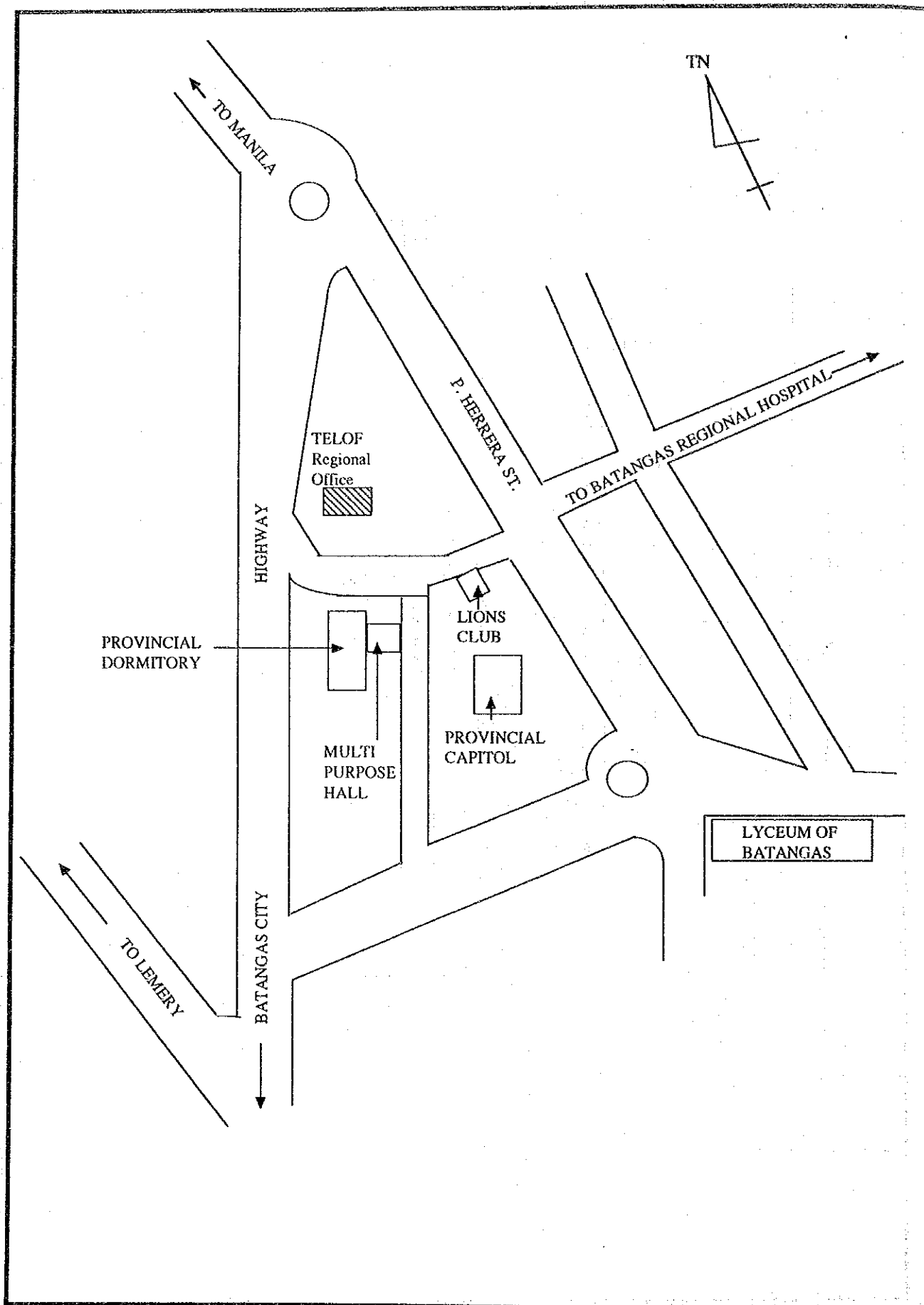
Guide Map (Cabanatuan-1/3,Region III)



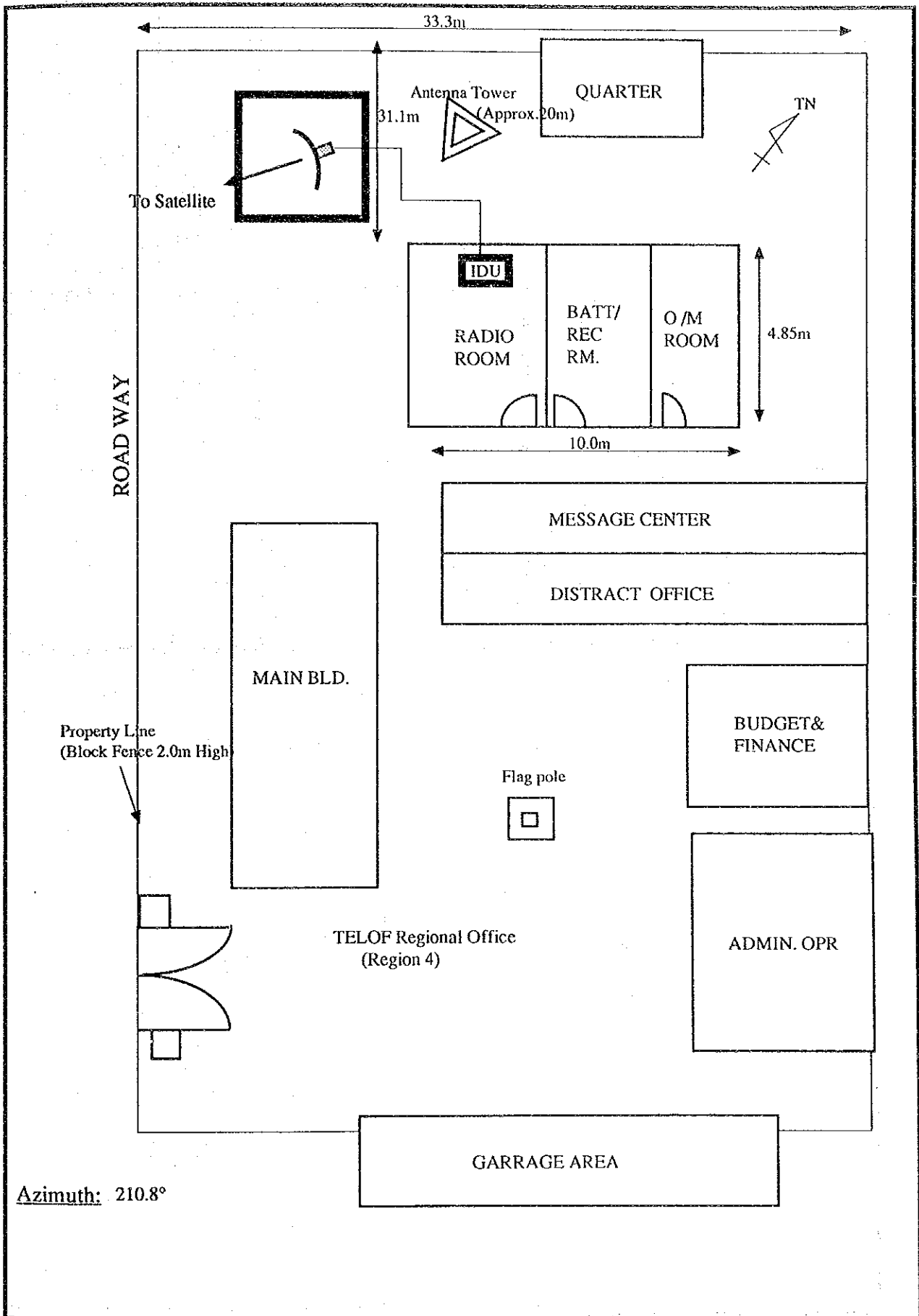
Floor Layout (Cabanatuan-3/3, Region III)



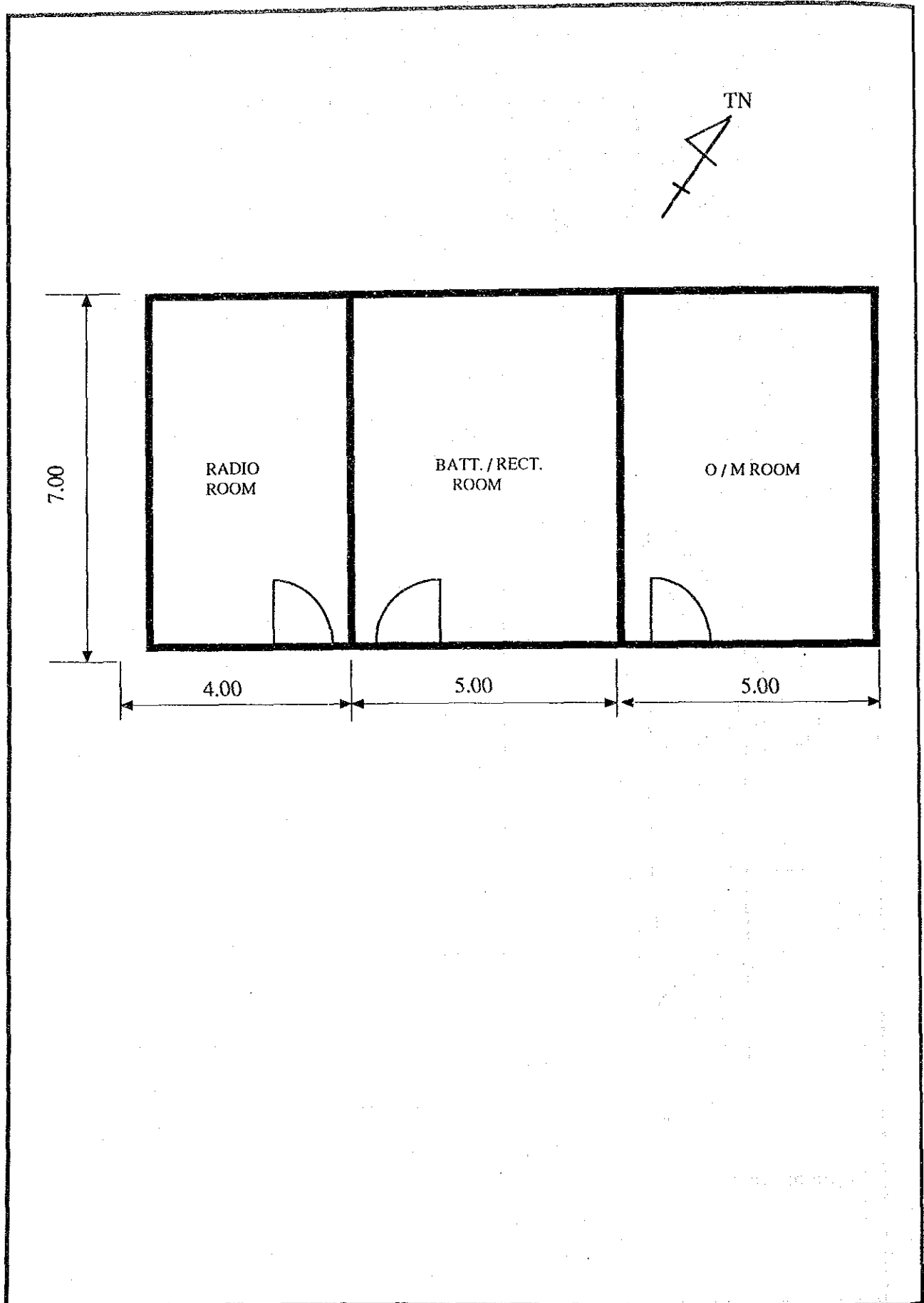
Guide Map (Batangas-1/3, Region IV)



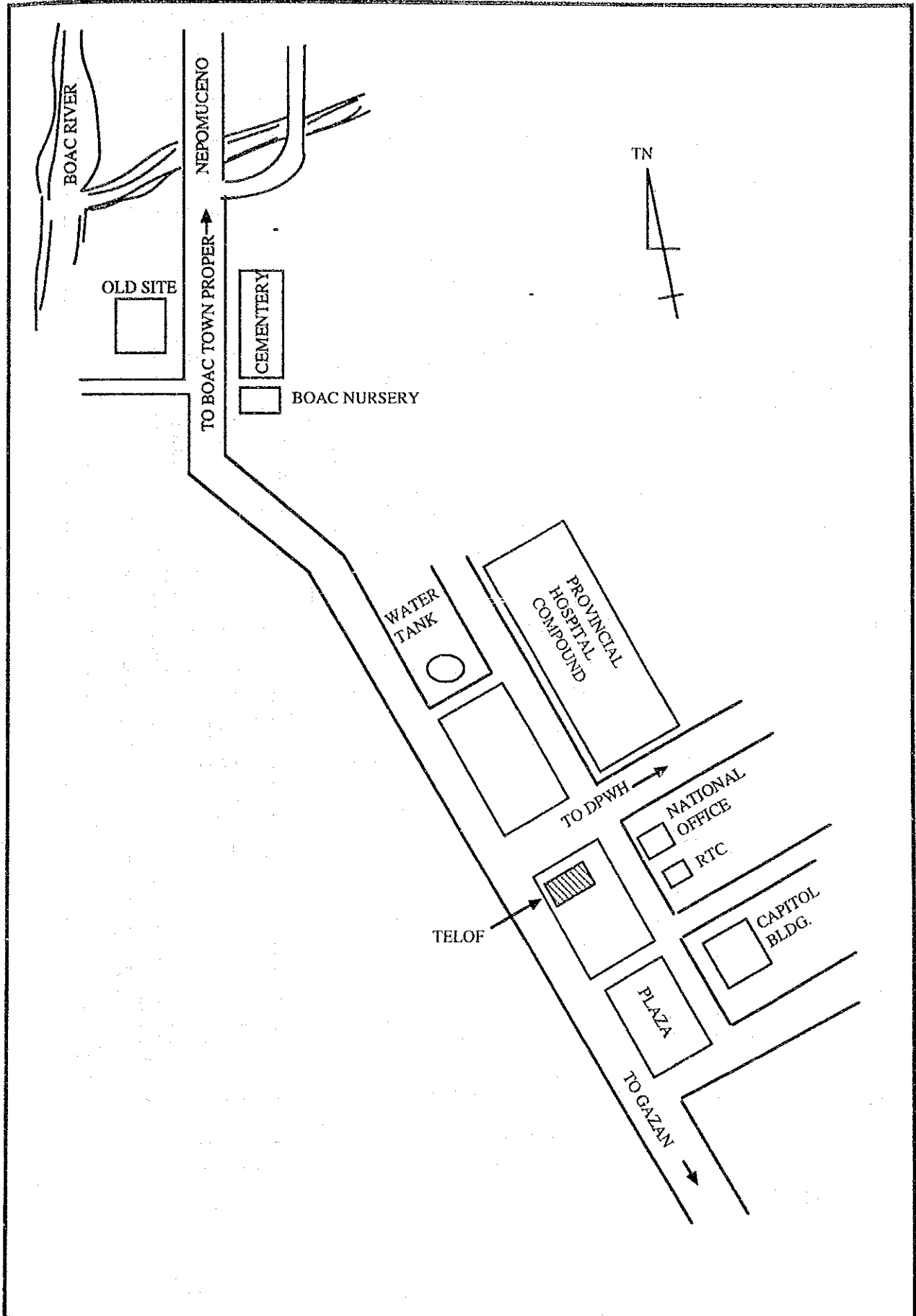
Site Layout (Batangas-2/3, Region IV)



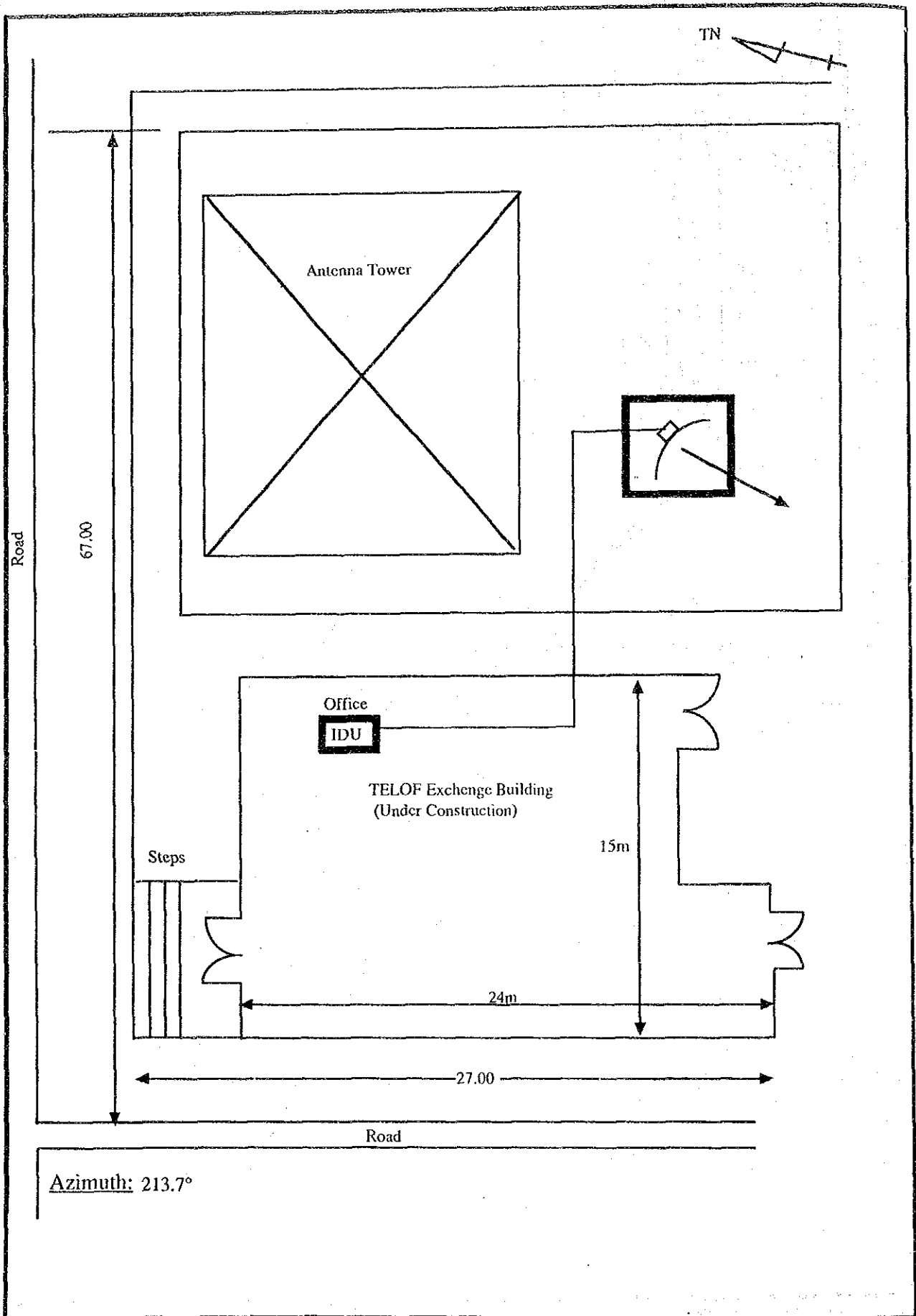
Floor Plan (Batangas-3/3, Region IV)



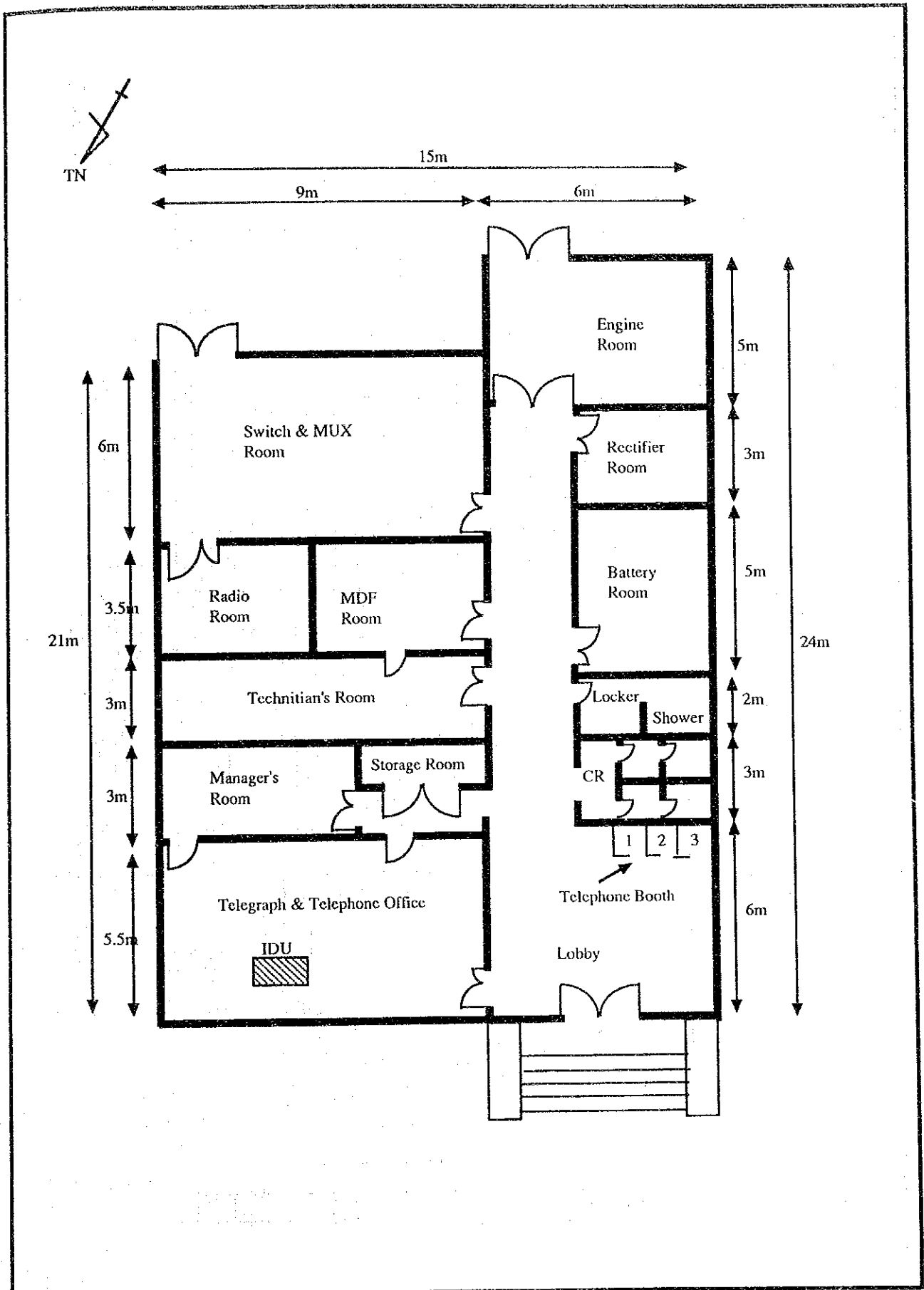
Guide Map (Boac-1/3, Region IV)



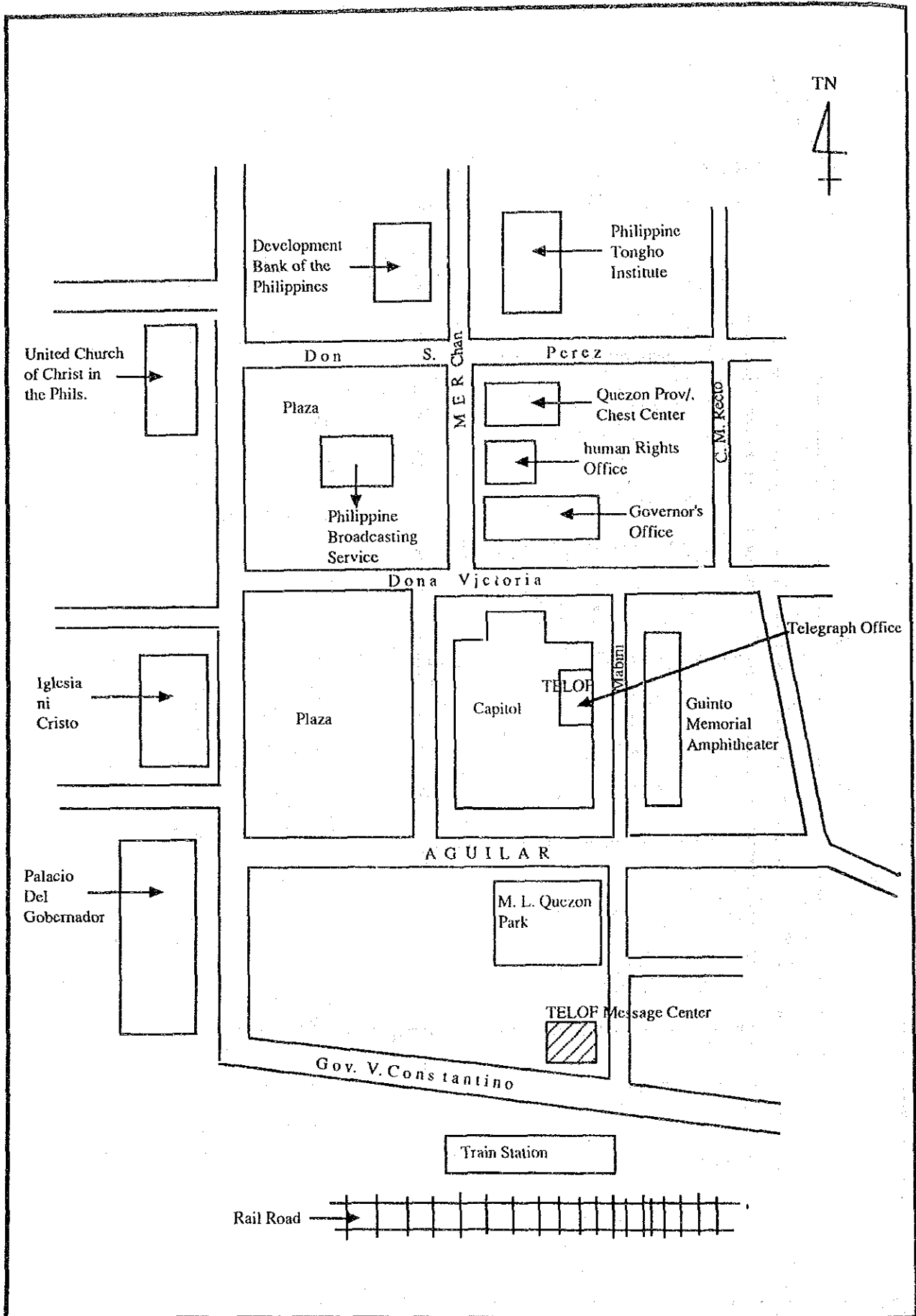
Site Layout (Boac-2/3, Region IV)



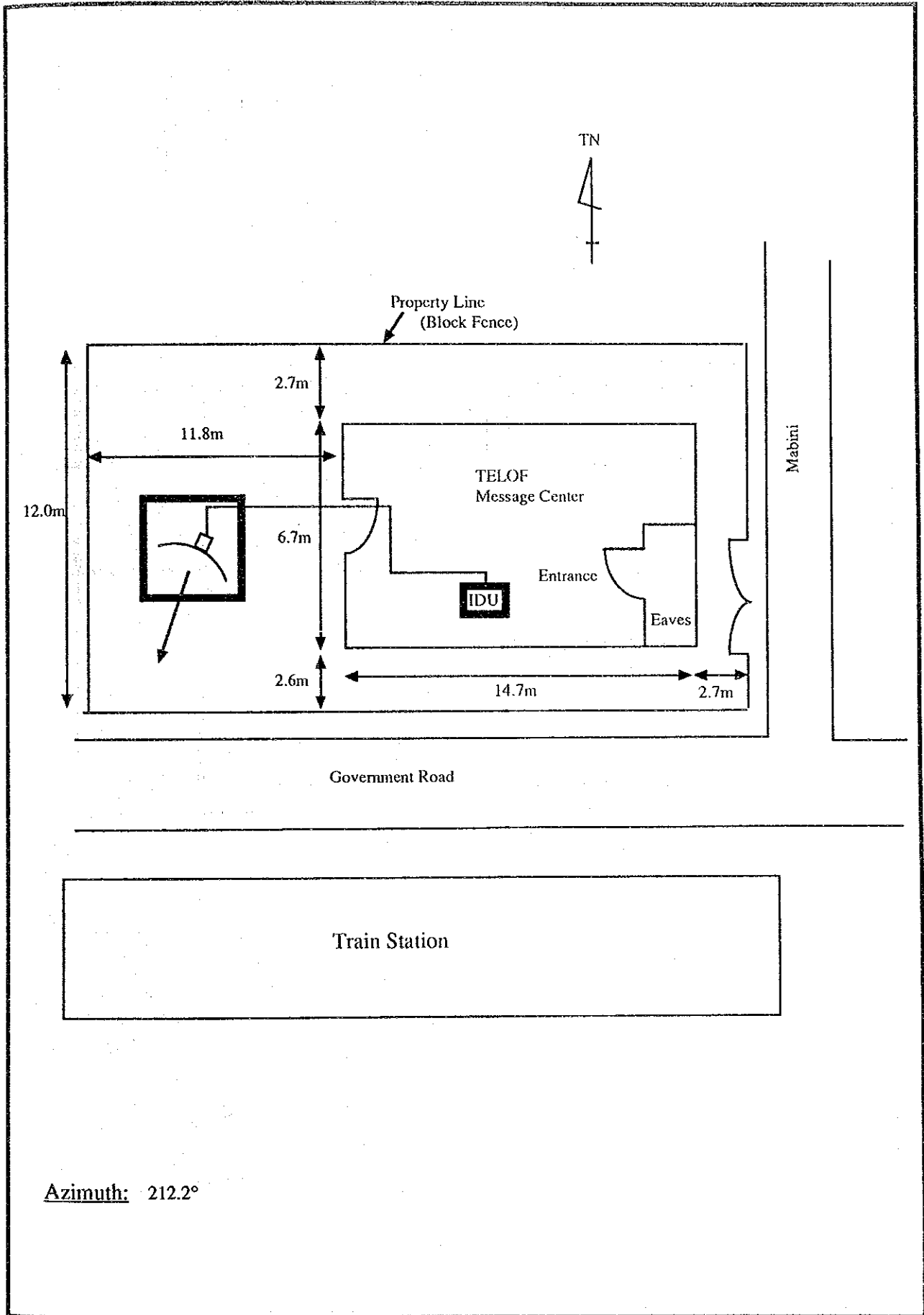
Floor Layout (Boac-3/3, Region IV)



Guide Map (Lucena-1/3, Region IV)

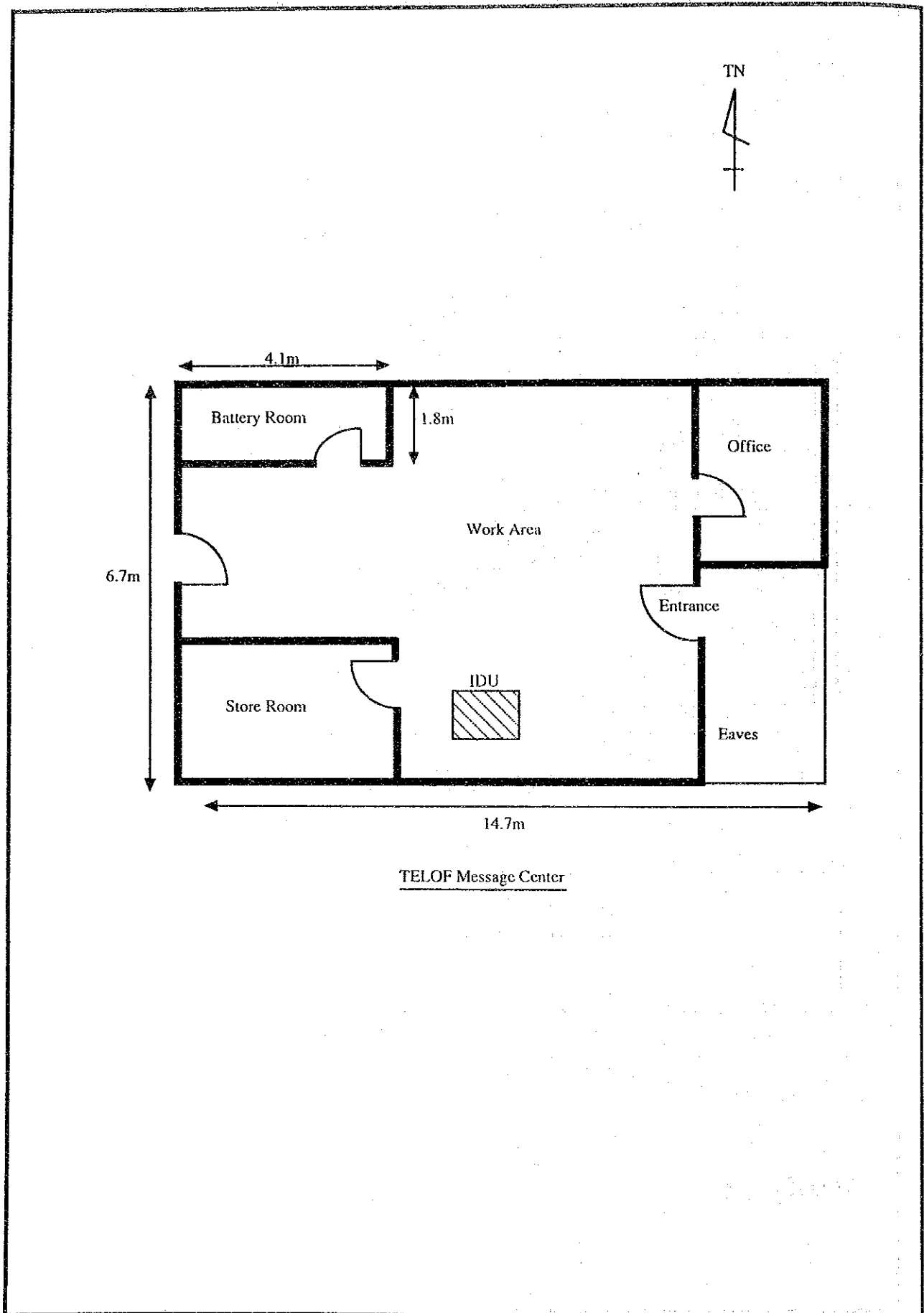


Site Layout (Lucena-2/3, Region IV)



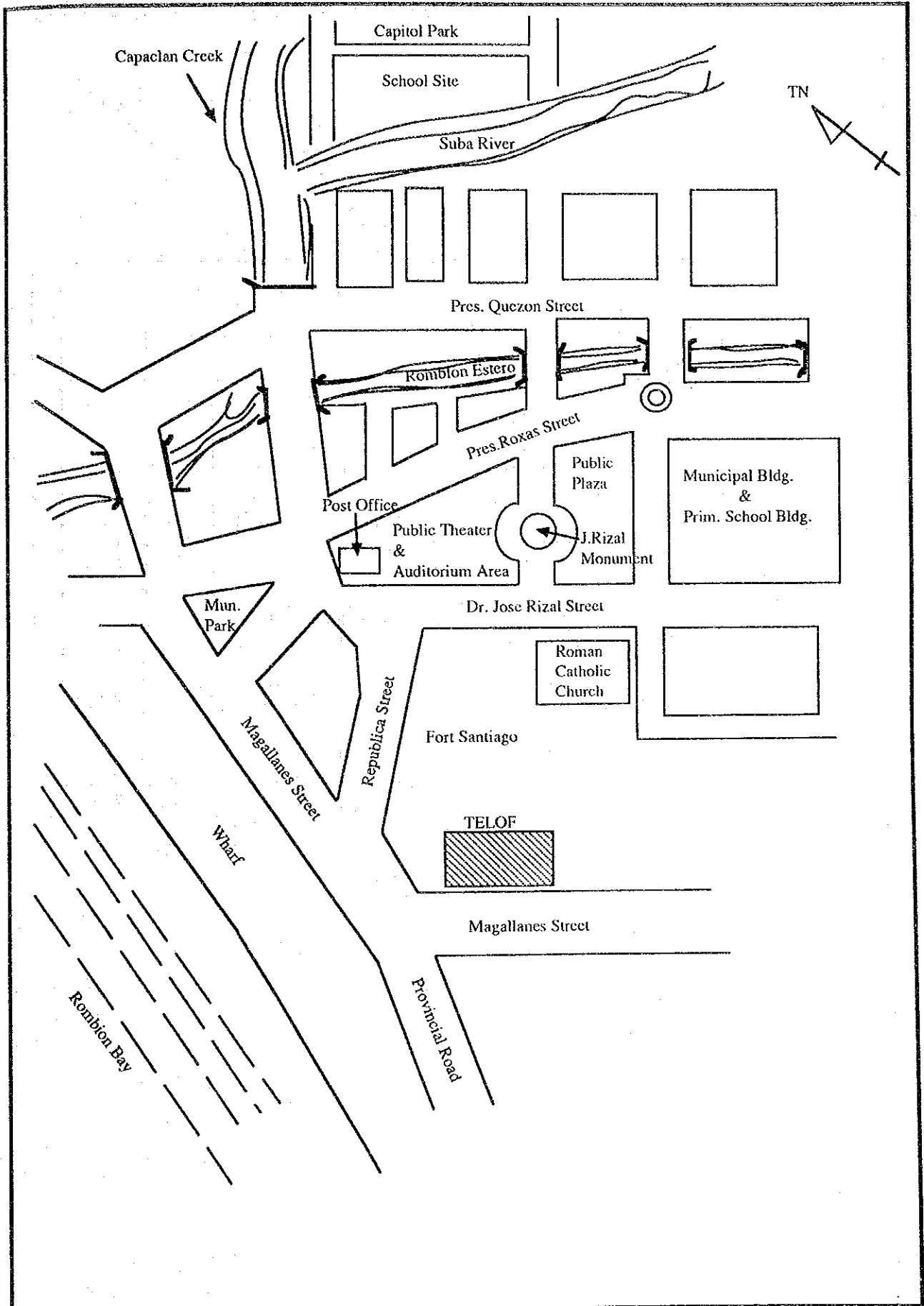
Azimuth: 212.2°

Floor Layout (Lucena-3/3, Region IV)

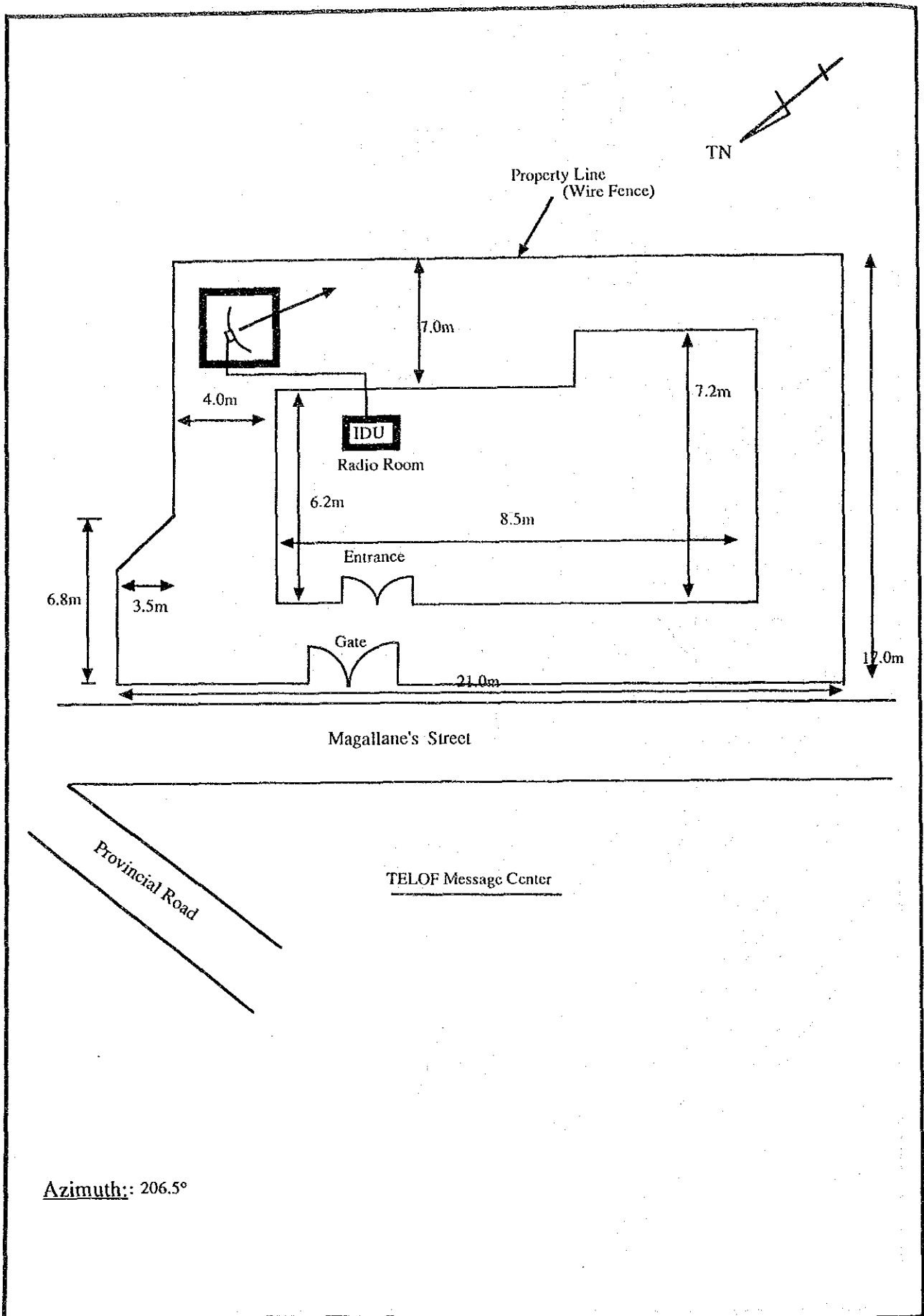


TELOF Message Center

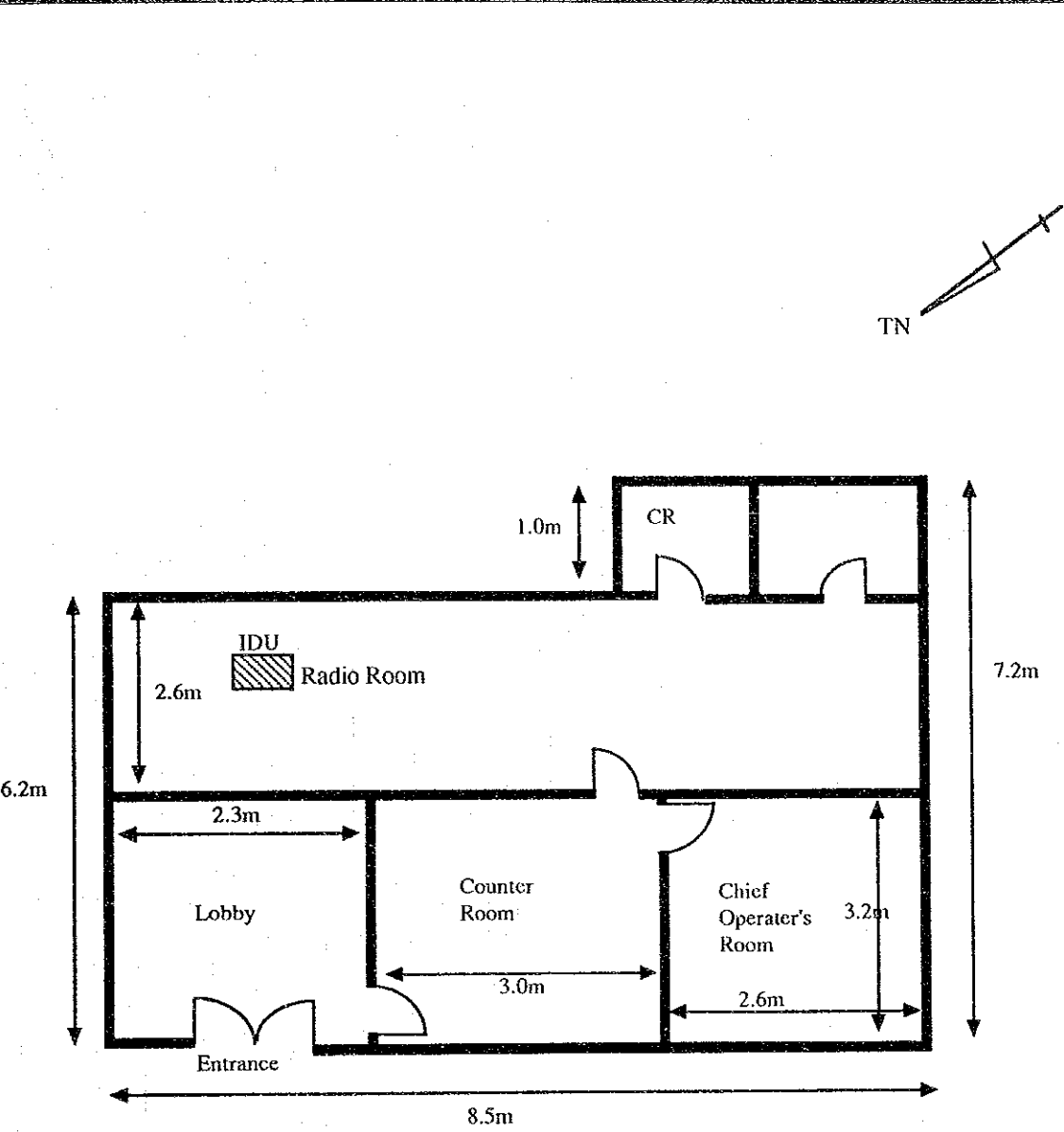
Guide Map (Romblon-1/3, Region IV)



Site Layout (Romblon-2/3, Region IV)

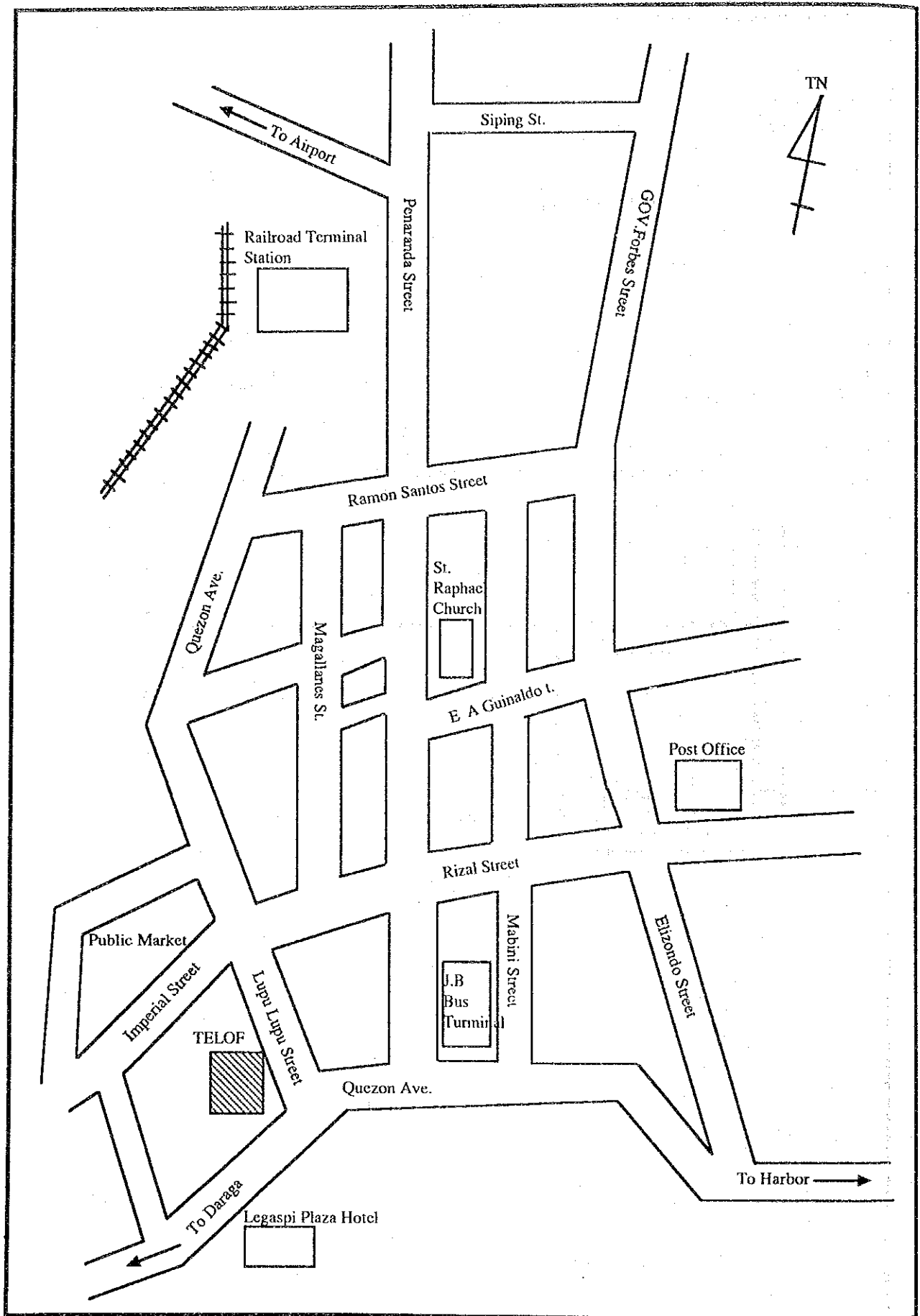


Floor Layout (Romblon-3/3, Region IV)

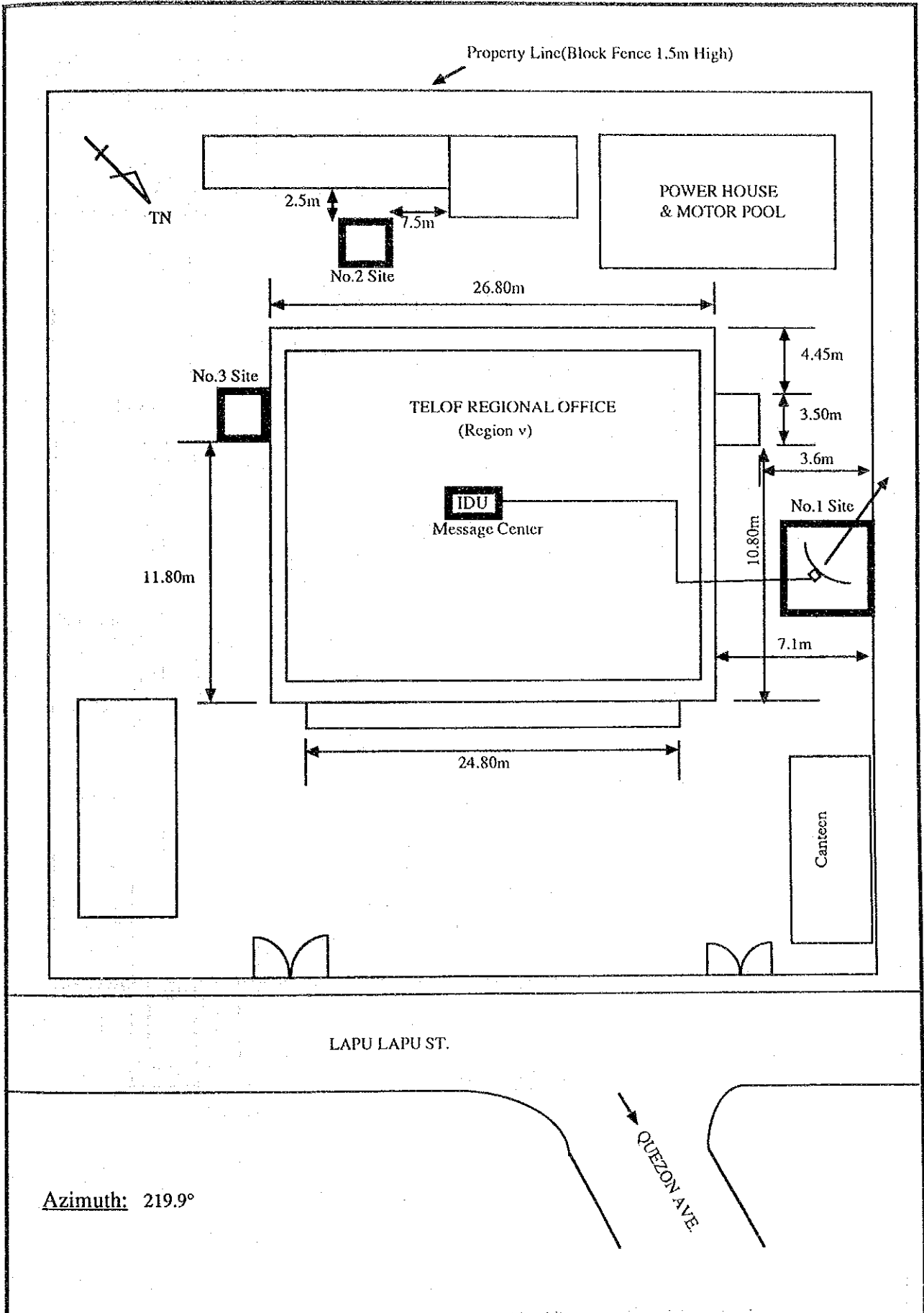


TELOF Message Center

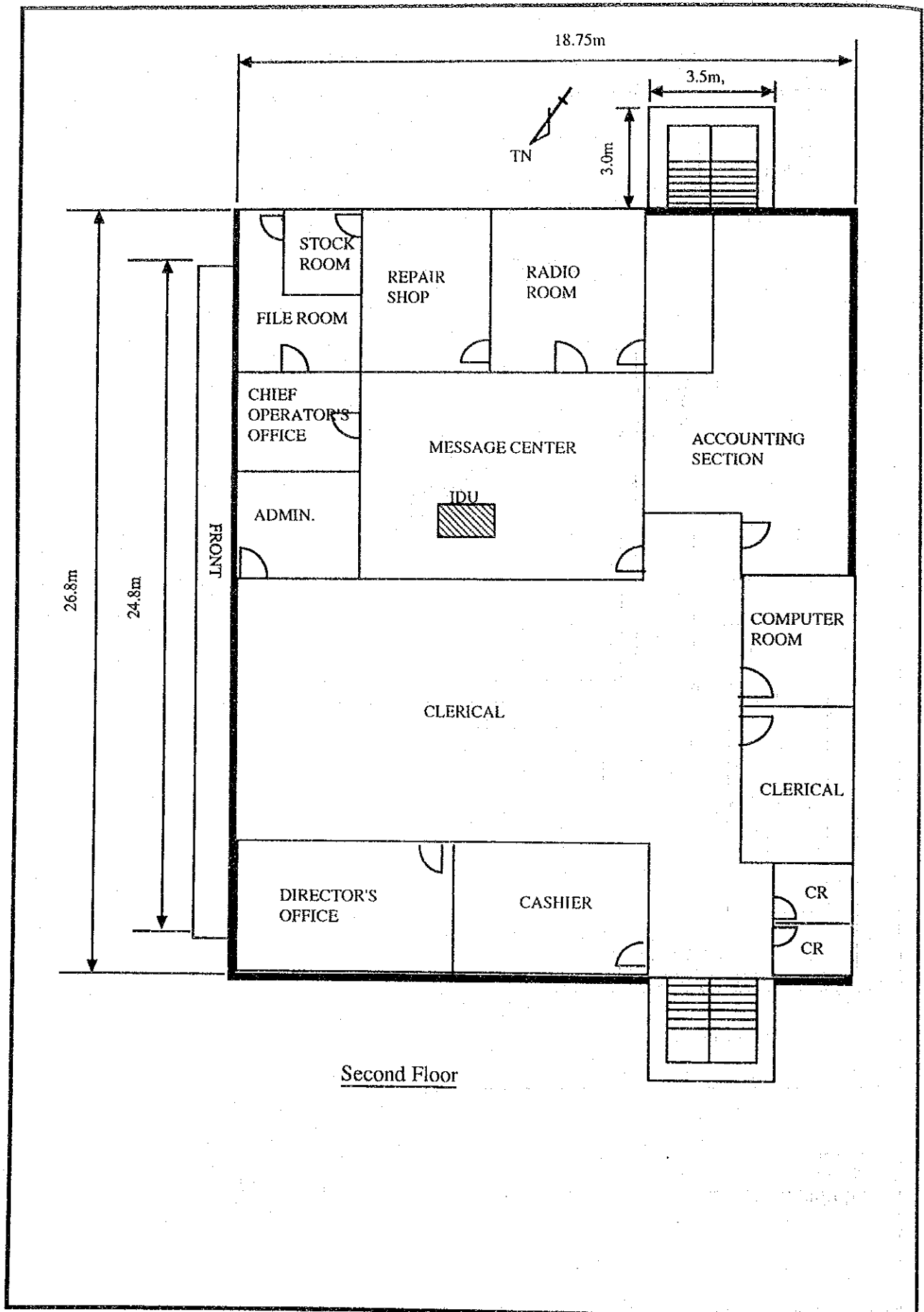
Guide Map(Legaspi-1/3,Region V)



Site Layout (Legaspi-2/3, Region V)

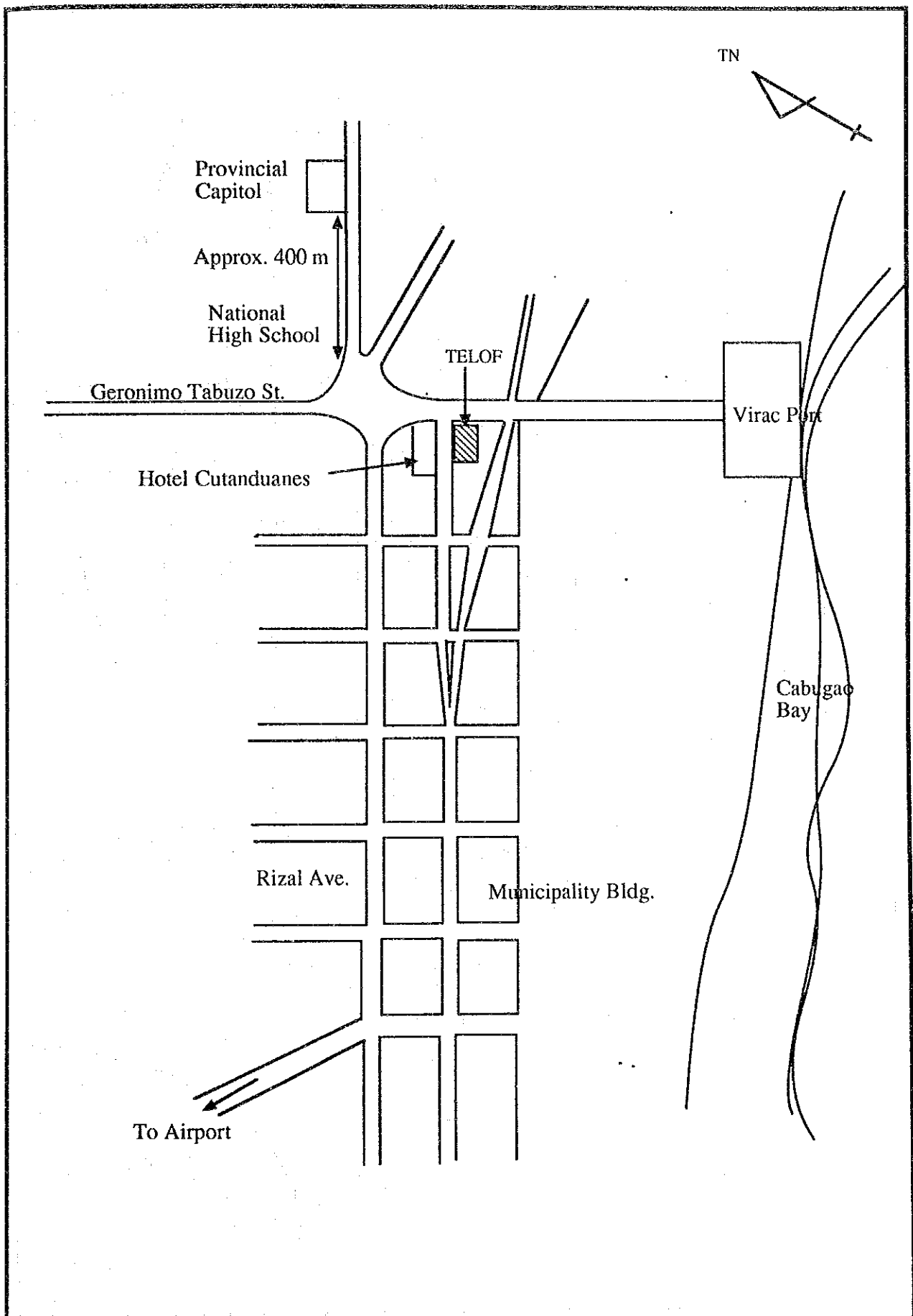


Floor Layout (Legaspi-3/3, Region V)

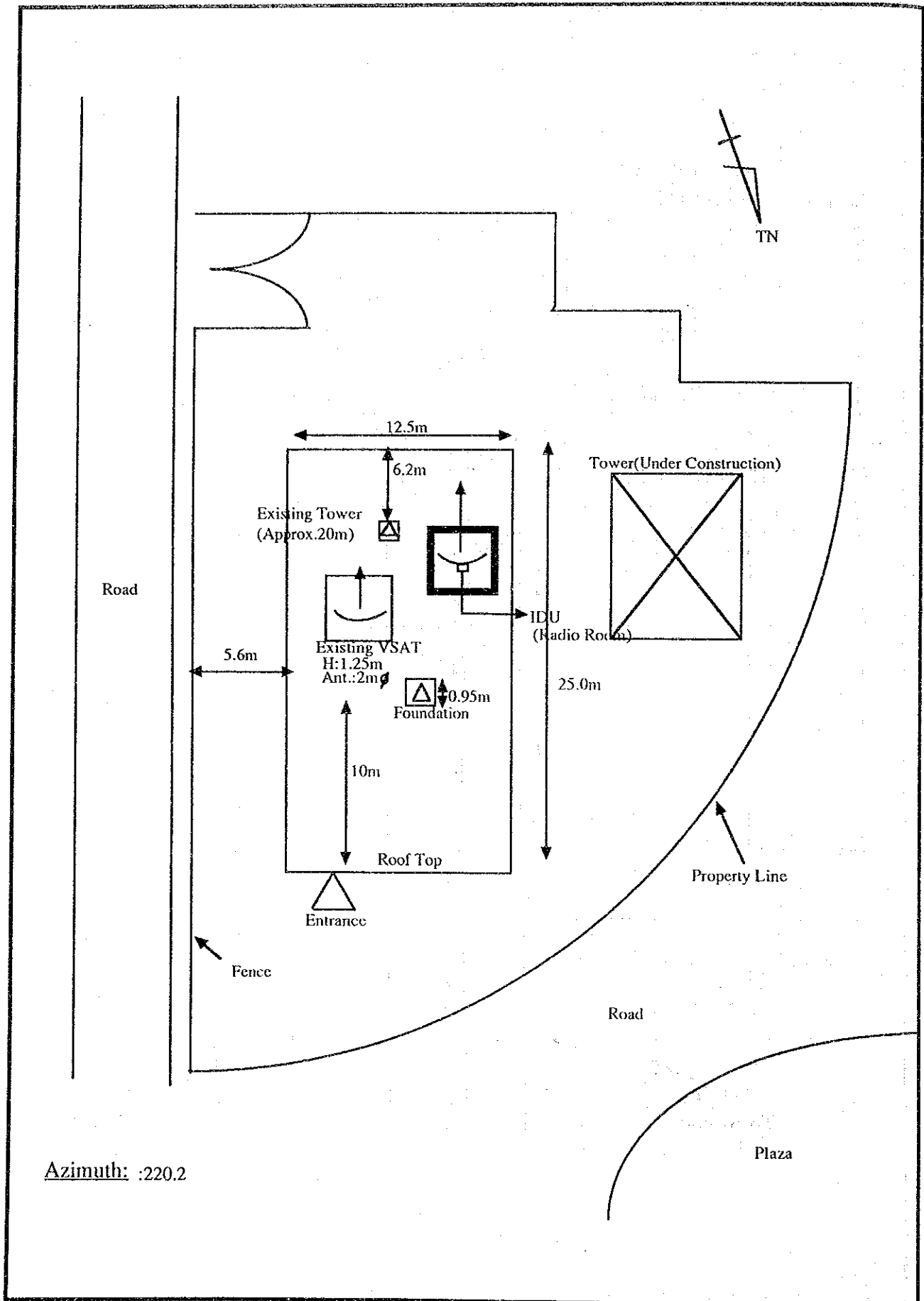


Second Floor

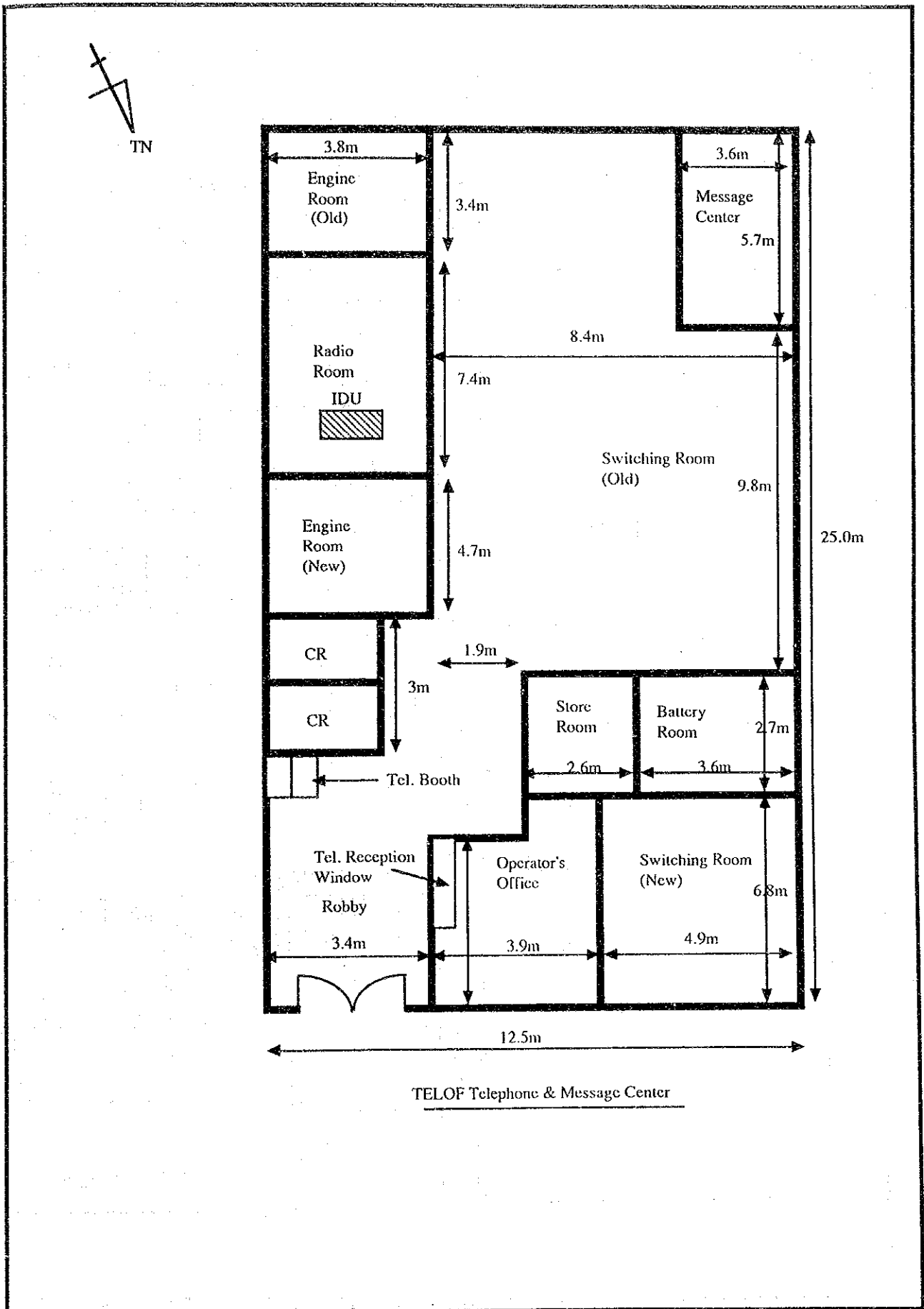
Guide Map (Virac-1/3, Region V)



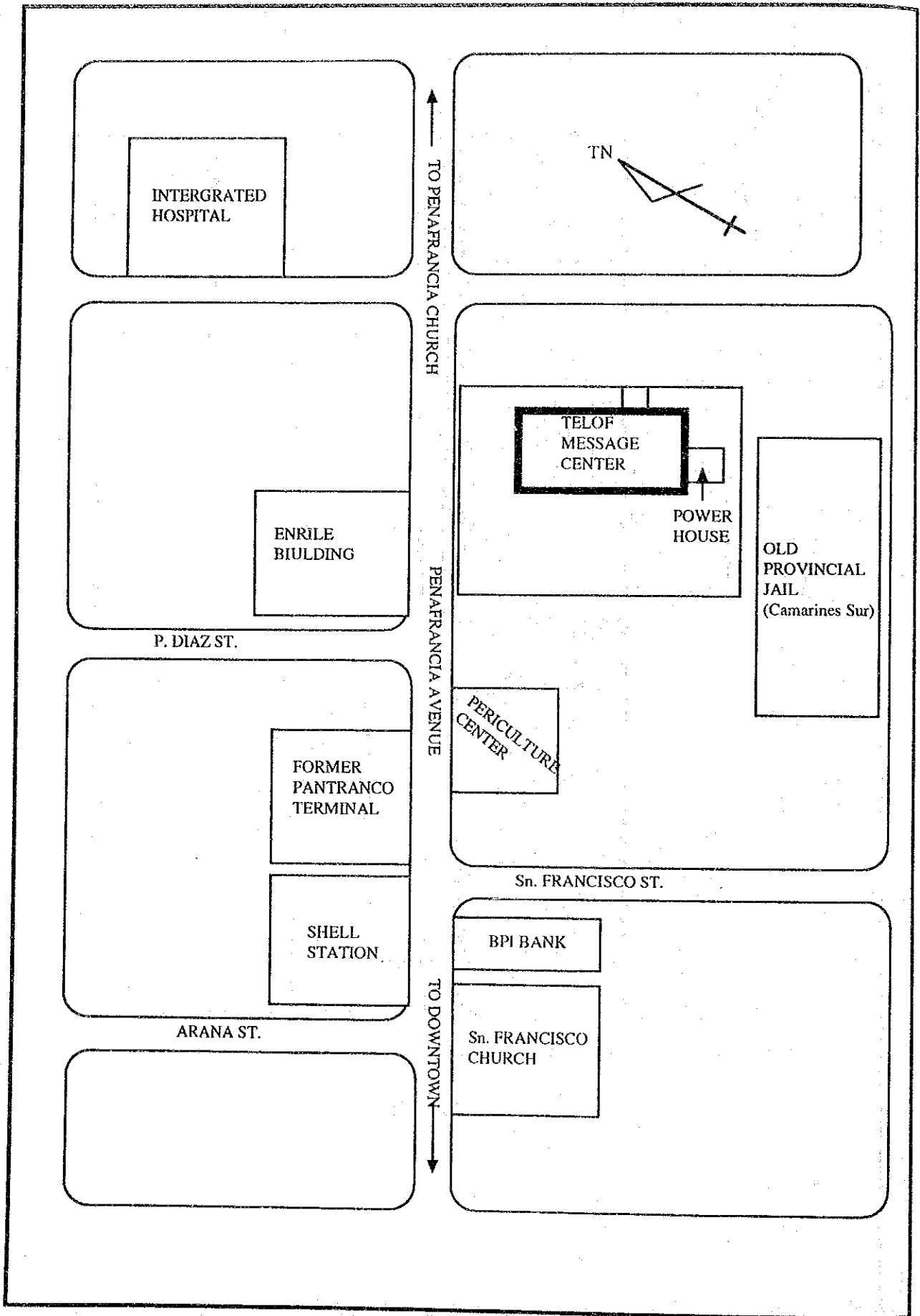
Site Layout (Virac-2/3, Region V)



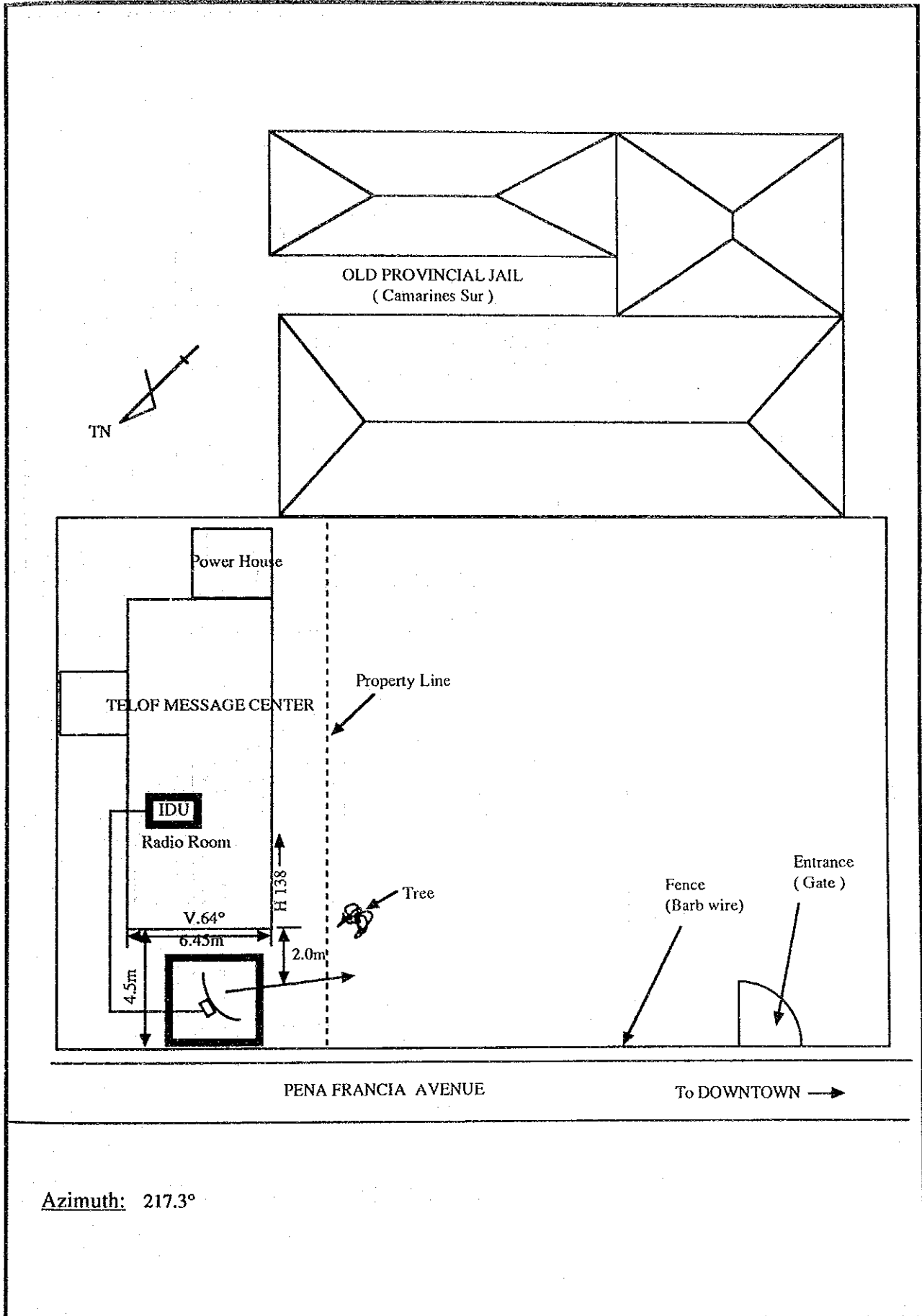
Floor Layout (Virac-3/3, Region V)



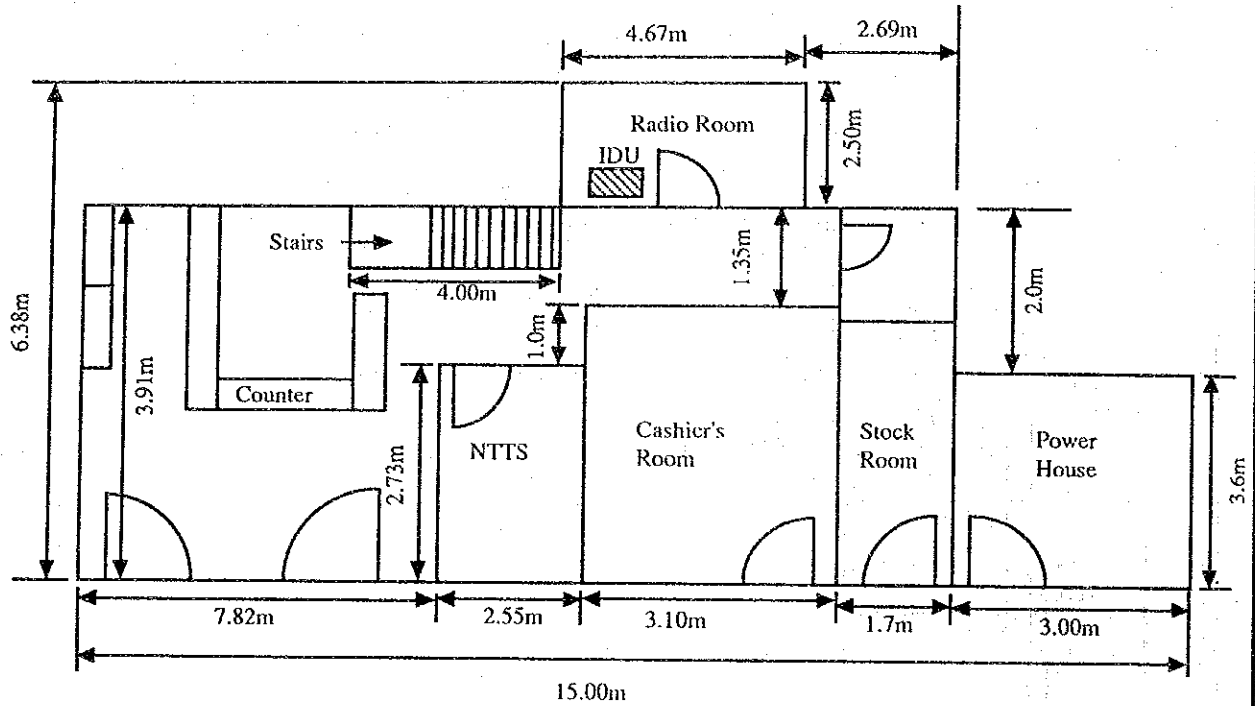
Guide Map (Naga-1/3, Region V)



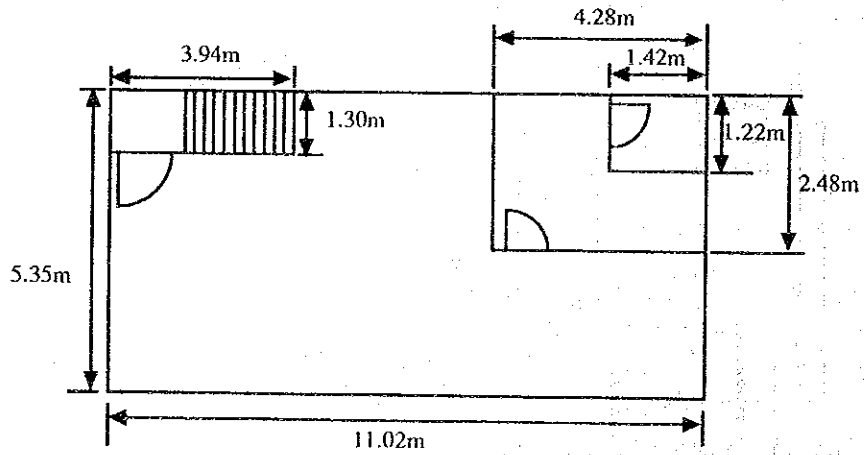
Site Layout (Naga-2/3, Region V)



Floor Layout (Naga-3/3, Region V)



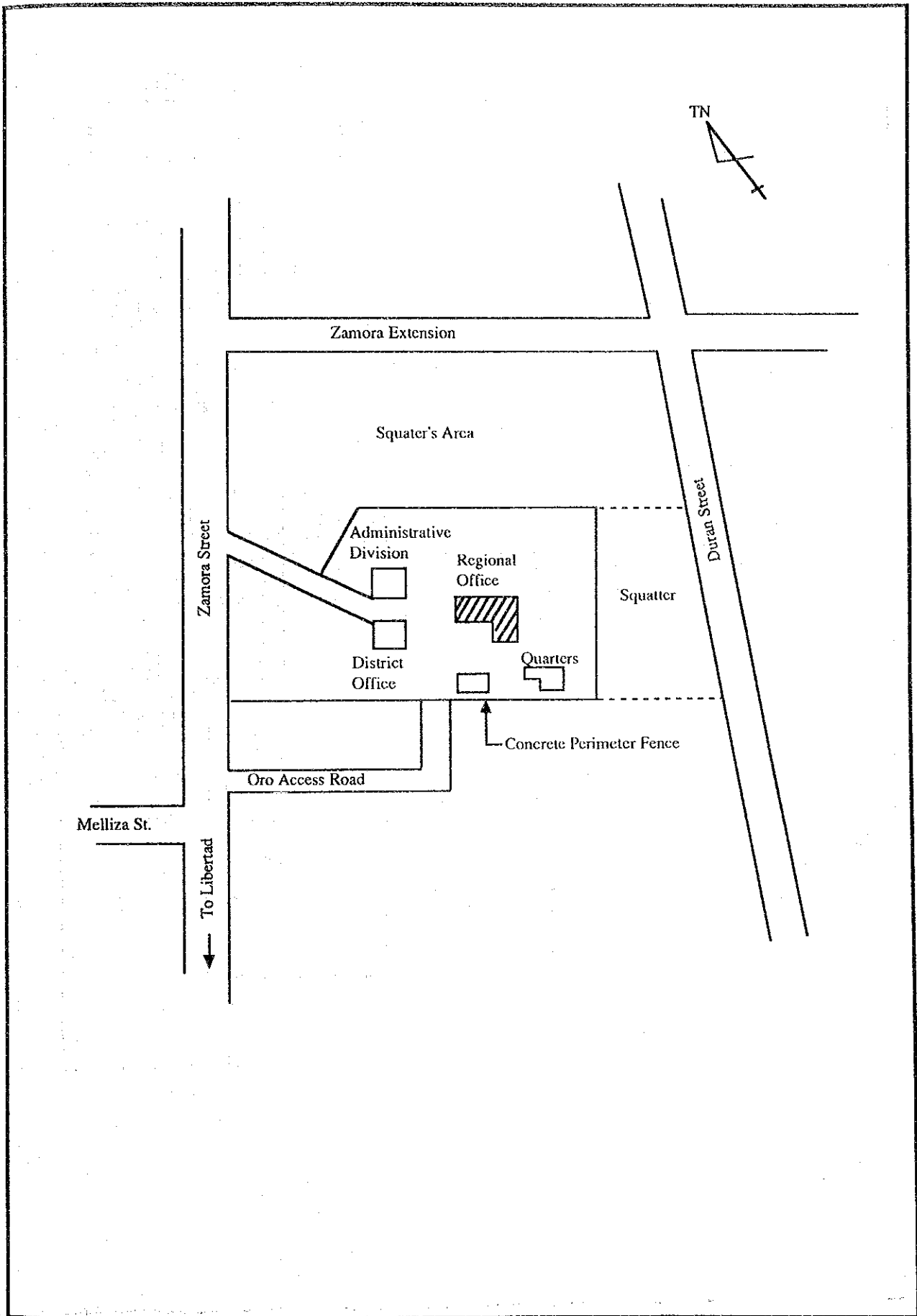
GROUND FLOOR PLAN



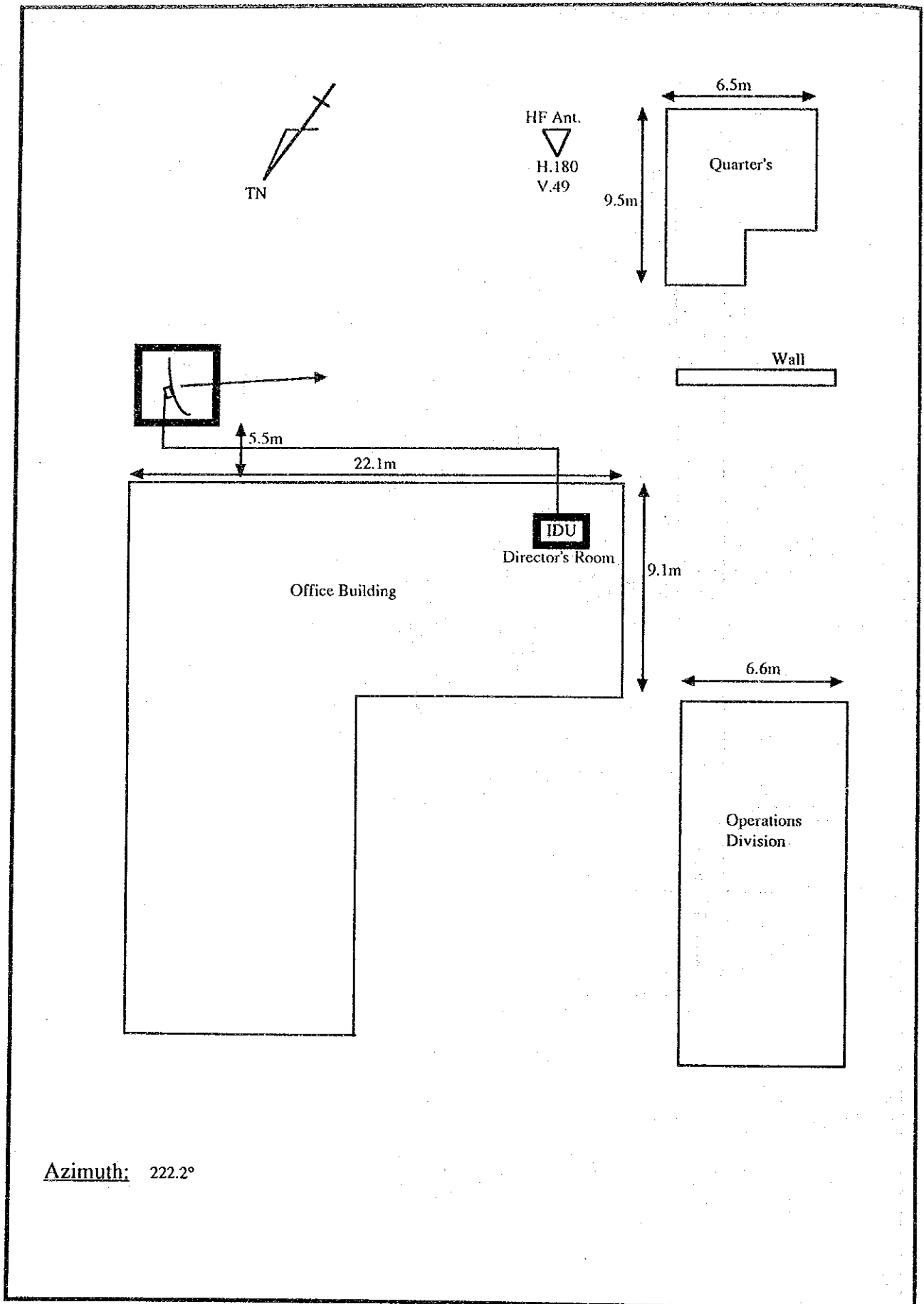
2nd FLOOR PLAN

TELOF Message Center

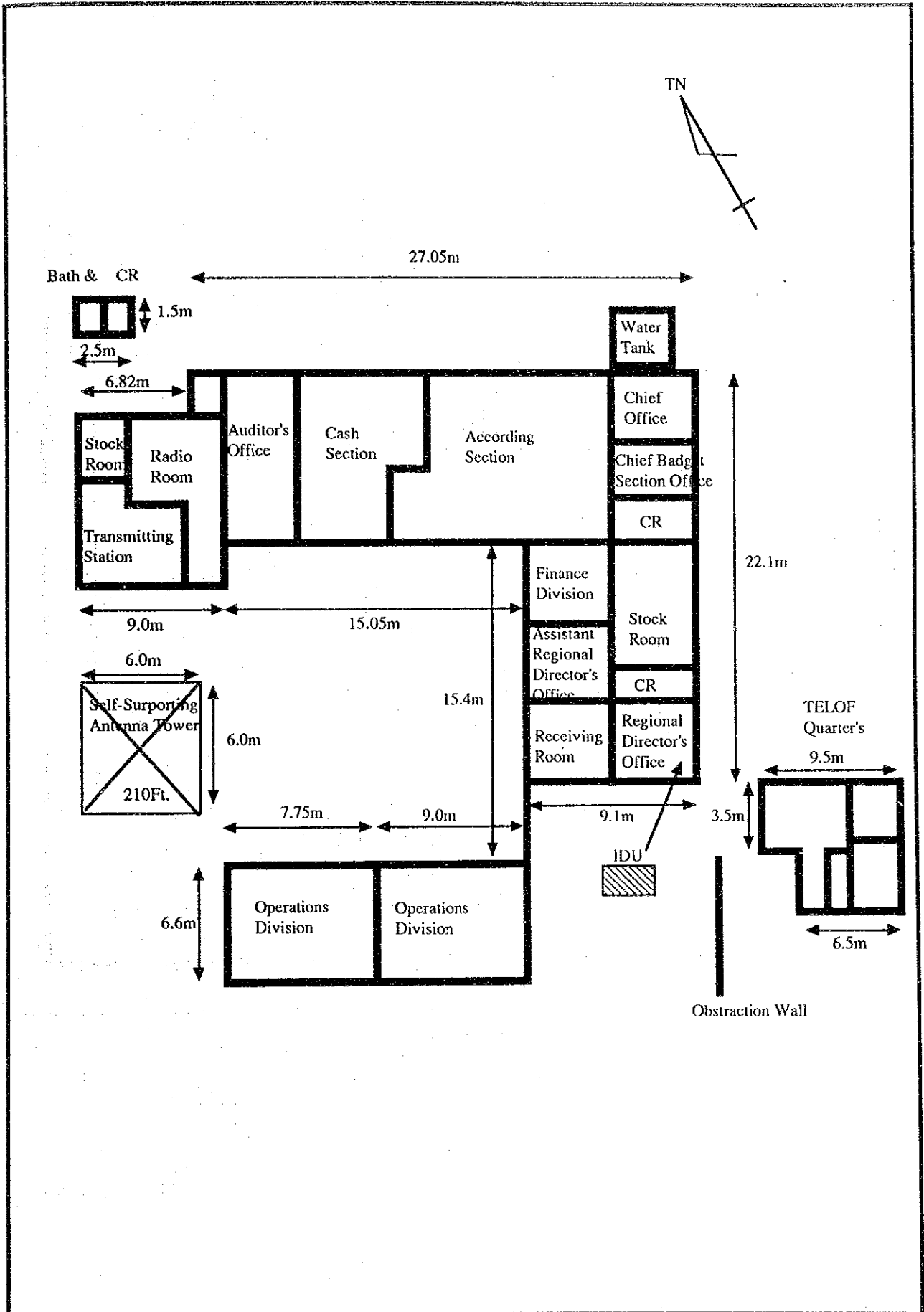
Guide Map (Iloilo-1/3, Region VI)



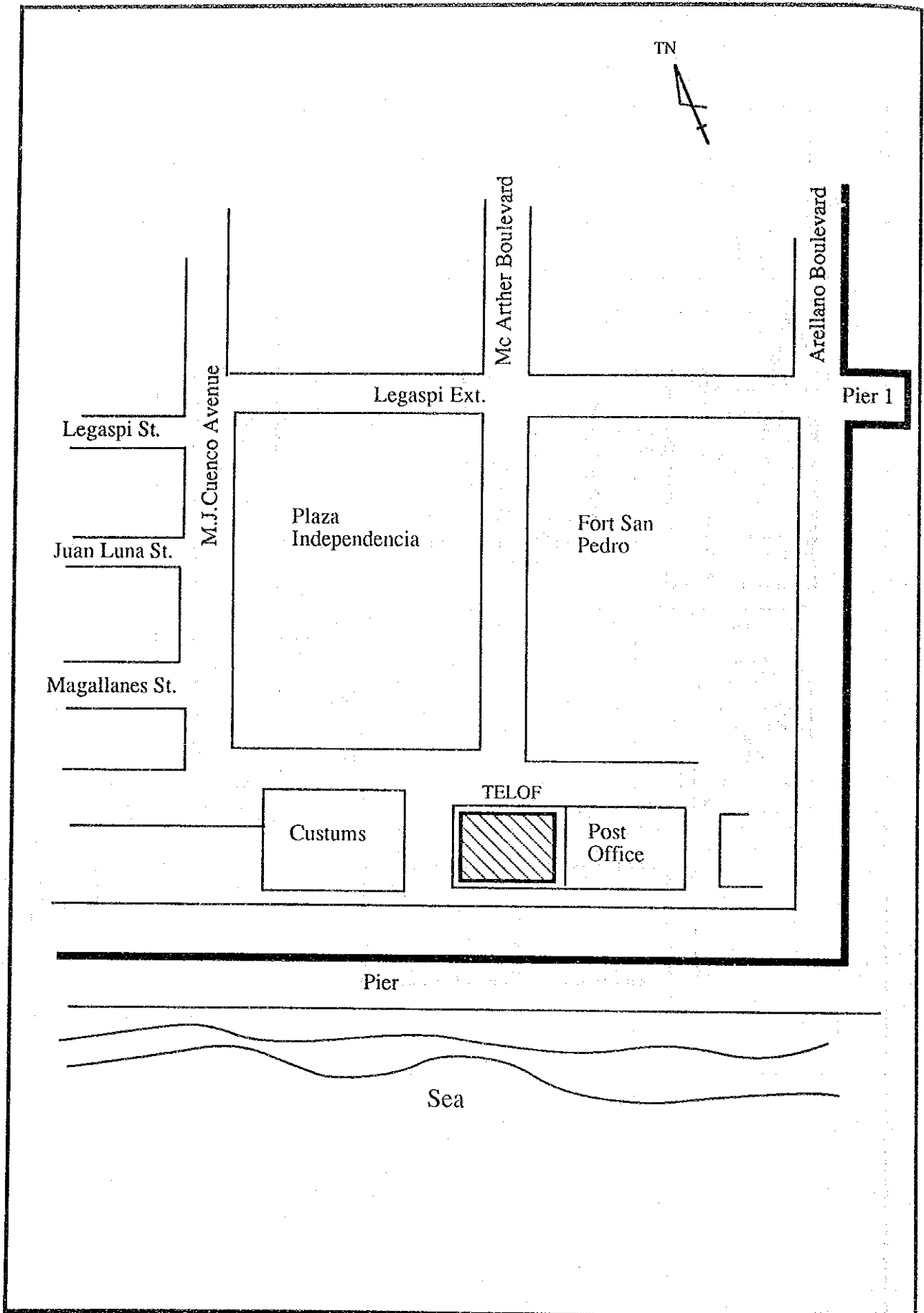
Site Layout (Iloilo-2/3, Region VI)



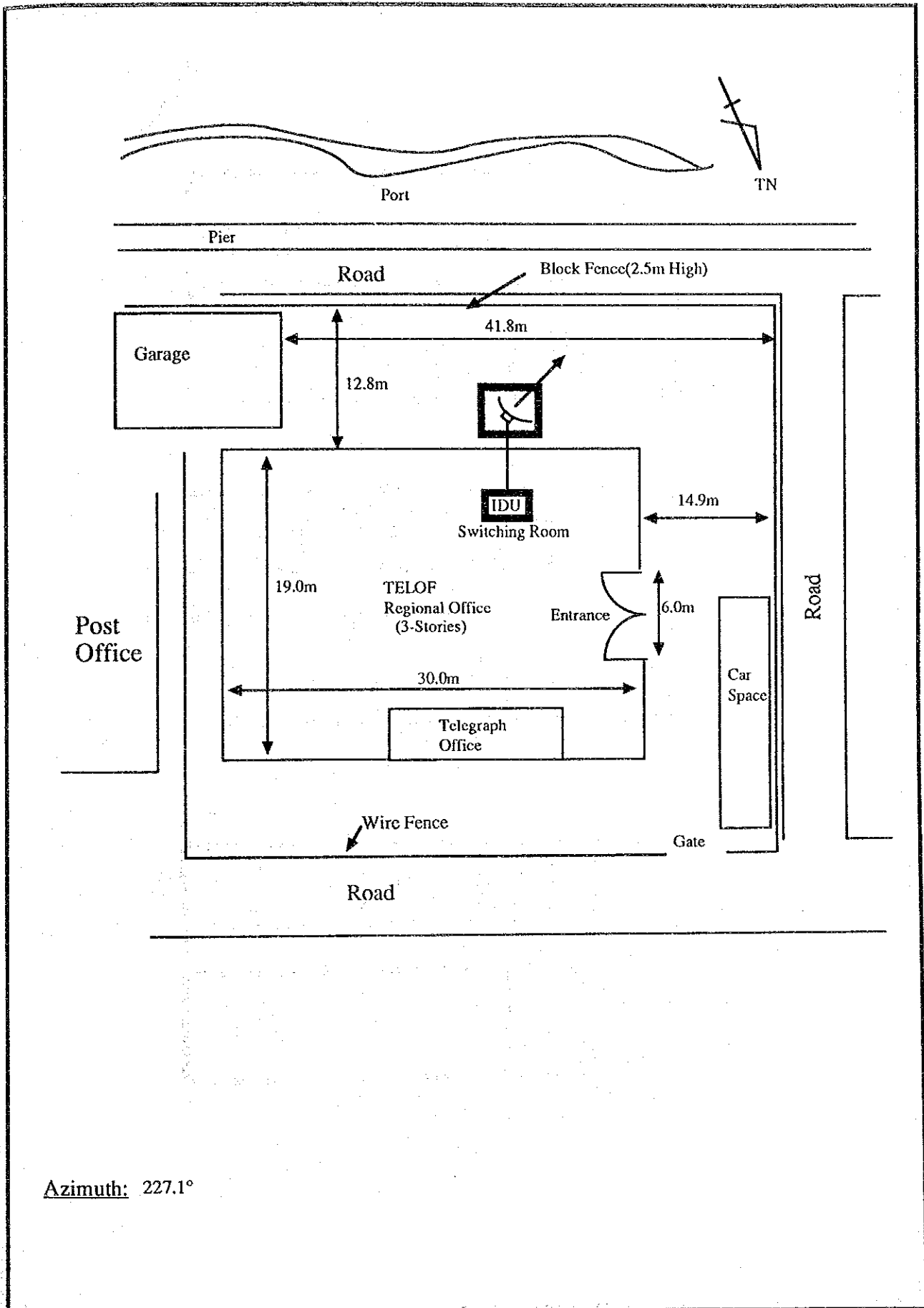
Floor Layout (Iloilo-3/3, Region VI)



Guide Map (Cebu-1/3, Region VII)

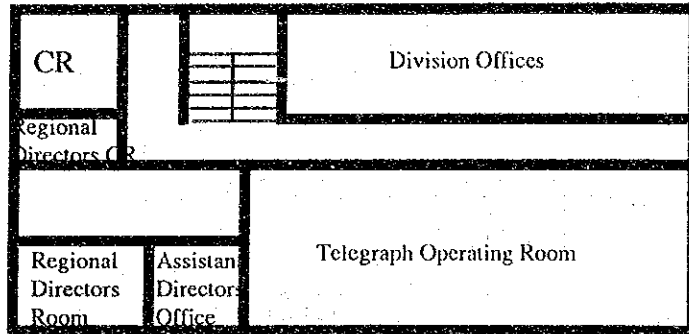
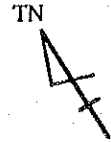


Site Layout (Cebu-2/3, Region VII)

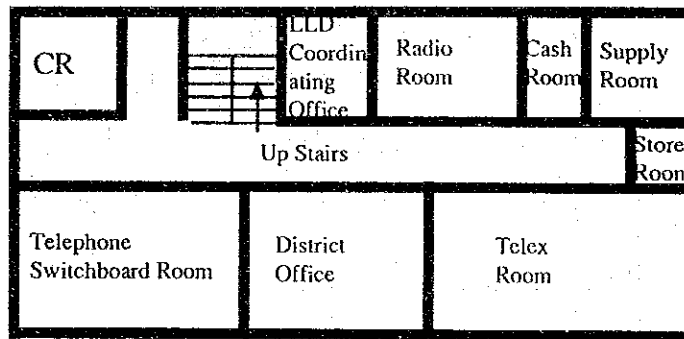


Azimuth: 227.1°

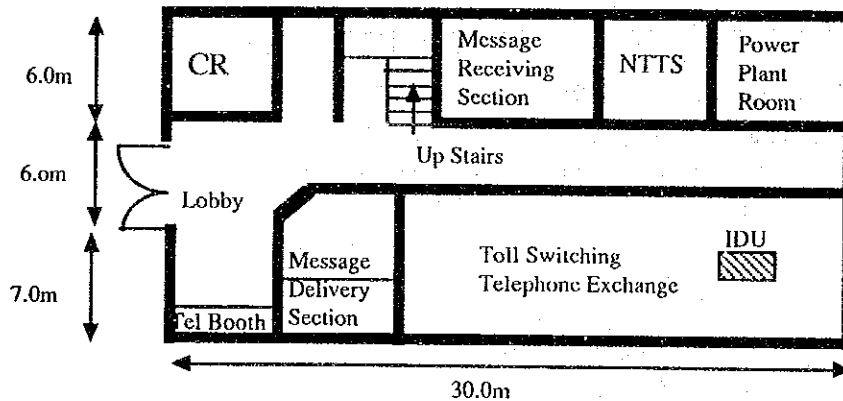
Floor Layout (Cebu-3/3, Region VII)



Third Floor

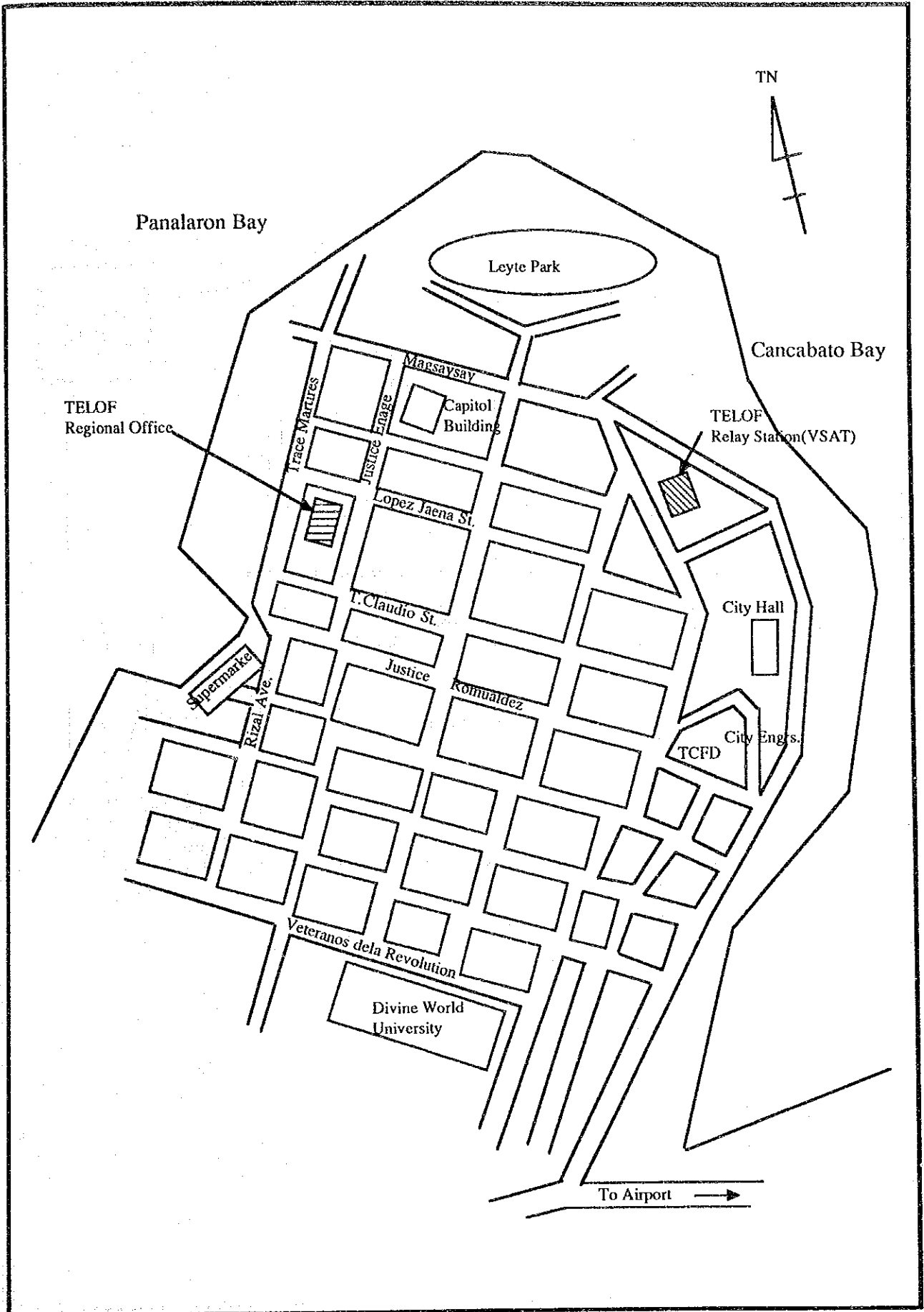


Second Floor

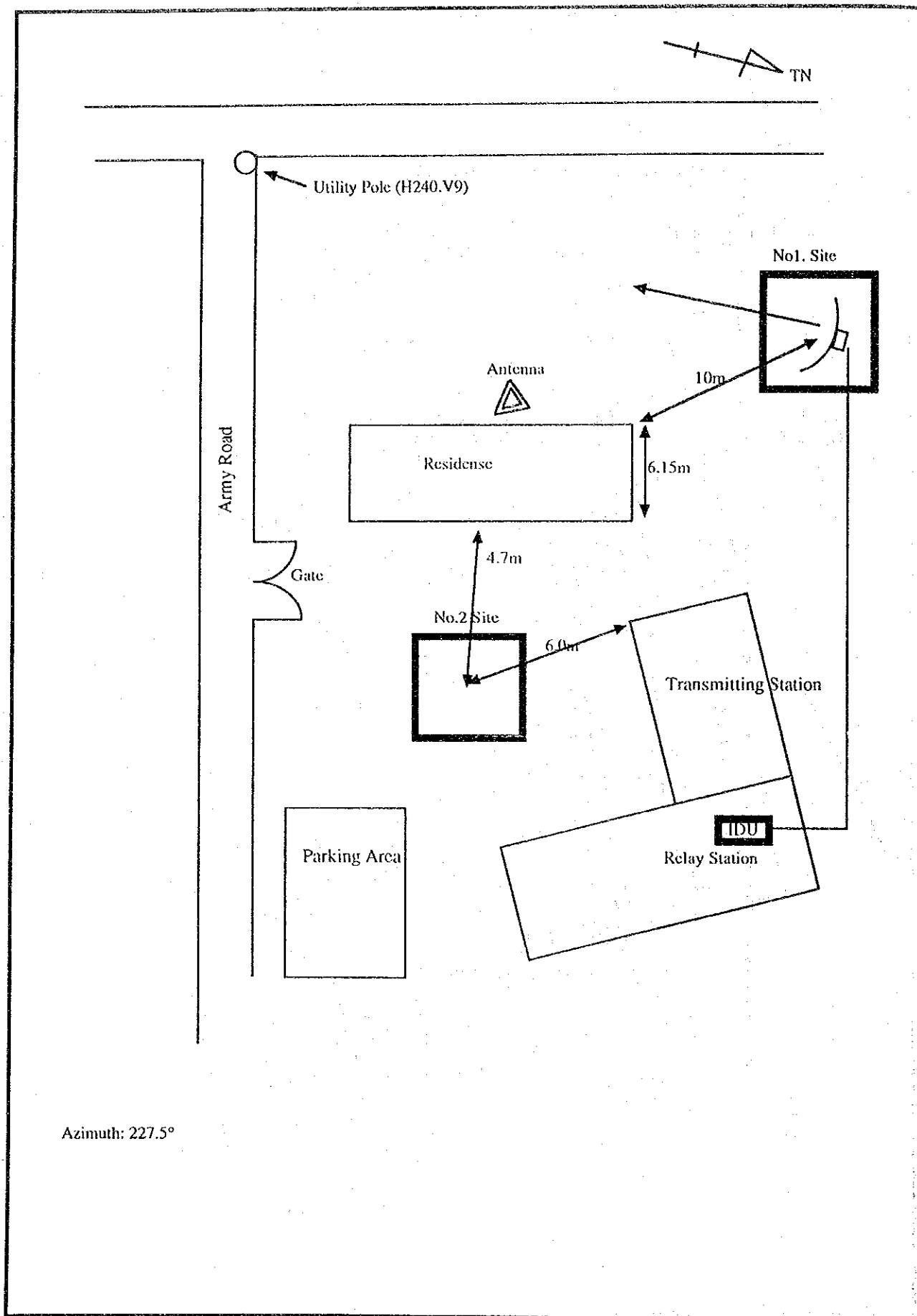


First Floor

Guide Map (Tacloban-1/3, Region VIII)

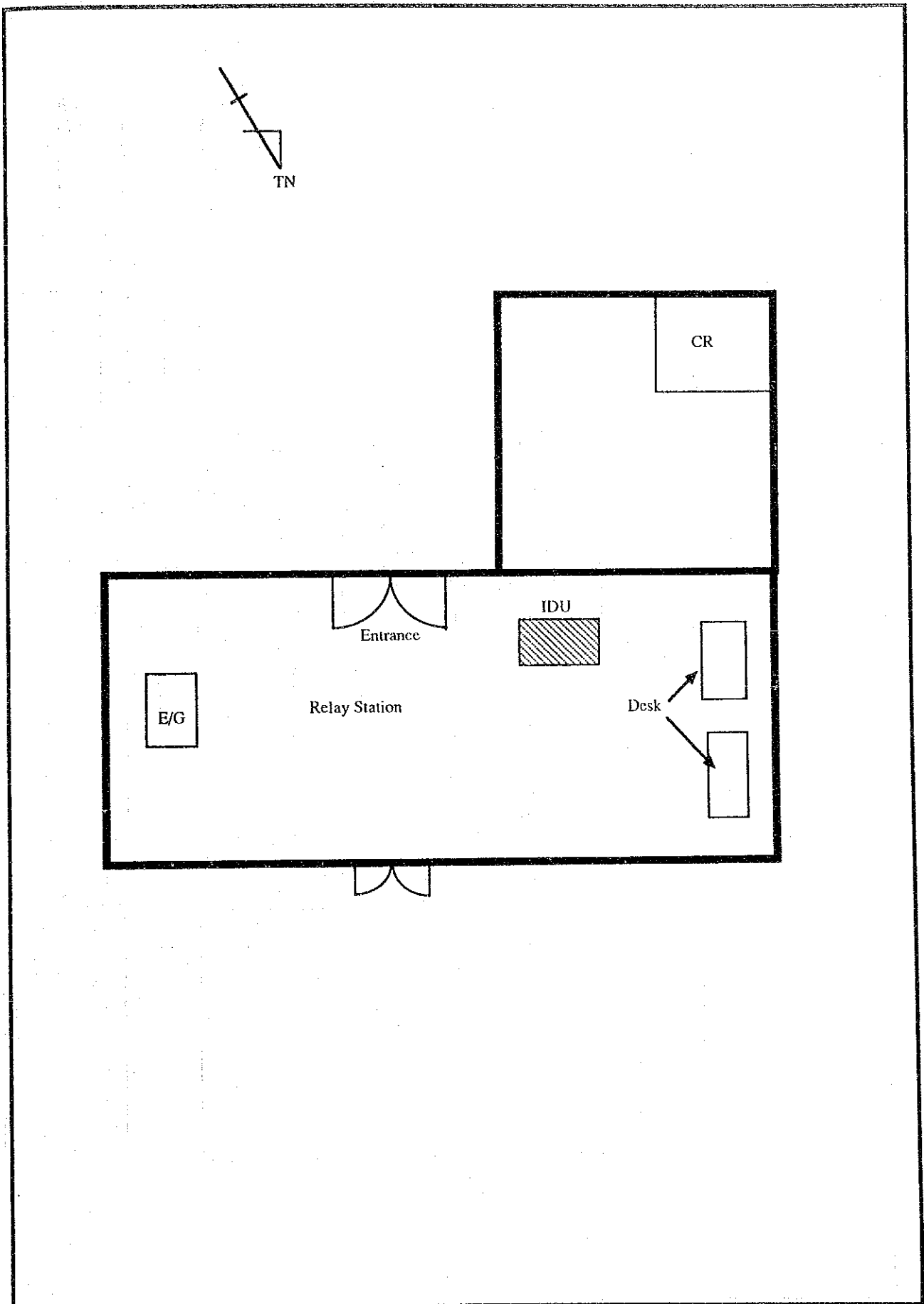


Site Layout (Tacloban-2/3, Region VIII)

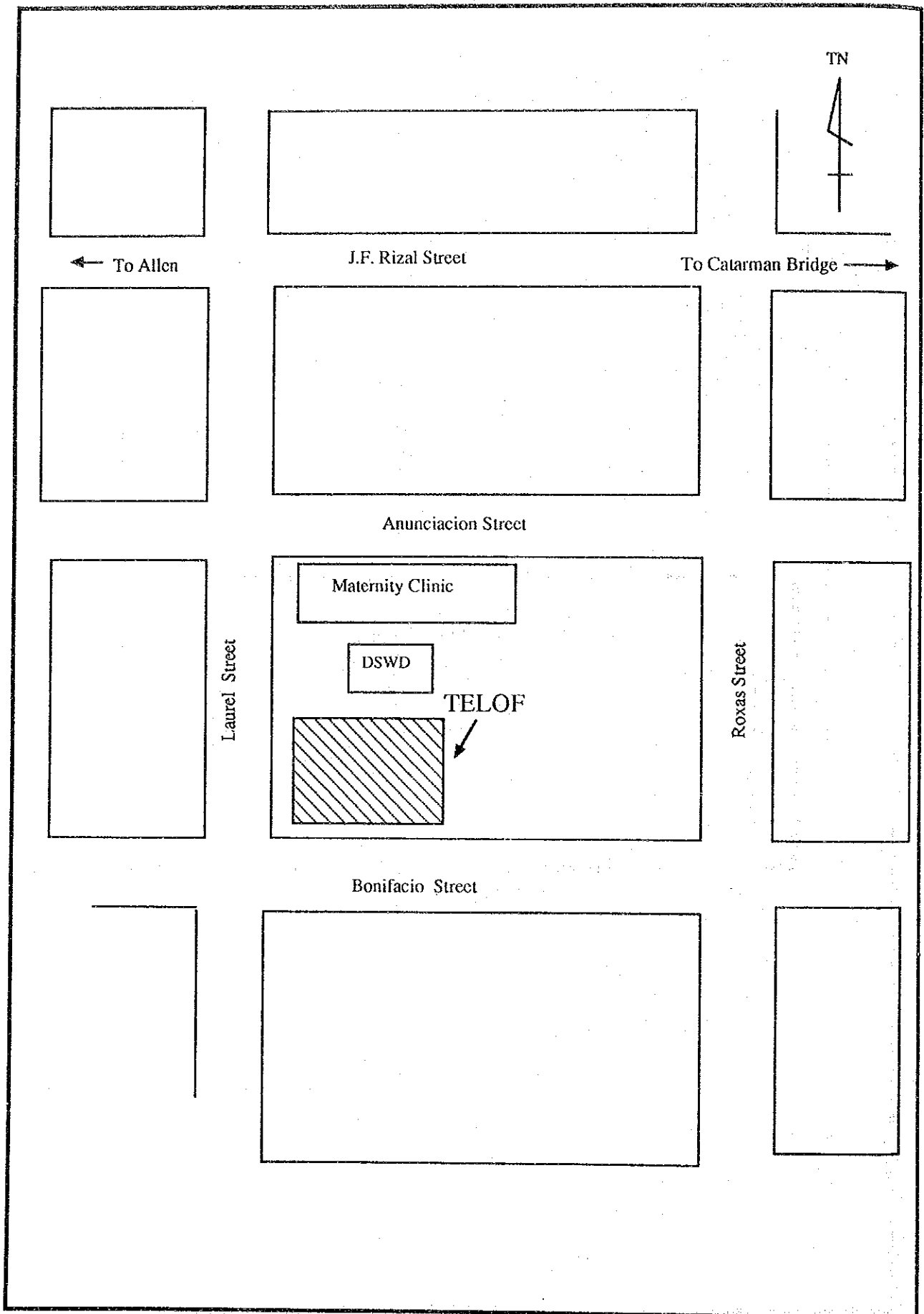


Azimuth: 227.5°

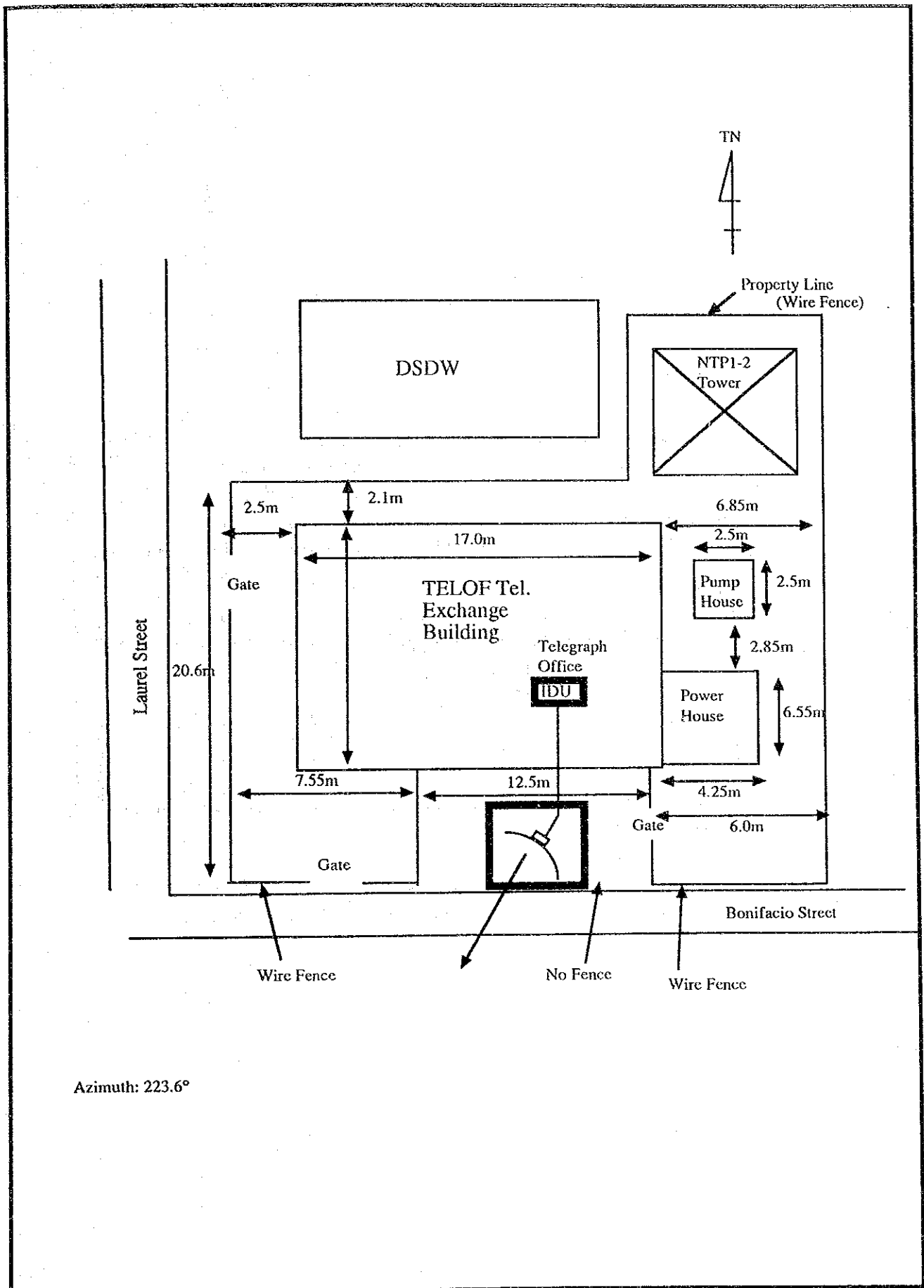
Floor Layout (Tacloban-3/3,Region VIII)



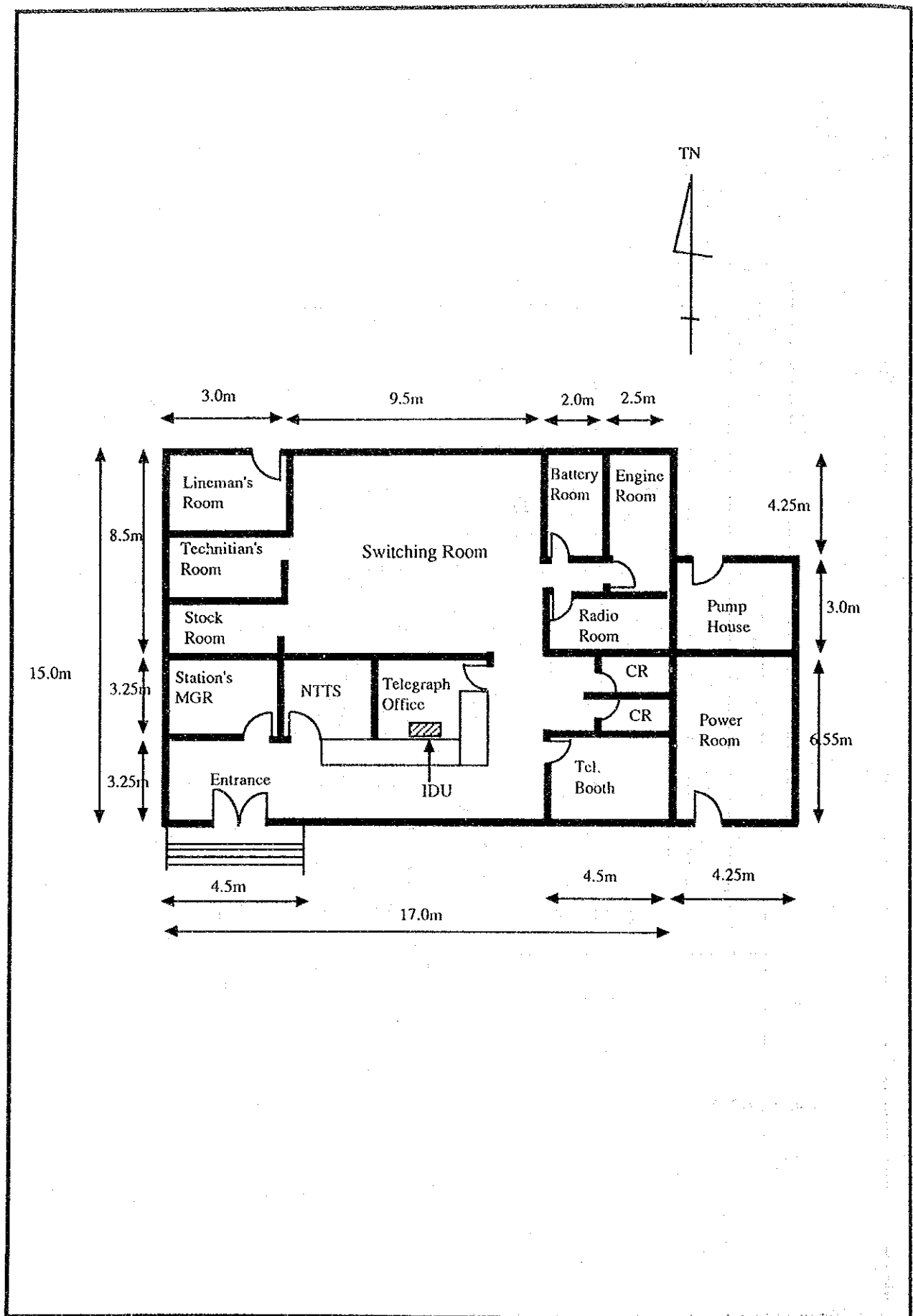
Guide Map (Catarman-1/3, Region VIII)



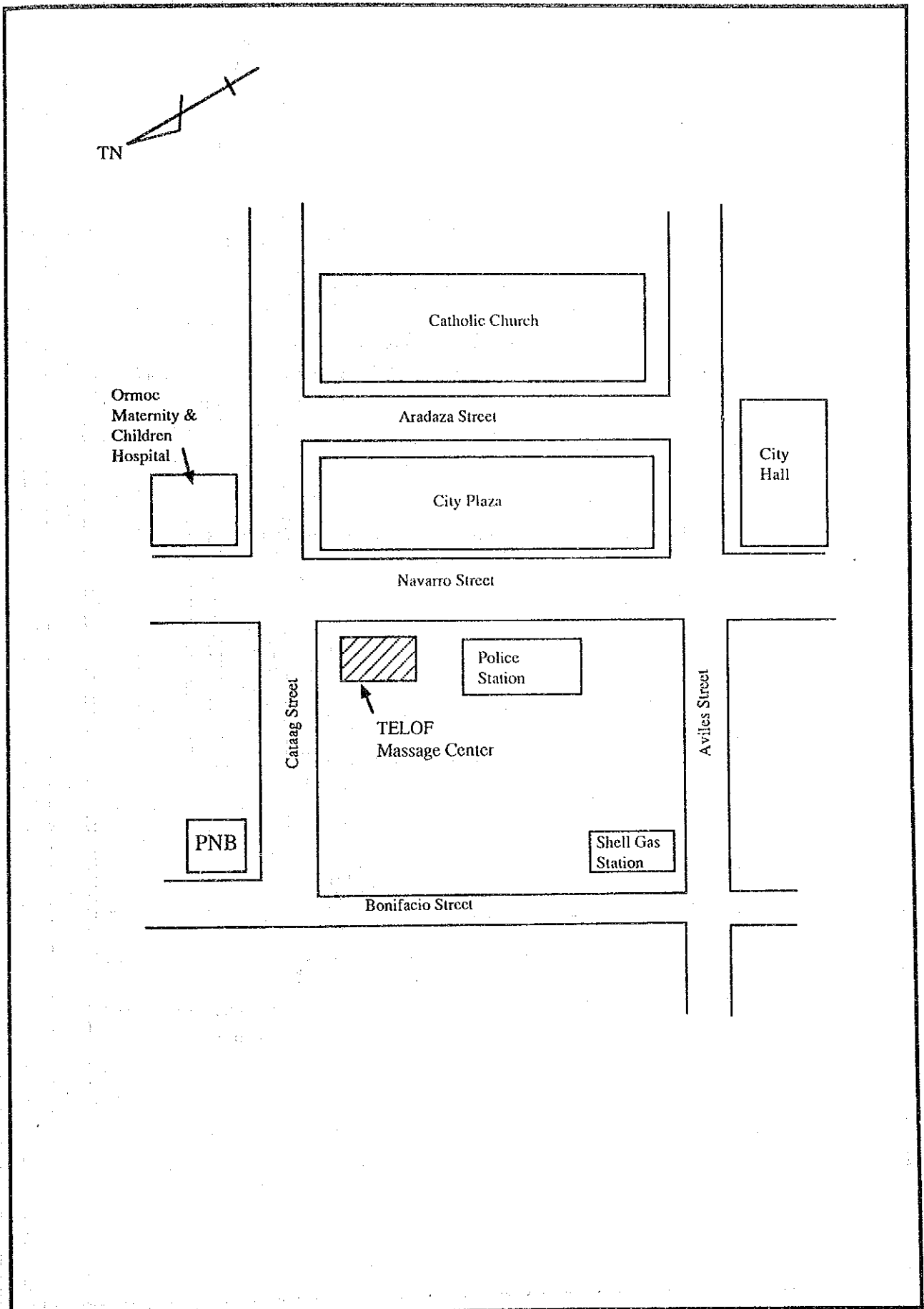
Site Layout (Catarman-2/3, Region VIII)



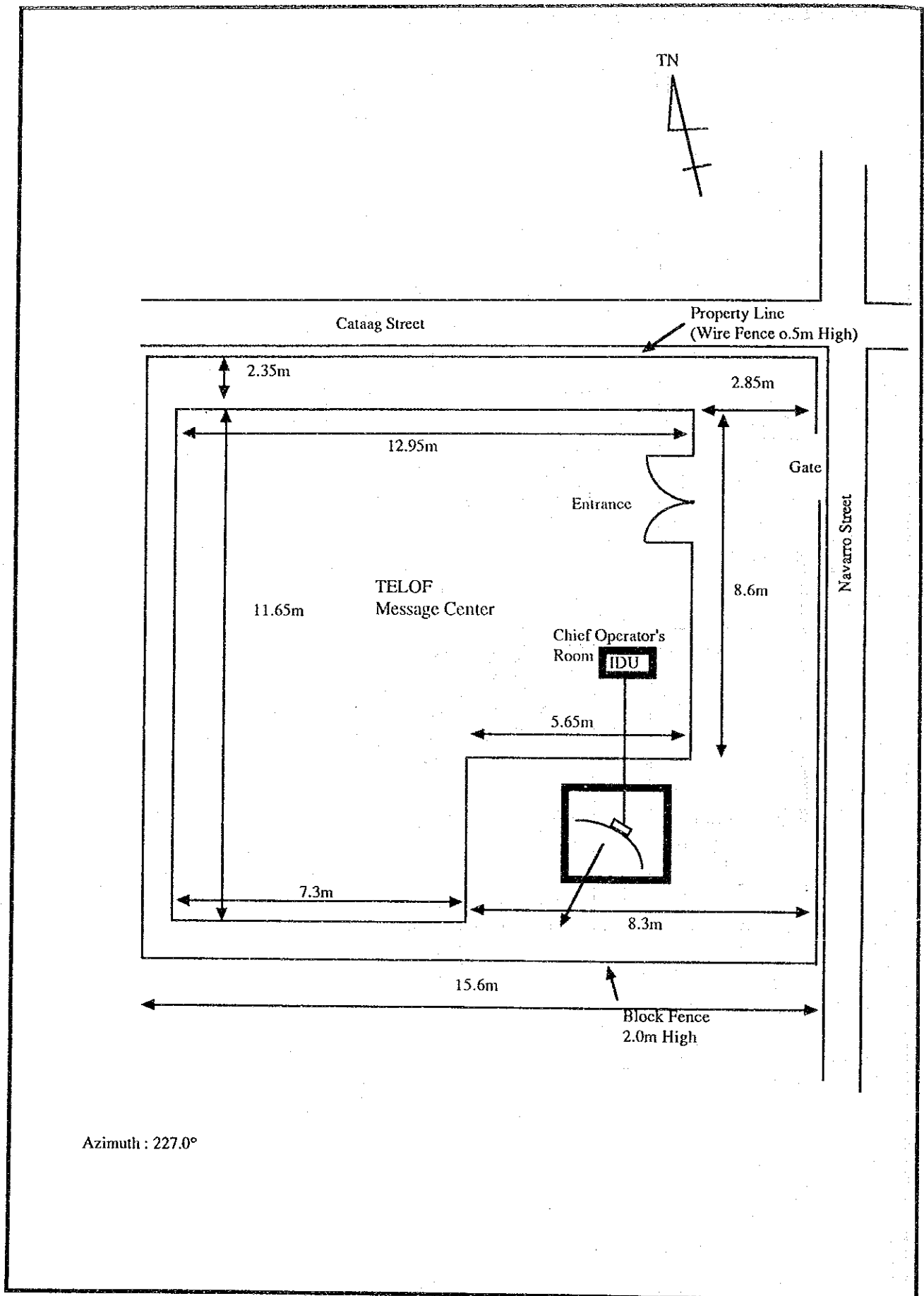
Floor Layout (Catarman-3/3, Region VIII)



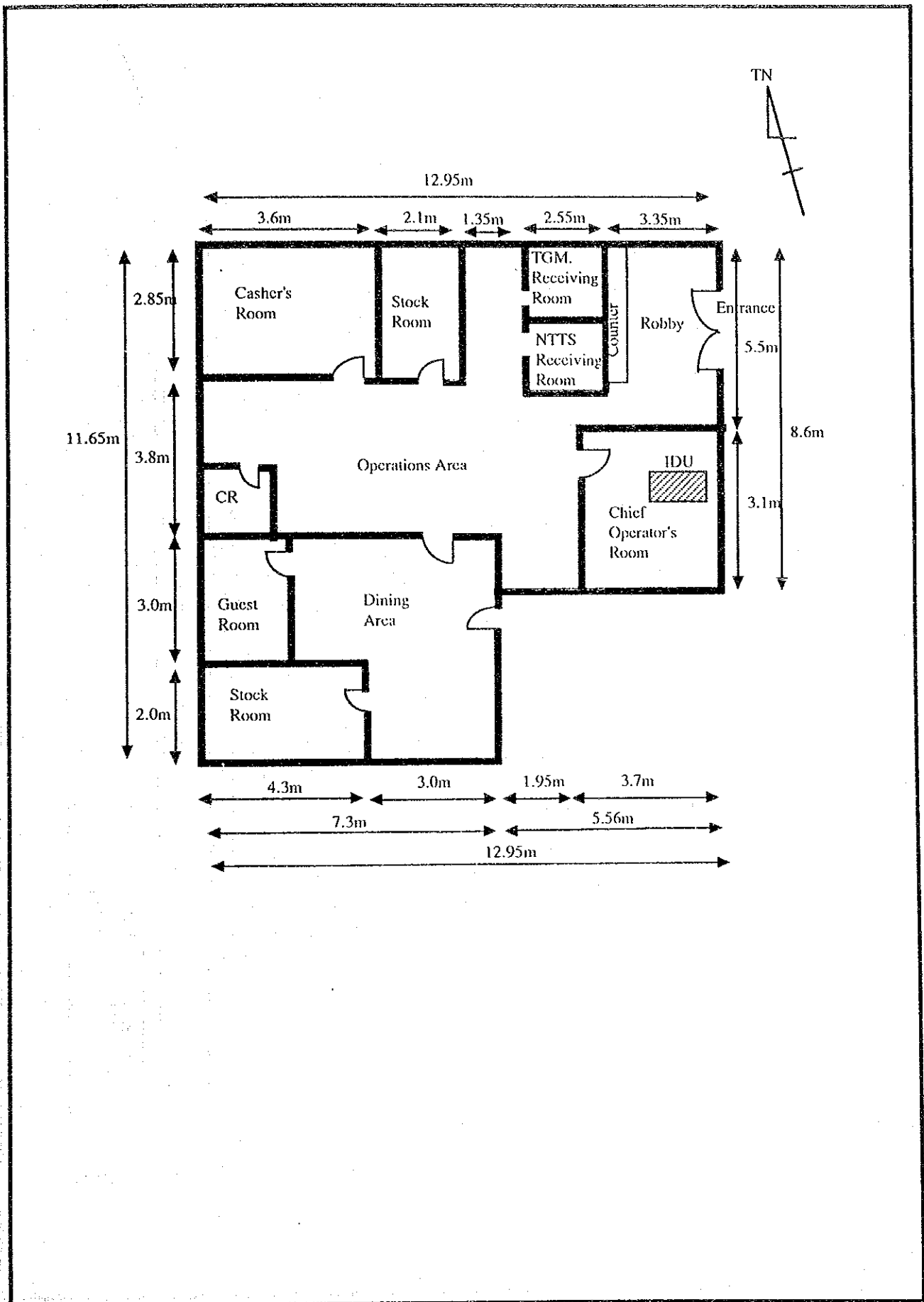
Guide Map (Ormoc-1/3, Region VIII)



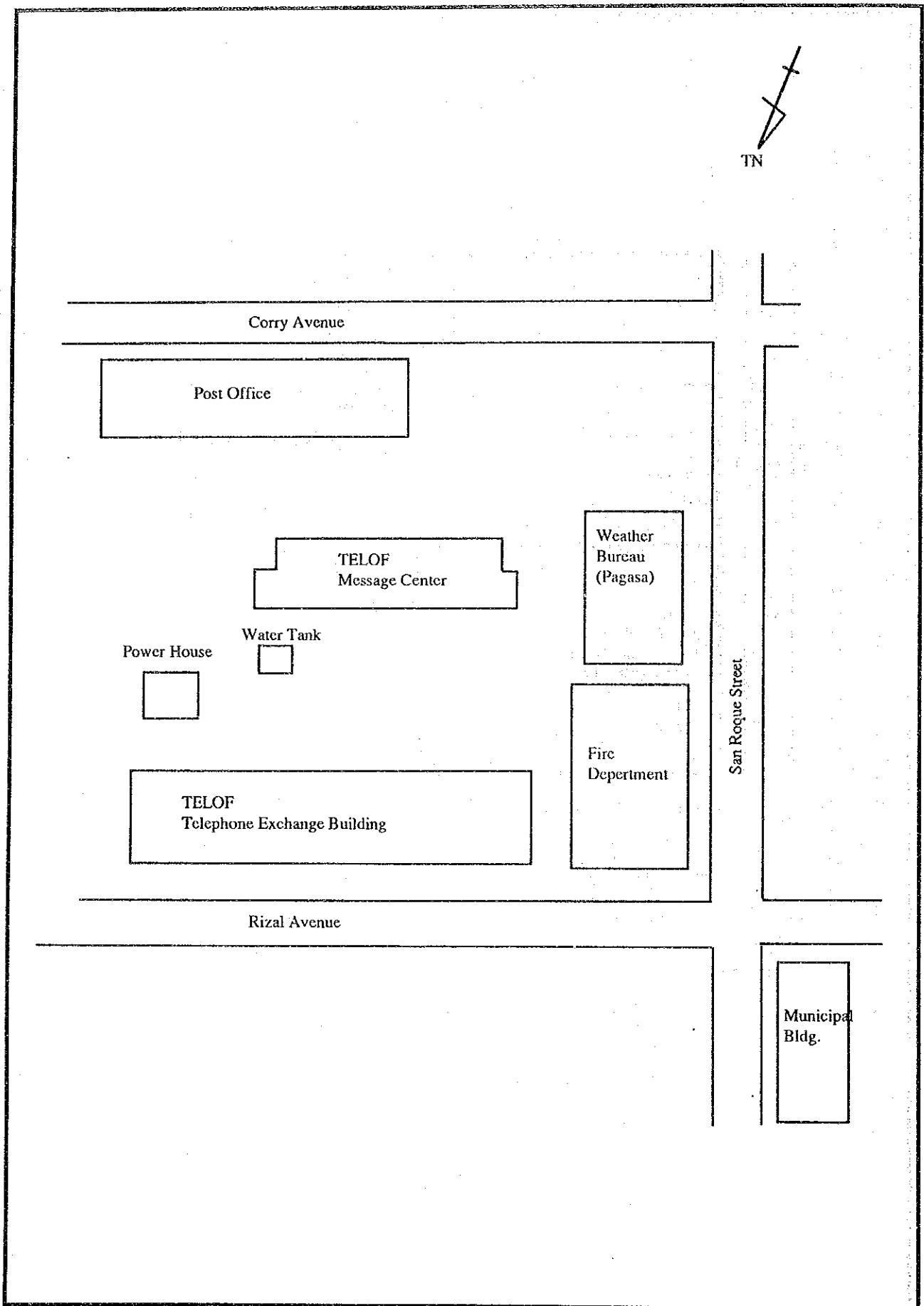
Site Layout (Ormoc-2/3, Region VIII)



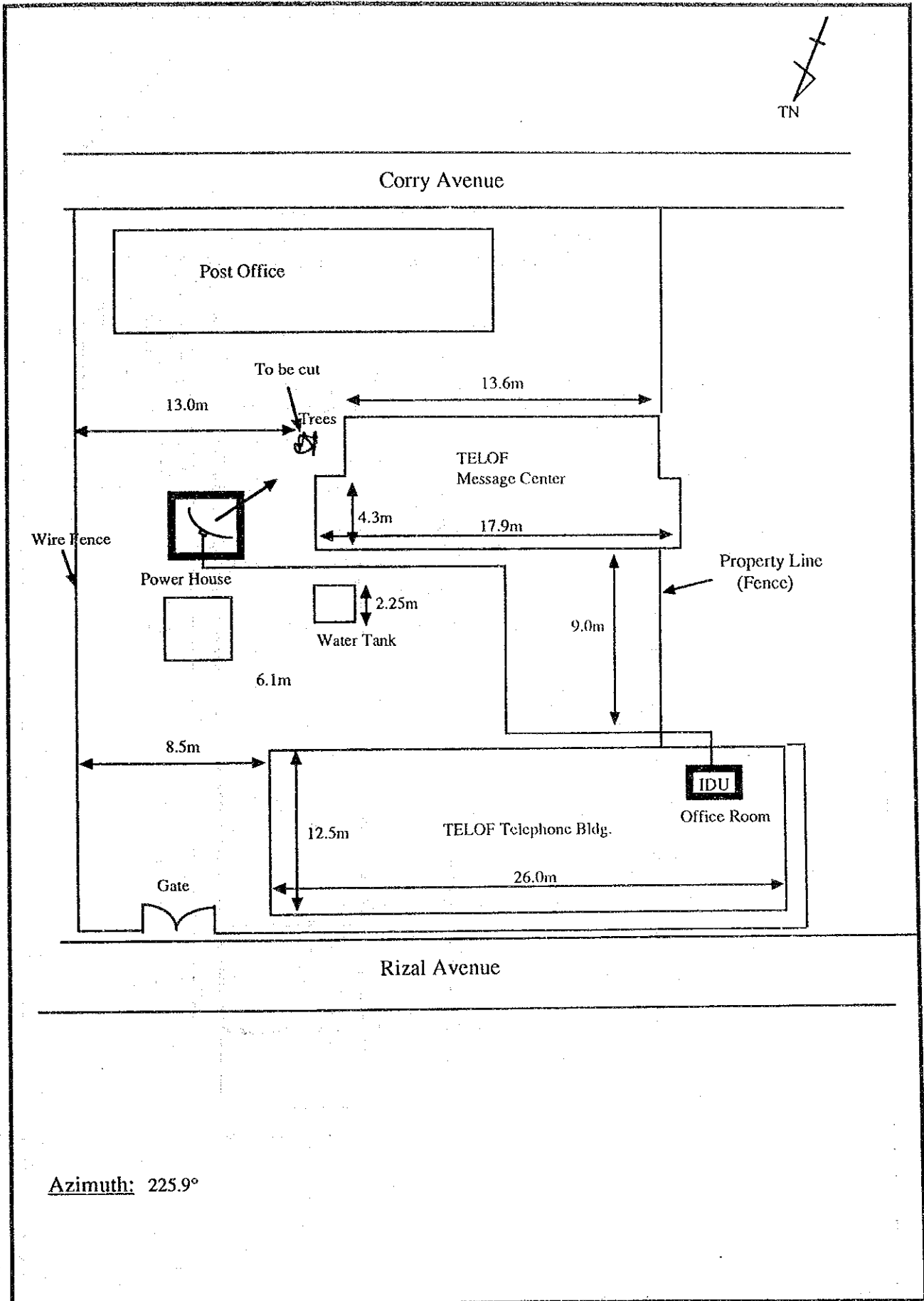
Floor Layout (Ormoc-3/3, Region VIII)



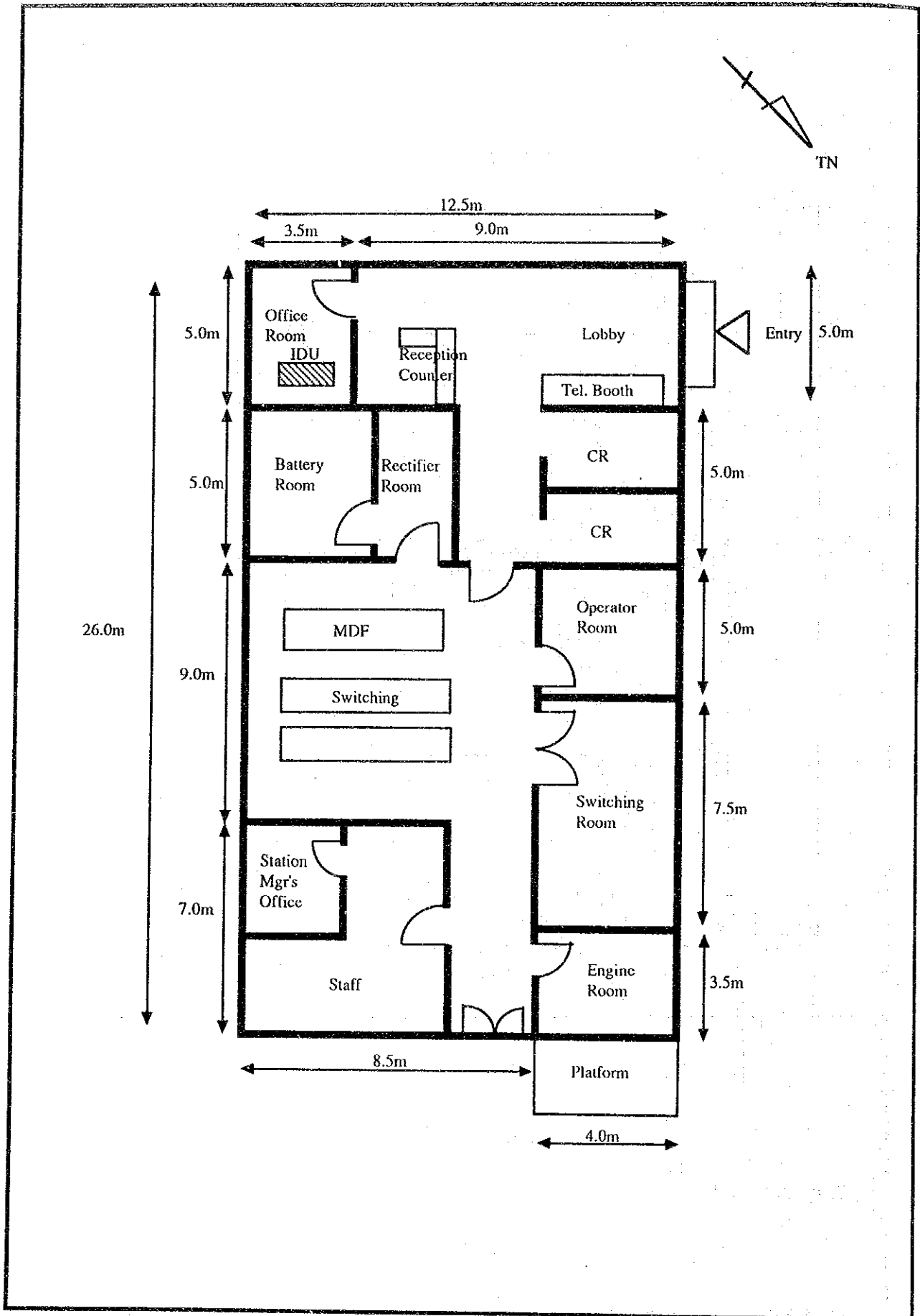
Guide Map (Catbalogan-1/3,Region VIII)



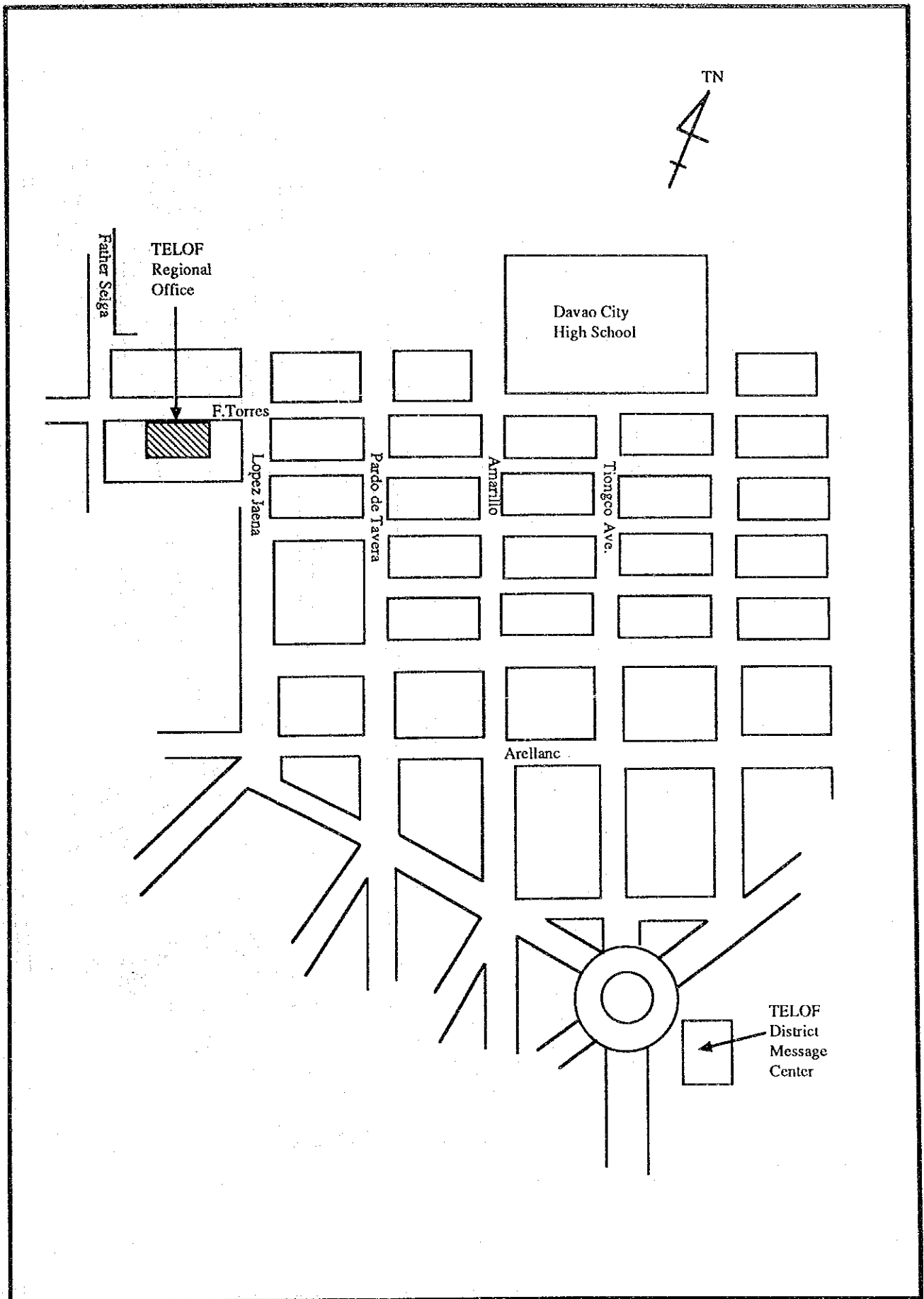
Site Layout (Catbalogan-2/3, Region VIII)



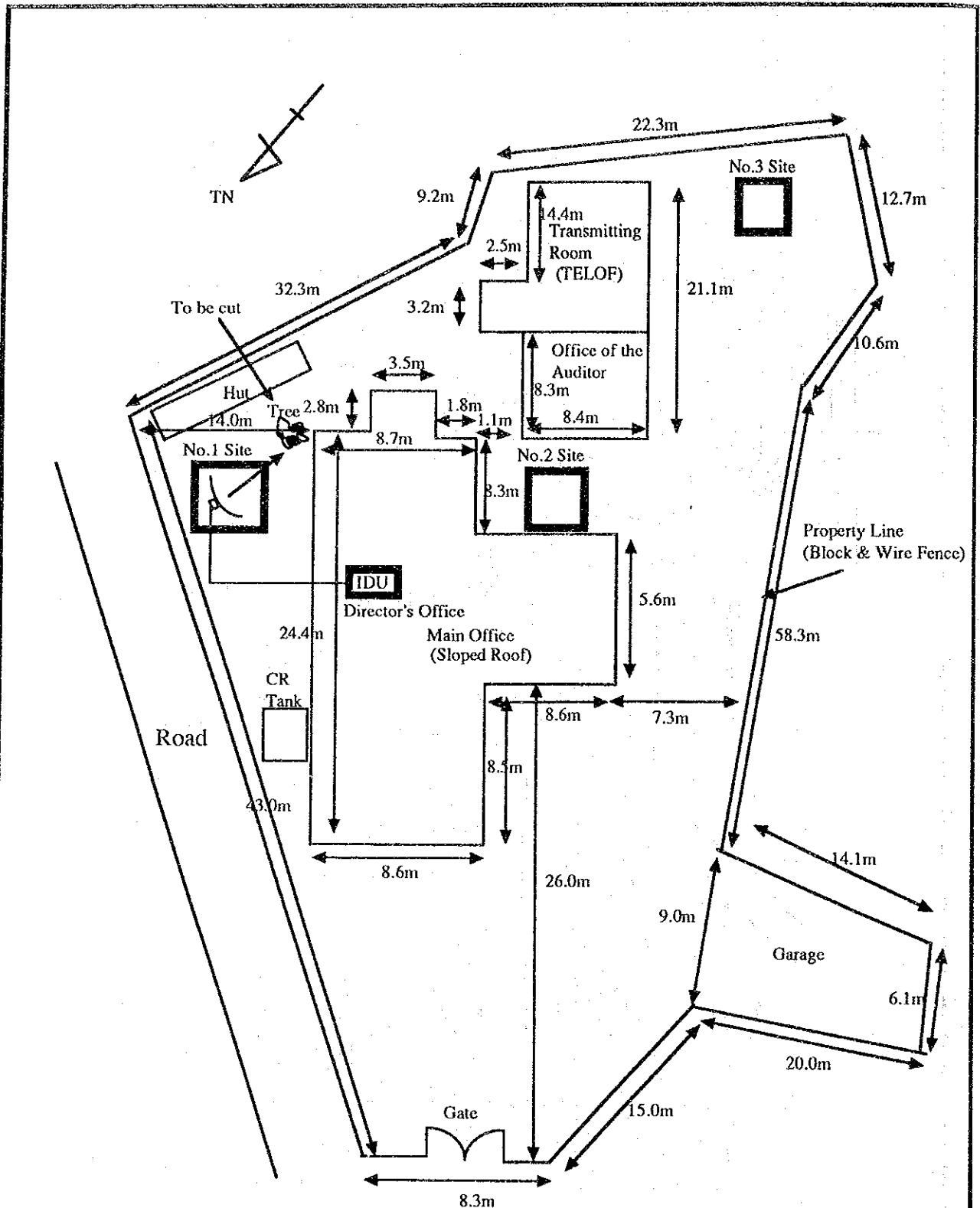
Floor Layout (Catbalogan-3/3, Region VIII)



Guide Map (Davao-1/3, Region XI)



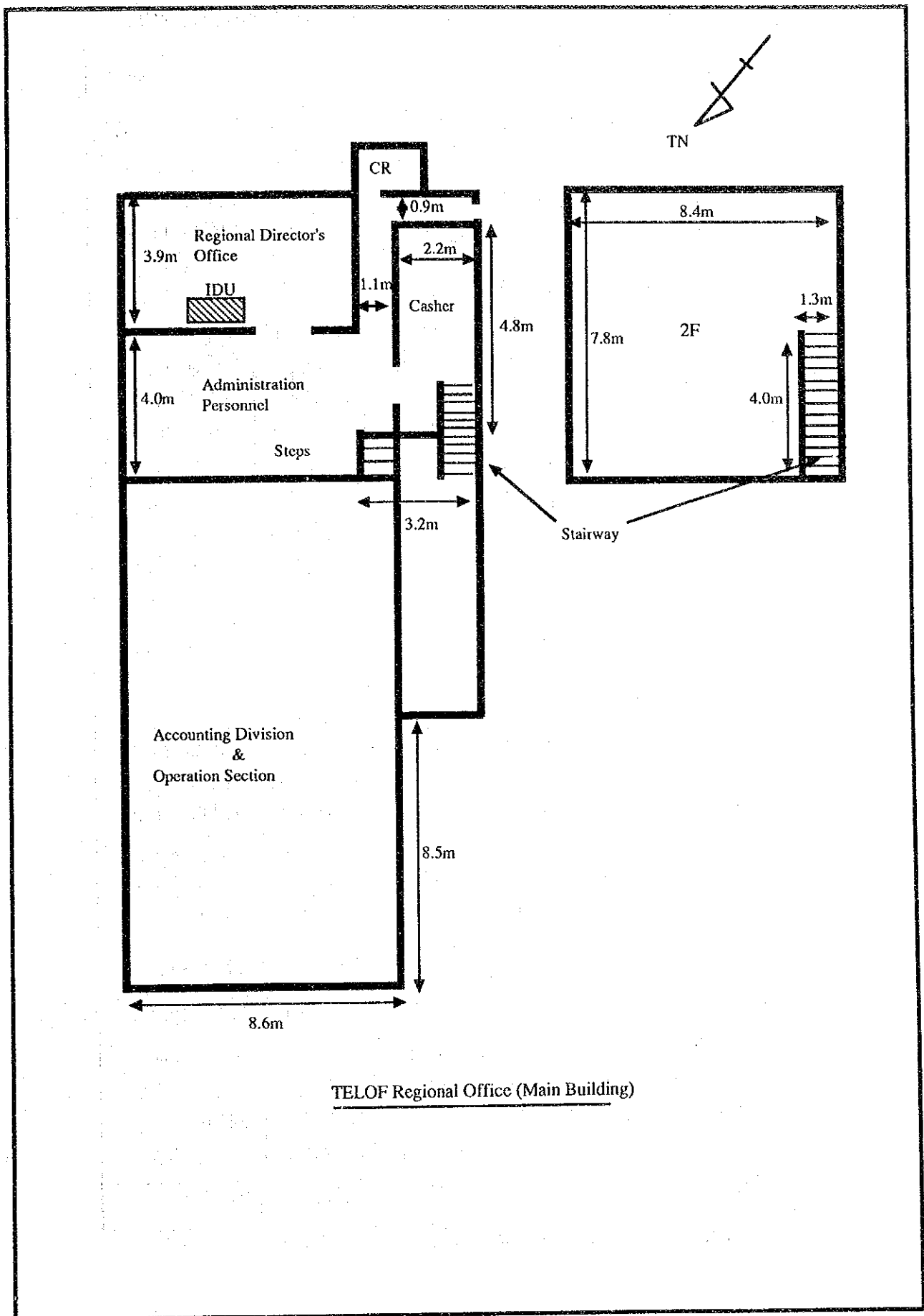
Site Layout (Davao-2/3, Region XI)



TELOF Regional Office (Region 11)

Azimuth: 241.2°

Floor Layout (Davao-3/3, Region XI)



TELOF Regional Office (Main Building)

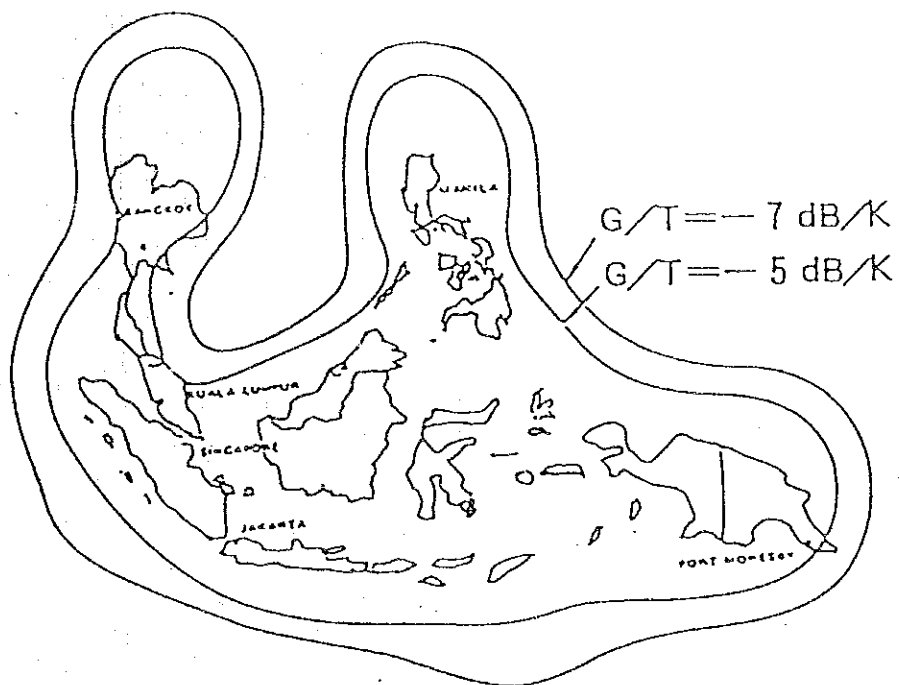
ANNEX 7 Data for System Design

ANNEX 7-1 Elevation angle and Azimuth to PALAPA Satellite

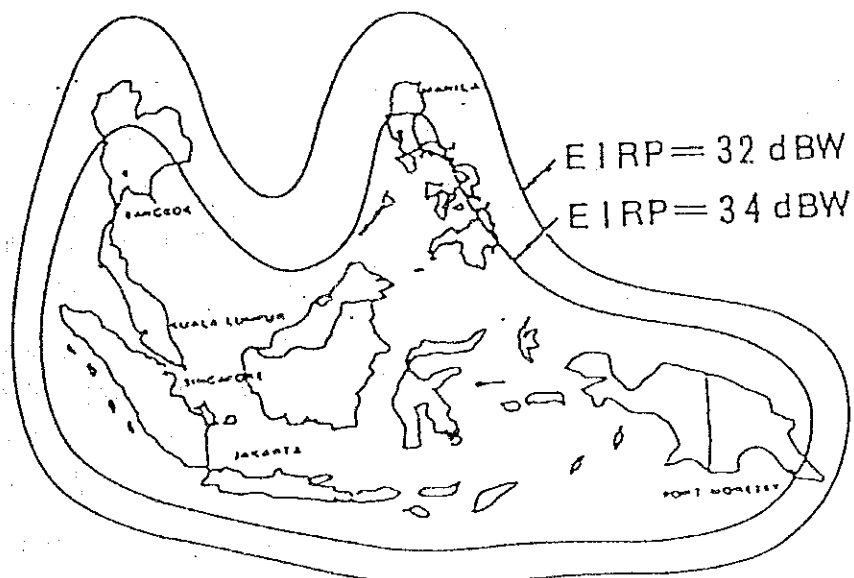
VSAT Locations			VSAT Station		Elevation and Azimuth(deg.)	
No		Region	Latitude	Longitude	Elevation	Azimuth from TN
1	Laoag	1	18° 11'	120° 35'	67.0/68.5	203.1/ 188.2
2	Vigan		17° 34'	120° 23'	67.7/69.2	203.2/ 187.9
3	Bagio		16° 24'	120° 36'	68.8/70.5	205.3/ 189.1
4	Lingayen		16° 00'	120° 14'	69.4/71.0	204.7/ 188.1
5	San Fernando		16° 36'	120° 19'	68.8/70.3	204.2/ 188.1
6	Aparri	2	18° 22'	121° 37'	66.3/68.1	205.7/ 191.3
7	Tugegarao		17° 37'	121° 42'	67.0/68.9	206.8/ 192.1
8	Ilagan		17° 08'	121° 53'	67.4/69.4	207.9/ 193.0
9	Bayombong		16° 28'	121° 08'	68.5/70.3	206.8/ 190.9
10	Cabanatuan	3	15° 30'	120° 58'	69.6/71.5	207.6/ 191.0
11	Tarlac		15° 30'	120° 35'	69.8/71.5	206.5/ 189.6
12	Iba		15° 20'	119° 59'	70.3/71.8	204.9/ 187.5
13	Malolos		14° 51'	120° 49'	70.3/72.2	208.2/ 190.9
14	Manila	NCR	14° 35'	121° 03'	70.5/72.5	209.3/ 191.9
17						
18	Lucena	4	13° 56'	121° 37'	70.8/73.1	212.2/ 194.7
19	Batangas		13° 46'	121° 04'	71.3/73.4	210.8/ 192.7
20	Boac		13° 27'	121° 50'	71.2/73.6	213.7/ 196.1
21	Romblon		12° 35'	122° 16'	71.7/74.4	216.8/ 198.9
22	Legaspi	5	13° 07'	123° 45'	70.2/73.2	219.9/ 203.9
23	Naga		13° 37'	123° 11'	70.1/72.9	217.3/ 201.1
24	Virac		13° 35'	124° 13'	69.4/72.5	220.2/ 204.9
25	Iloilo	6	10° 43'	122° 34'	73.2/76.3	222.2/203.2
26	Cebu	7	10° 18'	123° 53'	72.4/76.1	227.1/210.0
27	Catarman	8	12° 30'	124° 38'	70.0/73.4	223.6/ 208.2
28	Tacloban		11° 15'	125° 00'	70.7/74.4	227.5/ 212.2
29	Ormoc		11° 01'	124° 36'	71.3/74.9	227.0/ 211.2
30	Catbalogan		11° 47'	124° 54'	70.4/74.0	225.9/ 210.7
31	Davao	11	07° 04'	125° 36'	73.1/77.8	241.2/227.3

Note : DOTC, NTC, TTI and Malacanang are included in Manila.

ANNEX 7-2 PALAPA B Coverage



Receive



Transmit

ANNEX 7-3 Example of Satellite Budget

System parameter

Item	Parameter	Unit
Satellite Longitude	113	Deg.
Frequency Band	4/6	GHz
SFD	-86.5	dBW/ m ²
Input Backoff	8.0	dB
Output Backoff	4.0	dB
Satellite EIRP	33.0	dBW
Satellite G/T	-5.0	dB/K
Number of circuits	15.0	CH
CODEC	32Kbps ADPCM	
Transmit. Band Width	45.0	KHz
Satellite Band Width	4.138	KHz
Required C/N	6.0	dB

Hub, VSAT Parameter

Item	Hub St.	VSAT St.	Unit
Latitude	14.35	18.22	Deg.
Longitude	121.03	121.37	Deg.
Antenna Diameter	7.6	1.8/2.4	m
SSPA output	50.0	5.0	W
Feeder Loss	1.4	0.5	dB
HPA Backoff	8.0	4.0	dB
Antenna P. Error	0.5	0.2	dB

Example of calculation

Item	Unit	Hub St. ---> VSAT St. (7.6m ϕ) (1.8m ϕ)	VSAT St. ---> Hub St. (1.8m ϕ) (7.6m ϕ)
Up Link			
Earth. EIRP	dBW	45.2	37.7
F. Space Loss	dB	199.1	199.2
ANT. P. Error	dB	0.5	0.2
Sat. G/T	dB/k	-5.0	-5.0
C/N	dB	22.7	15.4
Down Link			
Sat. EIRP	dBW	5.0	-2.5
F. Space Loss	dB	195.7	195.6
ANT. P. Error	dB	0.2	0.5
Earth. G/T	dB/K	16.1	28.6
C/N	dB	7.3	12.1
Total C/N		7.2	10.4
IM, CO-CH, XPD	dB	20.5	19.2
C/N+I	dB	7.0	9.9
Margin	dB	1.0	3.9
Item	Unit	Hub St. ---> VSAT St. (7.6m ϕ) (2.4m ϕ)	VSAT St. ---> Hub St. (2.4m ϕ) (7.6m ϕ)
Up Link			
Earth. EIRP	dBW	45.2	38.4
F. Space Loss	dB	199.1	199.2
ANT. P. Error	dB	0.5	0.2
Sat. G/T	dB/k	-5.0	-5.0
C/N	dB	22.7	16.1
Down Link			
Sat. EIRP	dBW	5.0	-1.8
F. Space Loss	dB	195.7	195.6
ANT. P. Error	dB	0.2	0.5
Earth. G/T	dB/K	18.6	28.6
C/N	dB	9.8	12.8
Total C/N	dB	9.6	11.1
IM, CO-CH, XPD	dB	20.5	19.4
C/N+I	dB	9.3	10.5
Margin	dB	3.3	4.5

ANNEX 8 Breakdown of the Expenses

1. Expenses for Maintenance and Operation of the System

(1) Running cost Subtotal 6,817 thousand pesos

(i) Lease charge for 1/8 transponder 4,414 thousand pesos/year
(US\$ 176,000)

(ii) Lease charge for tie lines 90 thousand pesos/year
- 6 sites in Metro Manila

Earth Station	Site	No. of Circuits	Direct Distance(Km)
Hub Station	NDCC	4W x 1	4
	DOH	4W x 1	5
	DPWH	4W x 1	8
	DSWD	4W x 1	9
	PNRC	4W x 1	8
	DILG	4W x 1	7

Unit: Lease charge 2W x 1: 61.26 pesos/Km
 4W x 1: 122.52 pesos/Km

(iii) Electricity fees for the Hub station and all VSAT stations
1,205 thousand pesos/year

Power consumption for Hub equipment 20 KW
Power consumption for VSAT equipment 1 KW/station

Unit: Generation charge 2.25 pesos/KWH/Month
 Demand charge 25 pesos/KW
 Energy charge 0.45 pesos/KWH

- (iv) Cost of E/G fuel 243 thousand pesos/year
- Average power failure hours 408 hours/year
 Fuel consumption for Hub station 12 liter/hour
 Fuel consumption for VSAT station 1.5 liter/hour/station
- Unit: Fuel cost 11 pesos/liter (diesel)
 7 pesos/liter (gasoline)
- (v) Cost of consumable materials 100 thousand pesos/year
 Roll paper for facsimile machines and other consumable materials (fuse, etc.)
- (vi) Expenses for transportation and setting in emergency and practices 469 thousand pesos/year
 Transportation and setting: 4 times/year
 (2 weeks for 2 VSAT stations/time)
- (vii) Repair cost 296 thousand pesos/year
 Expenses for repairs and replacement of faulted printed circuit board and equipment
- (2) Manpower cost 446 thousand pesos/year
 - 6 TELOF engineers for operation and maintenance
 (Unit: 74,400 pesos/year/engineer)
- (3) Training cost Subtotal 113 thousand pesos/year
- (i) Training at TTI 57 thousand pesos/year
 15 personnel for 10 days , 2 times/year
- (ii) OJT 56 thousand pesos/year
 31 times/year by an instructor from TTI
 (1 time/year/station)

2. Expenses for the Installation Work of the System by the Philippines

(1) Hub station and relevant organizations in Metro Manila

(i) Installation charge for tie lines (6 sites) 36 thousand pesos

- 4W x 1 tie line each

in NDCC, DOH, DPWH, DSWD, PNRC, DILG

Unit: 2,970 peso/2W circuit

(ii) Installation of terminal equipment 597 thousand pesos

- materials for 7 terminals 3 thousand pesos

(The installation carried out by TELOF personnel)

- Inband Ringer (IBR) & UPS 594 thousand pesos

In case tie lines conditions are not sufficient, IBR & UPS are applied to the tie lines in the above 6 sites.

(2) 31 VSAT stations

(i) Land leveling (24 sites) 39 thousand pesos

(ii) Cutting trees (5 sites) 23 thousand pesos

(iii) Fence (26 sites: W:5m, H: 2m) 2,344 thousand pesos

(iv) Others (extension power cable, materials) 12 thousand pesos

