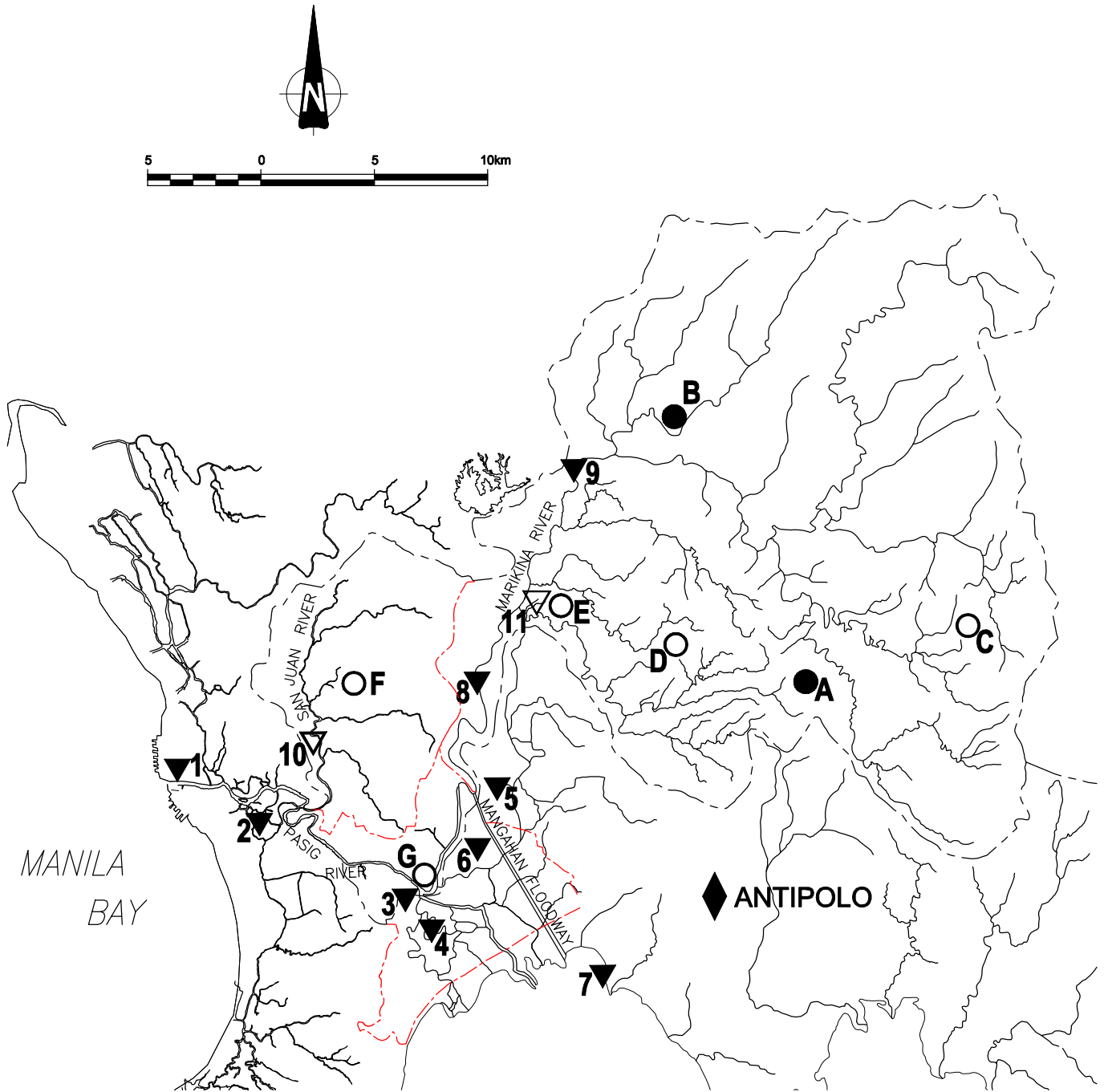


Figures

- Fig. 2-1 Location of Telemeterized Hydrological Stations
- Fig. 2-2 Location of Existing Hydrological Stations
- Fig. 2-3 Location of Drainage and Pump Stations in Metro Manila
- Fig. 2-4 Hourly Rainfall Regression Analysis Between Mt. Oro and Bosoboso
- Fig. 2-5 Regression Analysis on 3 Hour Rainfall
- Fig. 2-6 Water Level on Laguna Lake during Typhoon Rosing
- Fig. 2-7 Track of Typhoon Rosing (Oct.30-Nov.4, 1995)
- Fig. 2-8 Flood Warning/Information dissemination
- Fig. 2-9 Flood Forecasting and Warning Network
- Fig. 2-10 Telemetry System Configuration
- Fig. 2-11 Overall System Diagram of Metro Manila Flood Control
- Fig. 2-12 Multiplex Radio Communication Channel Plan
- Fig. 2-13 Emergency Radio Communication Network System
- Fig. 2-14 Hardware System Configuration
- Fig. 2-15 Configuration of Data Processing System
- Fig. 2-16 Mt.Aries Rainfall Station Location Plan
- Fig. 2-17 Mt.Campana Rainfall Station Location Plan
- Fig. 2-18 Science Garden Rainfall Station Location Plan
- Fig. 2-19 Napindan Rainfall Gauge Location Plan
- Fig. 2-20 San Juan Water-level Station Location Plan
- Fig. 2-21 Nangka Rainfall and Water-level Station Location Plan
- Fig. 2-22 NCR Relay Tower Location Plan
- Fig. 2-23 Rainfall Station Building Plan
- Fig. 2-24 San Juan Water-level Station Building Plan
- Fig. 2-25 Nangka Rainfall and Water-level Station Building Plan
- Fig. 2-26 NCR Relay Tower Standard Section Plan
- Fig. 2-27 Retaining Wall and Drainage Wall Standard Section Plan
- Fig. 2-28 Organization Chart of DPWH
- Fig. 2-29 Organization Chart of NCR
- Fig. 2-30 Organization Chart of EFCOS
- Fig. 3-1 Mobilization Route of Telemetry Equipment

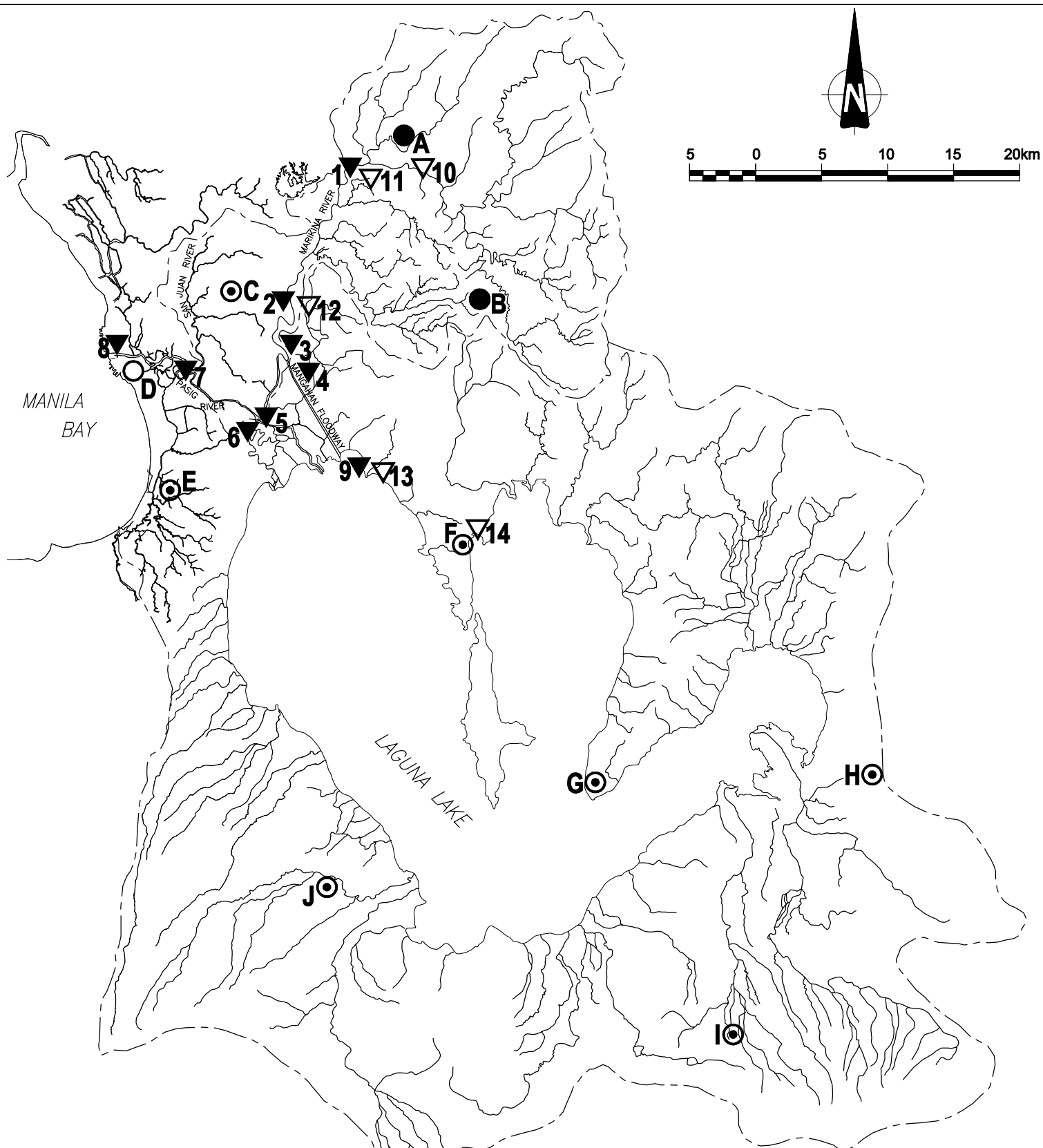


LEGEND

- EXISTING RAINFALL GAUGING STATION
- ▼ EXISTING WATER LEVEL GAUGING STATION
- ◆ EXISTING RELAY STATION
- PROPOSED RAINFALL GAUGING STATION
- ▽ PROPOSED WATER LEVEL GAUGING STATION

EXISTING		PROPOSED	
WATER LEVEL	RAINFALL	WATER LEVEL	RAINFALL
1: Fort Santiago	A: Boso Boso	10: San Juan	C: Mt. Campana
2: Pandacan	B: Mt. Oro	11: Nangka	D: Aries
3: Napindan HCS JS			E: Nangka
4: Napindan HCS LS			F: Science Garden
5: Rosario Weir JS			G: Napindan HCS
6: Rosario Weir LS			
7: Angono			
8: Sto. Nino			
9: Montalban			

Fig.2-1 LOCATION OF TELEMETERIZED HYDROLOGICAL STATIONS



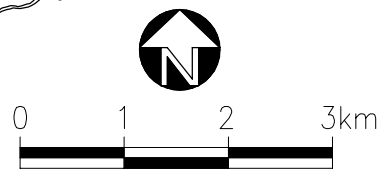
LEGEND

- ▼ Telemeterized Automatic Water Level Recorder
- ▽ Staff Gauge
- Telemeterized Automatic Rainfall Gauge
- ⊙ Automatic Rainfall Gauge
- Manual Rainfall Gauge

Water Level Station				Rainfall Station			
No.	Name	Operated by	Remarks	No.	Name	Operated by	Remarks
1	Montalban	EFCOS, DPWH		A	Mt. Oro	EFCOS, DPWH	
2	Sto. Nino	EFCOS, DPWH		B	Boso Boso	EFCOS, DPWH	
3	Rosario JS	EFCOS, DPWH		C	Science Garden	PAGASA	
4	Rosario LS	EFCOS, DPWH		D	Port Area	PAGASA	
5	Napindan JS	EFCOS, DPWH		E	NAIA	PAGASA	
6	Napindan LS	EFCOS, DPWH		F	Looc	LLDA	Operational since Dec., '98
7	Pandacan	EFCOS, DPWH		G	Punta	LLDA	Operational since Dec., '98
8	Ft. Santiago	EFCOS, DPWH		H	Caliraya	LLDA	Operational since Dec., '98
9	Angono	EFCOS, DPWH		I	Liliw	LLDA	Operational since Dec., '98
10	Wawa	NCR, DPWH	Discharge Measurement	J	Matang-Tubig	LLDA	Operational since Dec., '98
11	San Jose	NCR, DPWH	Discharge Measurement				
12	Sto. Nino	NCR, DPWH	Discharge Measurement				
13	Angono	NCR, DPWH					
14	Looc	LLDA					

Fig.2-2 LOCATION OF EXISTING HYDROLOGICAL STATIONS

MANILA BAY



LEGEND

- Ⓟ : EXISTING PUMP STATION
- 1 BINONDO
- 2 QUIAPO
- 3 AVILES
- 4 VALENCIA
- 5 PACO
- 6 PANDACAN
- 7 ESCOLTA
- 8 STA. CLARA
- 9 MAKATI
- 10 LIBERTAD
- 11 TRIPA DE GALLINA
- 12 BALUT
- 13 VITAS
- 14 SAN ANDRES
- 15 BALETE
- > : DRAINAGE MAIN/OUTFALL
- 1 BLUMENTRITT INTERCEPTOR
- 2 SOLIS-TECSON
- 3 PACHECO
- 4 LAKANDULA
- 5 ZURBARAN
- 6 SEVERINO REYES
- 7 LEPANTO-JOSEFINA
- 8 ECONOMIA
- 9 WASHINGTON-PIY MARGAL
- 10 VISAYAS
- 11 PADRE FAURA
- 12 REMEDIOS
- 13 SAN ANTONIO ABAD
- 14 VITO CRUZ
- 15 BUENDIA-ROXAS
- 16 LIBERTAD
- 17 EDSA
- 18 MAKATI HEADRACE I
- 19 MAKATI HEADRACE II
- 20 ESTRADA
- 21 ZOBEL ORBIT
- 22 FARADAY
- 23 ZOBEL-ROXAS MAIN

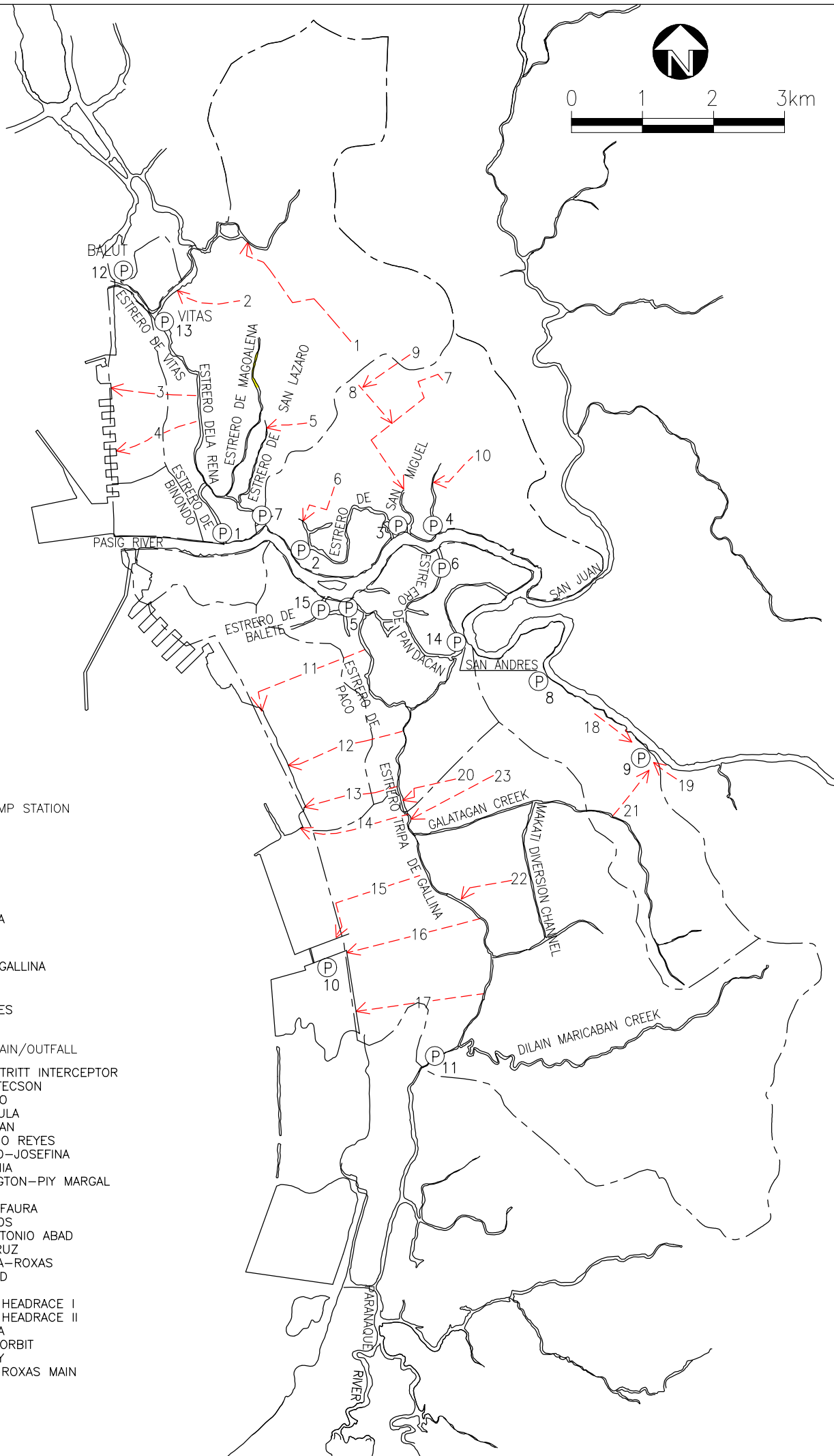
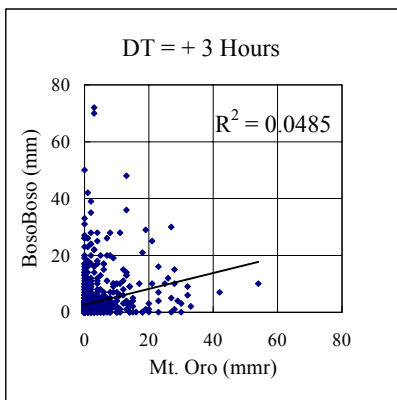
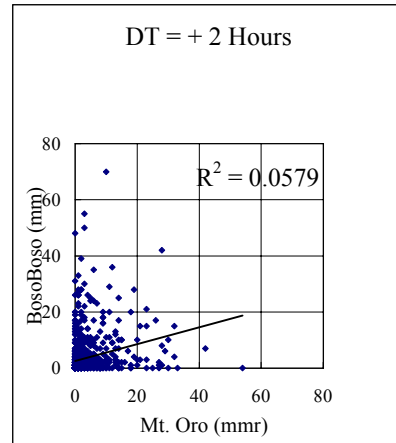
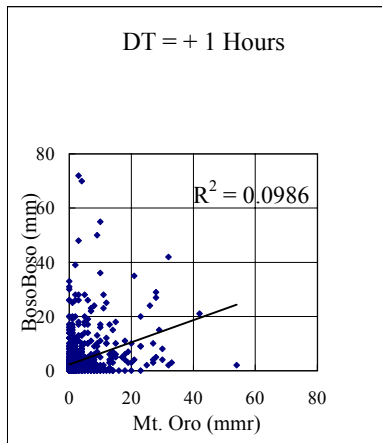
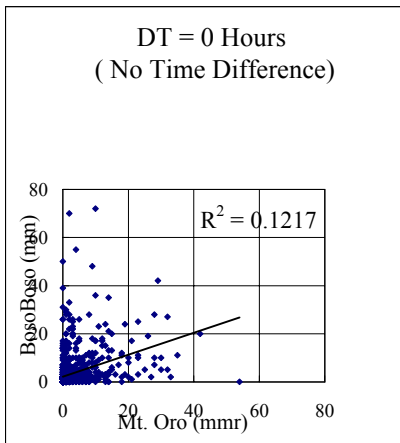
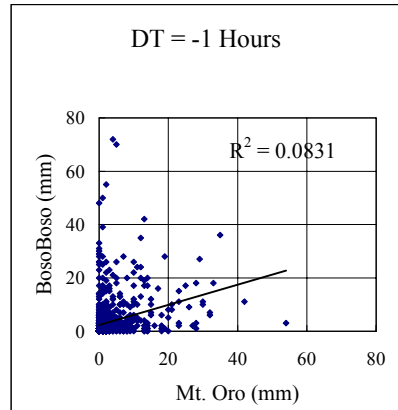
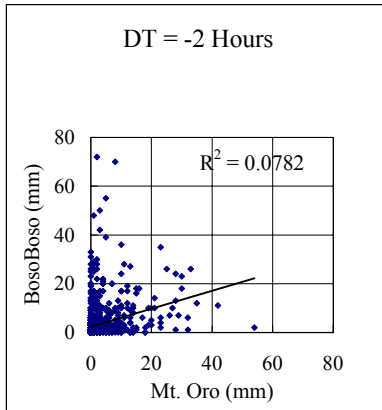
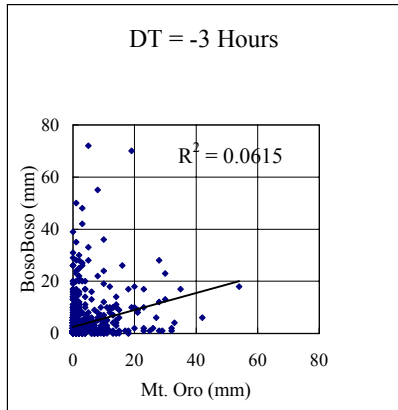


Fig. 2-3 LOCATION OF DRAINAGE AND PUMP STATIONS IN METRO MANILA



Note:

DT means time difference between hourly rainfall data of Mt. Oro and Bosoboso for the regression analysis. If DT=+2 hours, Mt. Oro is 2 hours ahead of Bosoboso.

Fig. 2-4 HOURLY RAINFALL REGRESSION ANALYSIS BETWEEN MT. ORO AND BOSOBOSO

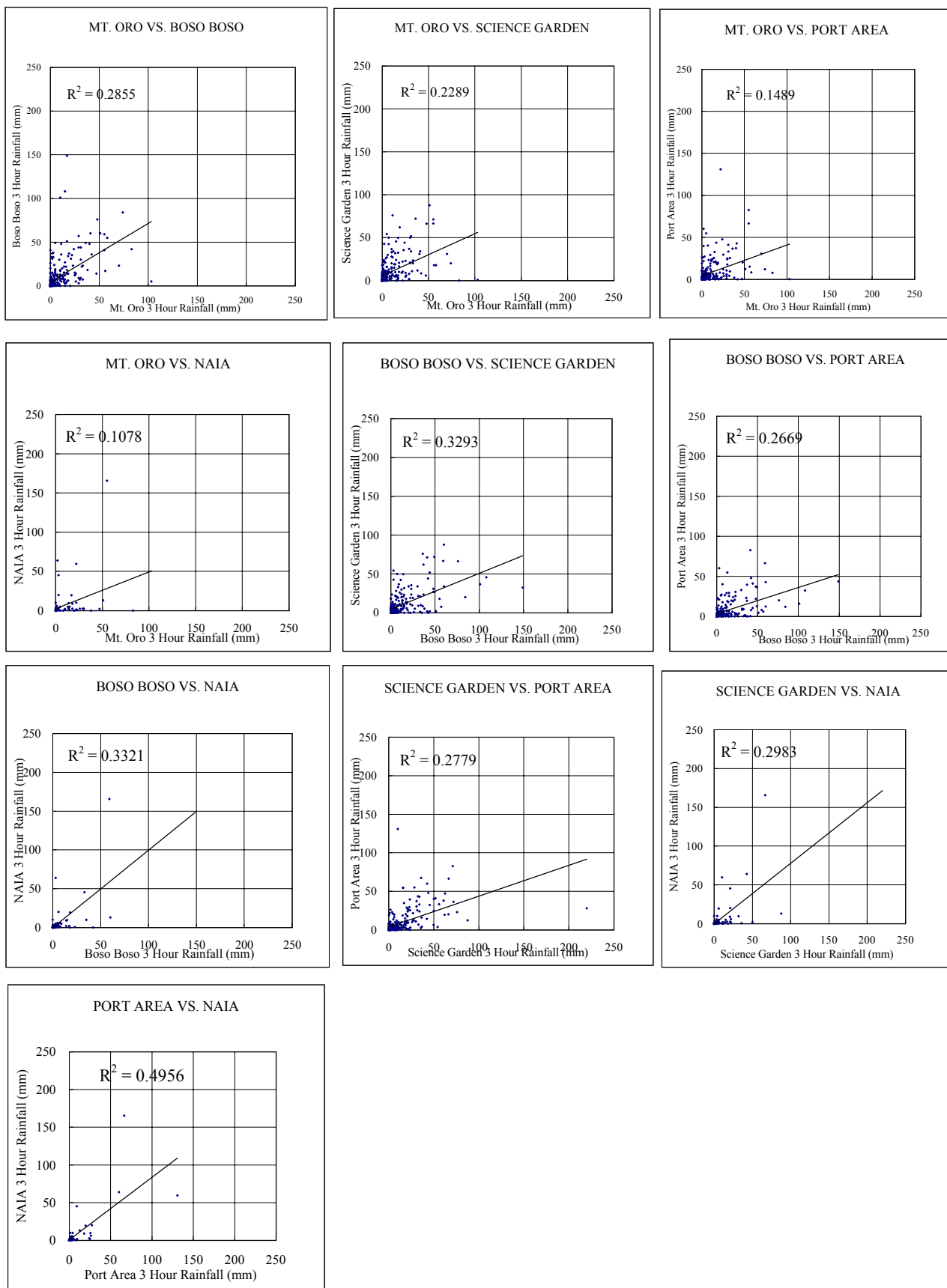


Fig. 2-5 REGRESSION ANALYSIS ON 3 HOUR

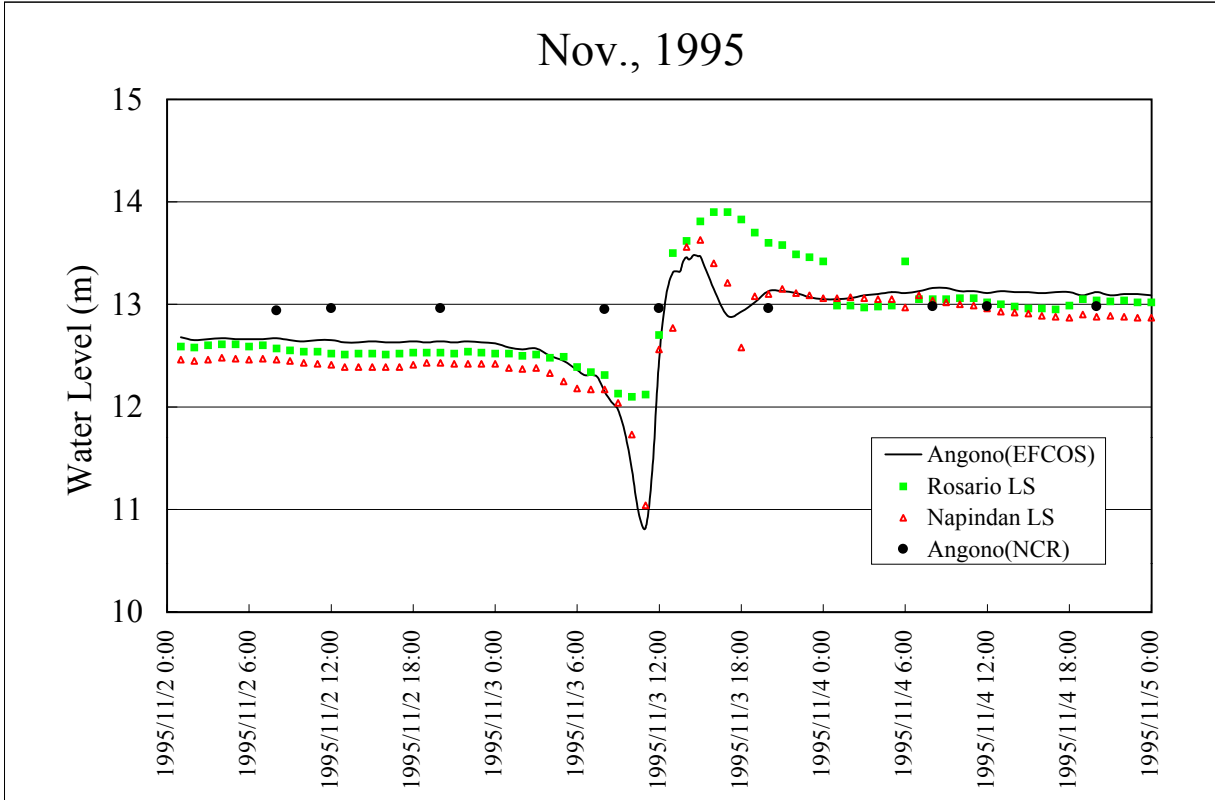
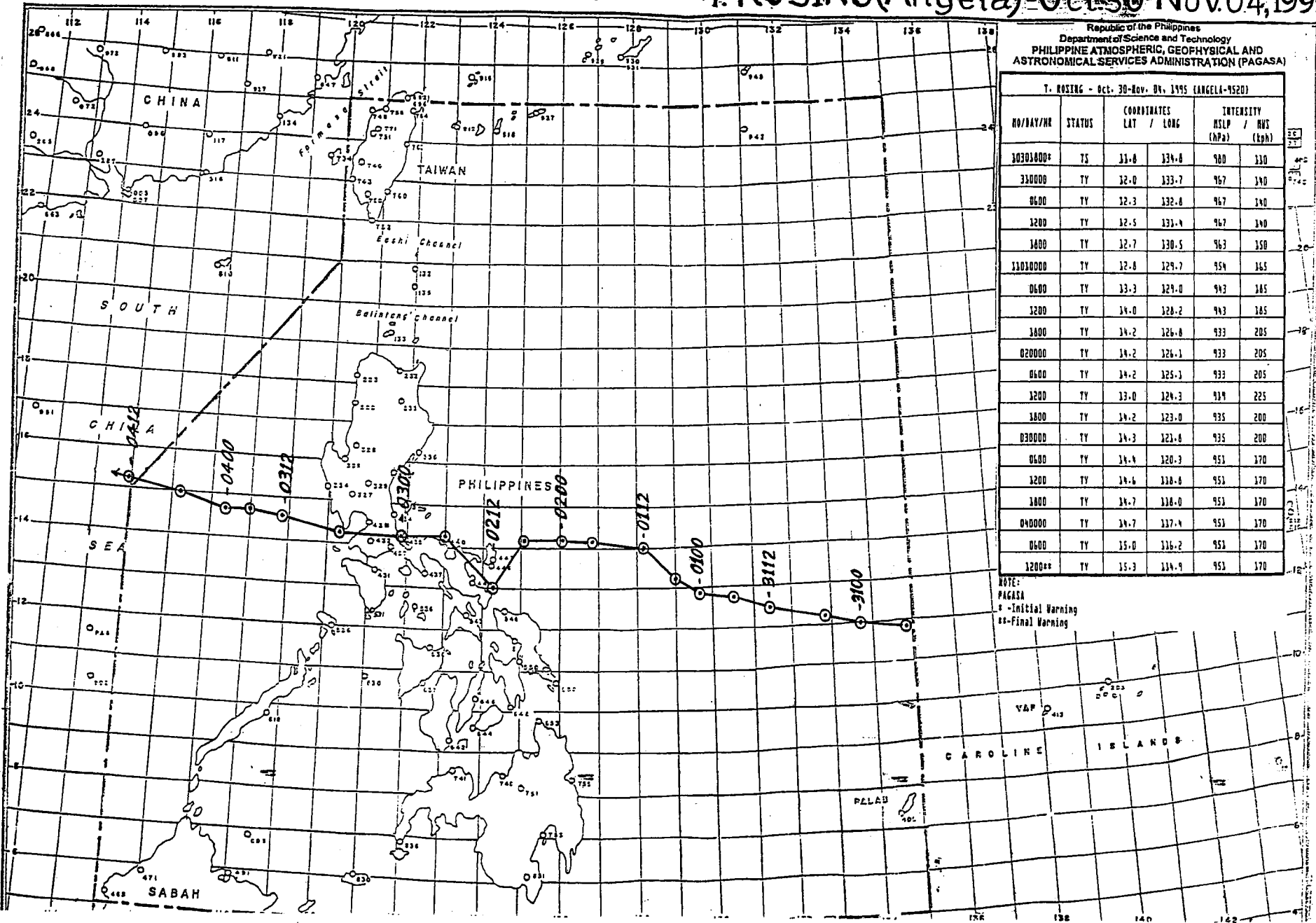


Fig 2-6. WATER LEVEL ON LAGUNA LAKE DURING TYPHOON ROSING

T. ROSING (Angela) - Oct.30 - Nov.04, 1995

Fig. 2-7 TRACK OF TYPHOON ROSING (OCT.30-NOV.4, 1995)



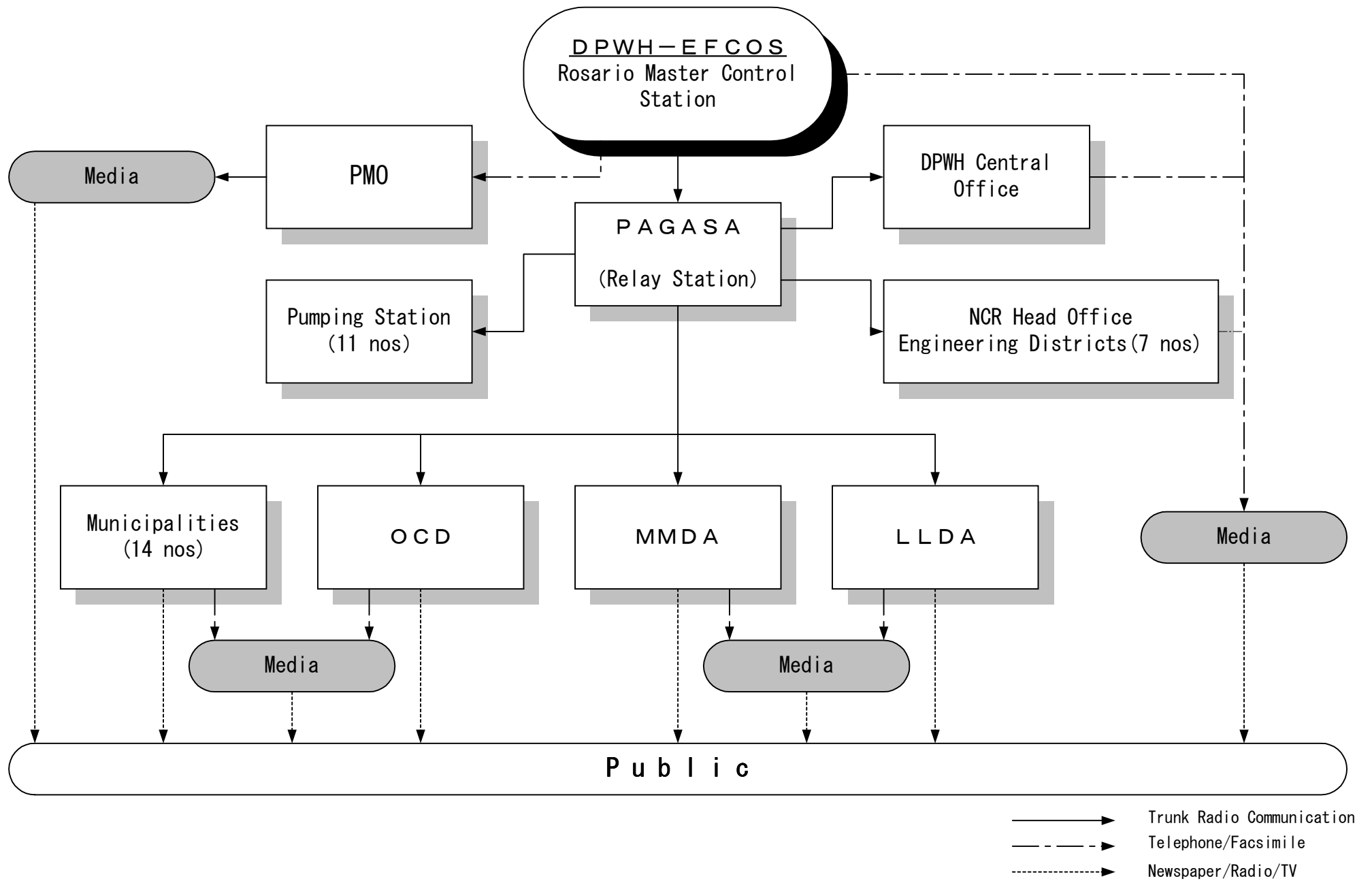


Fig. 2-8 FLOOD WARNING/INFORMATION DISSEMINATION

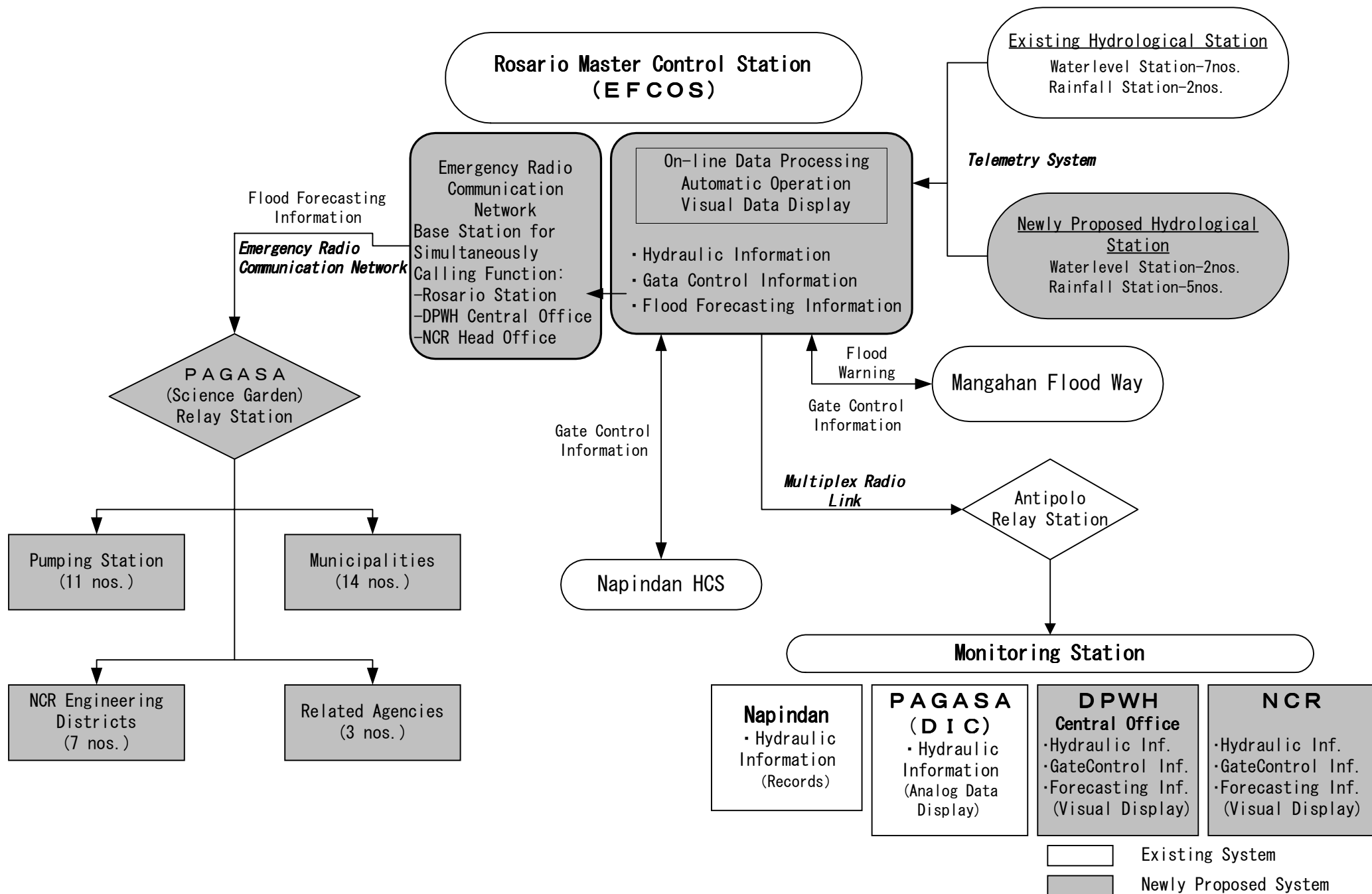
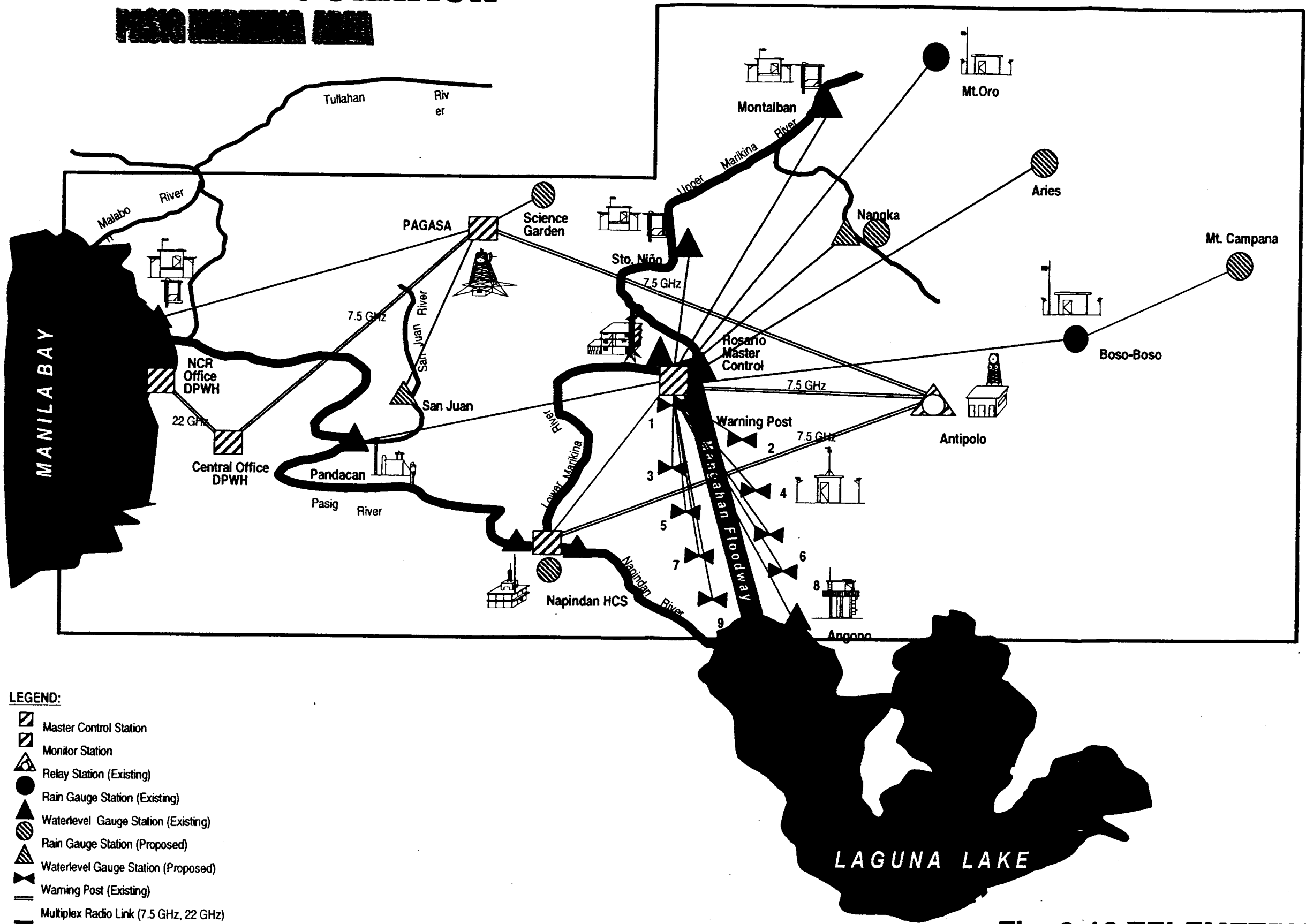


Fig. 2-9 FLOOD FORECASTING AND WARNING NETWORK

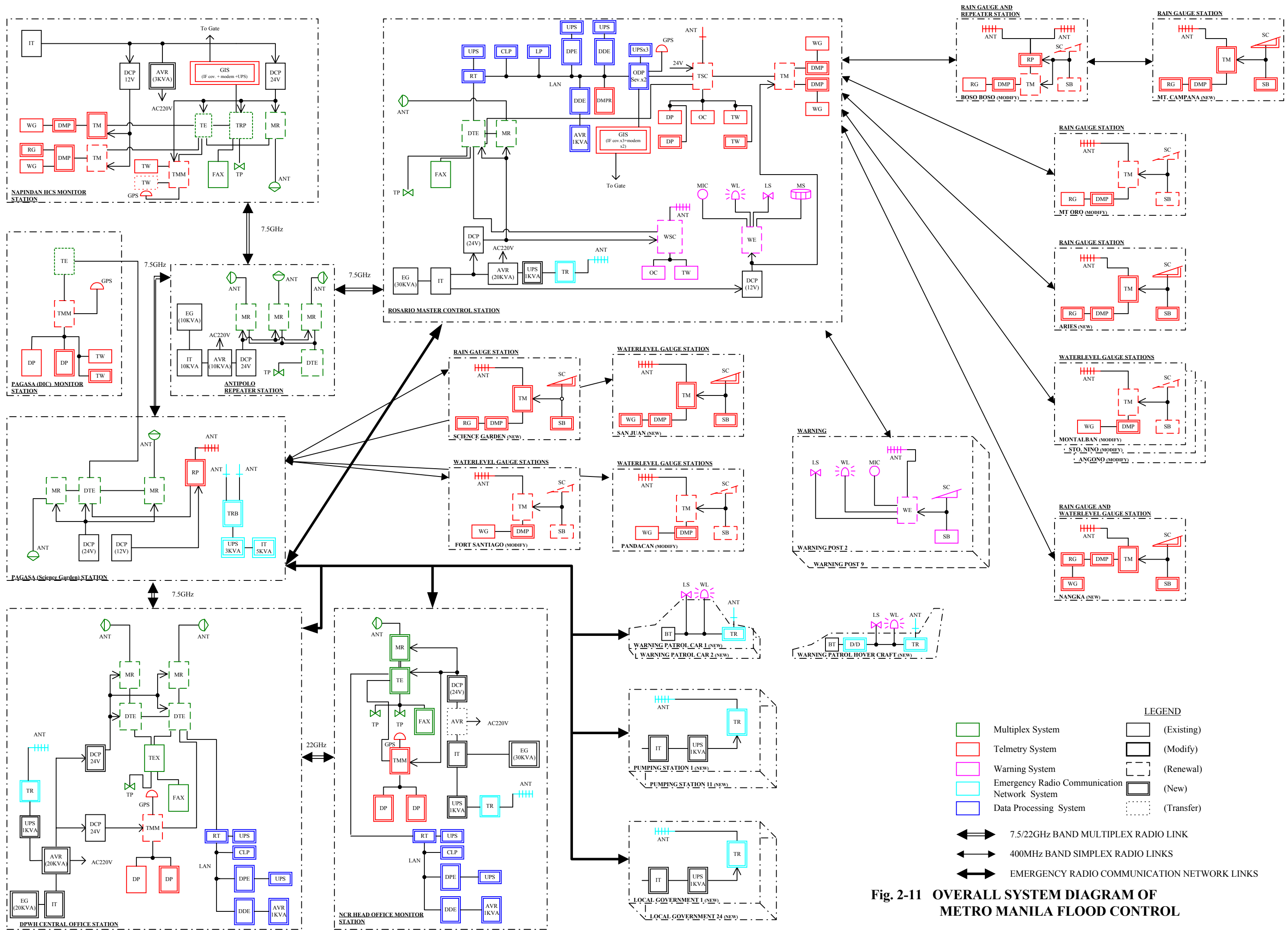
SYSTEM CONFIGURATION

PASIG MARIKINA AREA



- LEGEND:**
- Master Control Station
 - Monitor Station
 - Relay Station (Existing)
 - Rain Gauge Station (Existing)
 - Rain Gauge Station (Proposed)
 - Waterlevel Gauge Station (Existing)
 - Waterlevel Gauge Station (Proposed)
 - Warning Post (Existing)
 - Multiplex Radio Link (7.5 GHz, 22 GHz)
 - Simplex Radio Link (424.75 MHz for Telemetry, 424.90 MHz for Warning)

Fig. 2-10 TELEMETRY SYSTEM CONFIGURATION



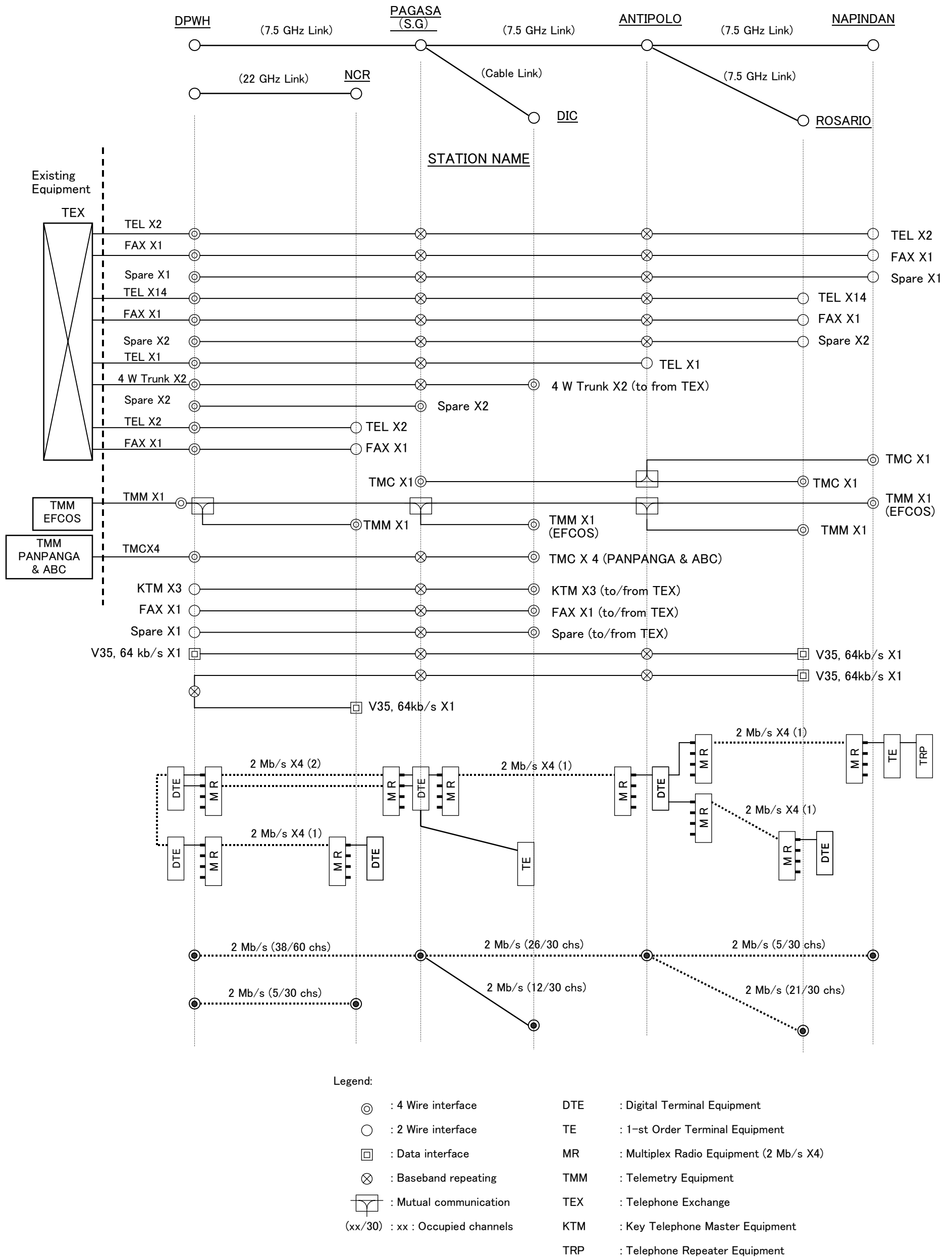


Fig.2-12 MULTIPLEX RADIO COMMUNICATION CHANNEL PLAN

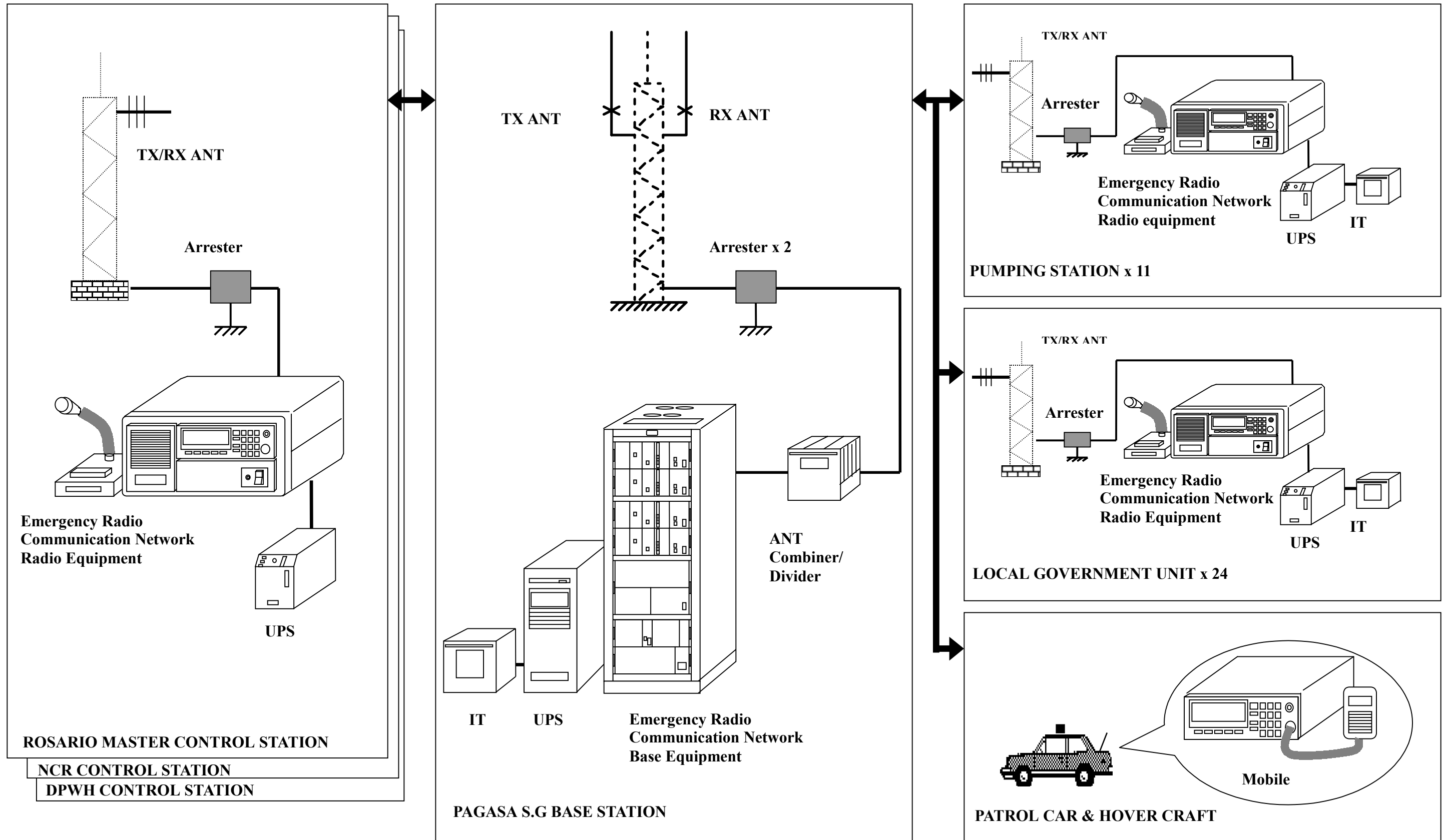


Fig.2-13 Emergency Radio Communication Network System Configuration Diagram

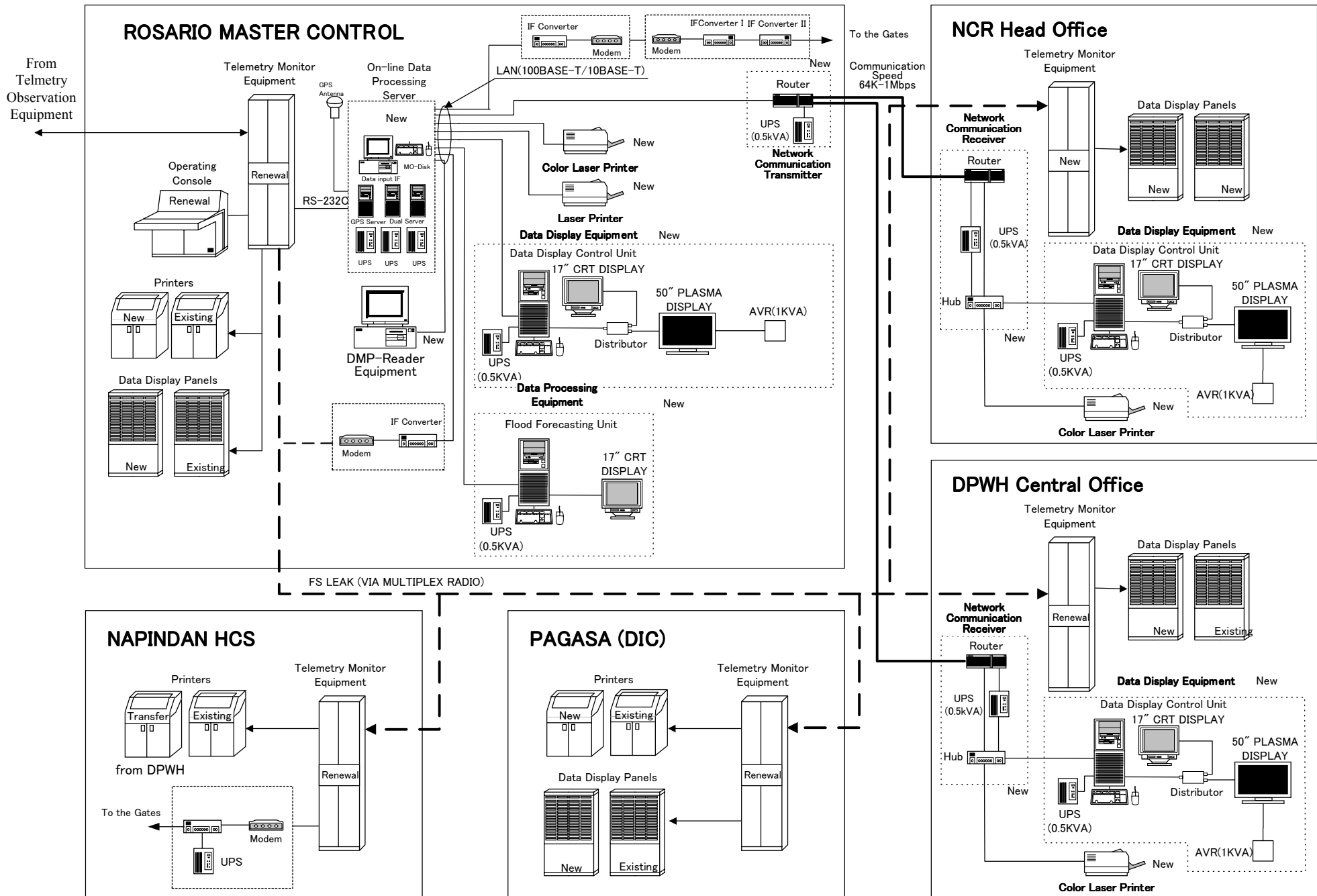
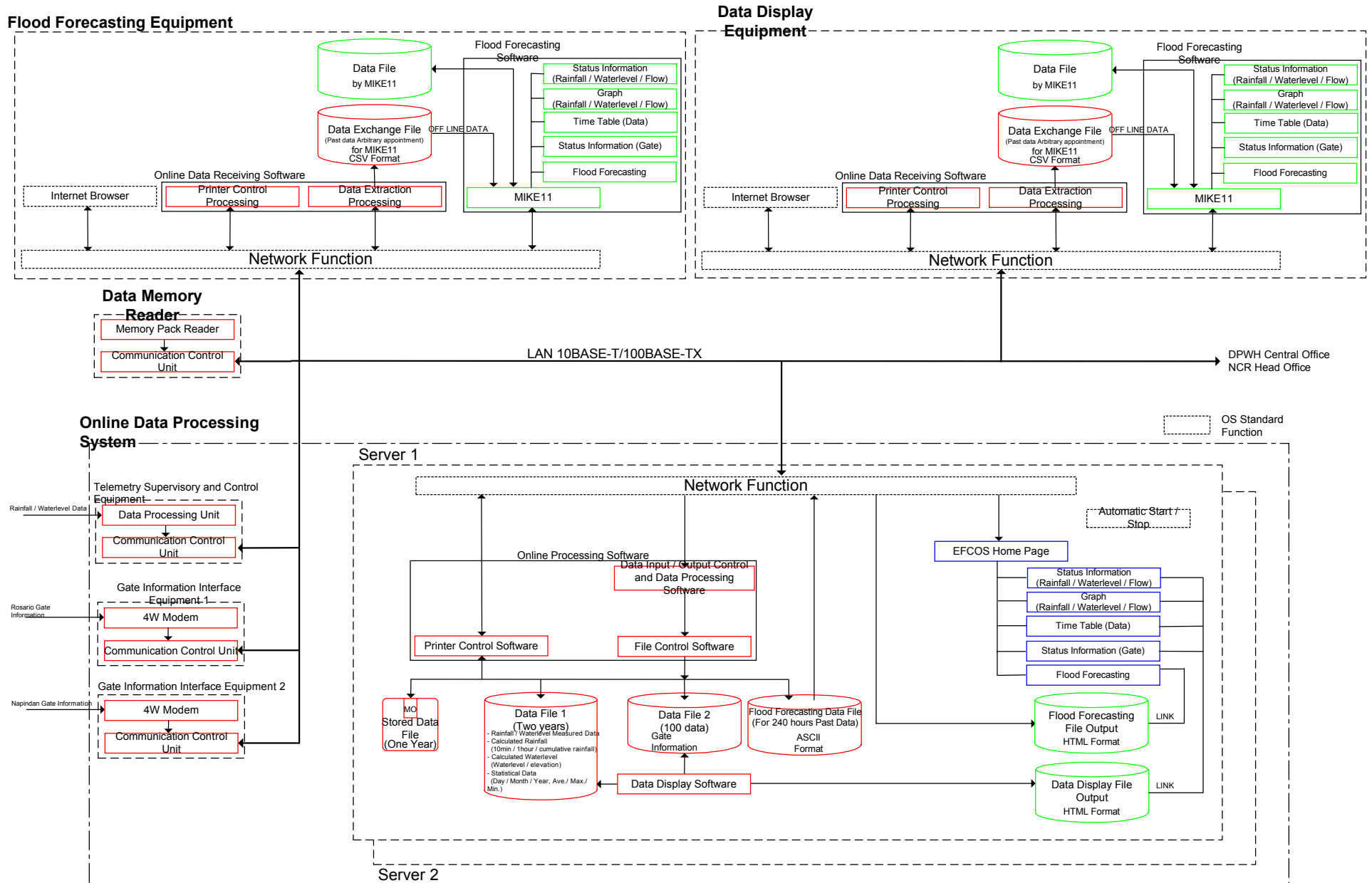
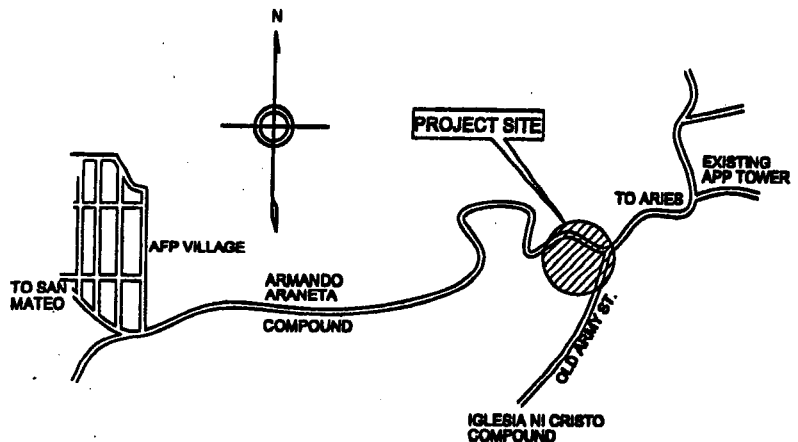


Fig. 2-14 HARDWARE SYSTEM CONFIGURATION

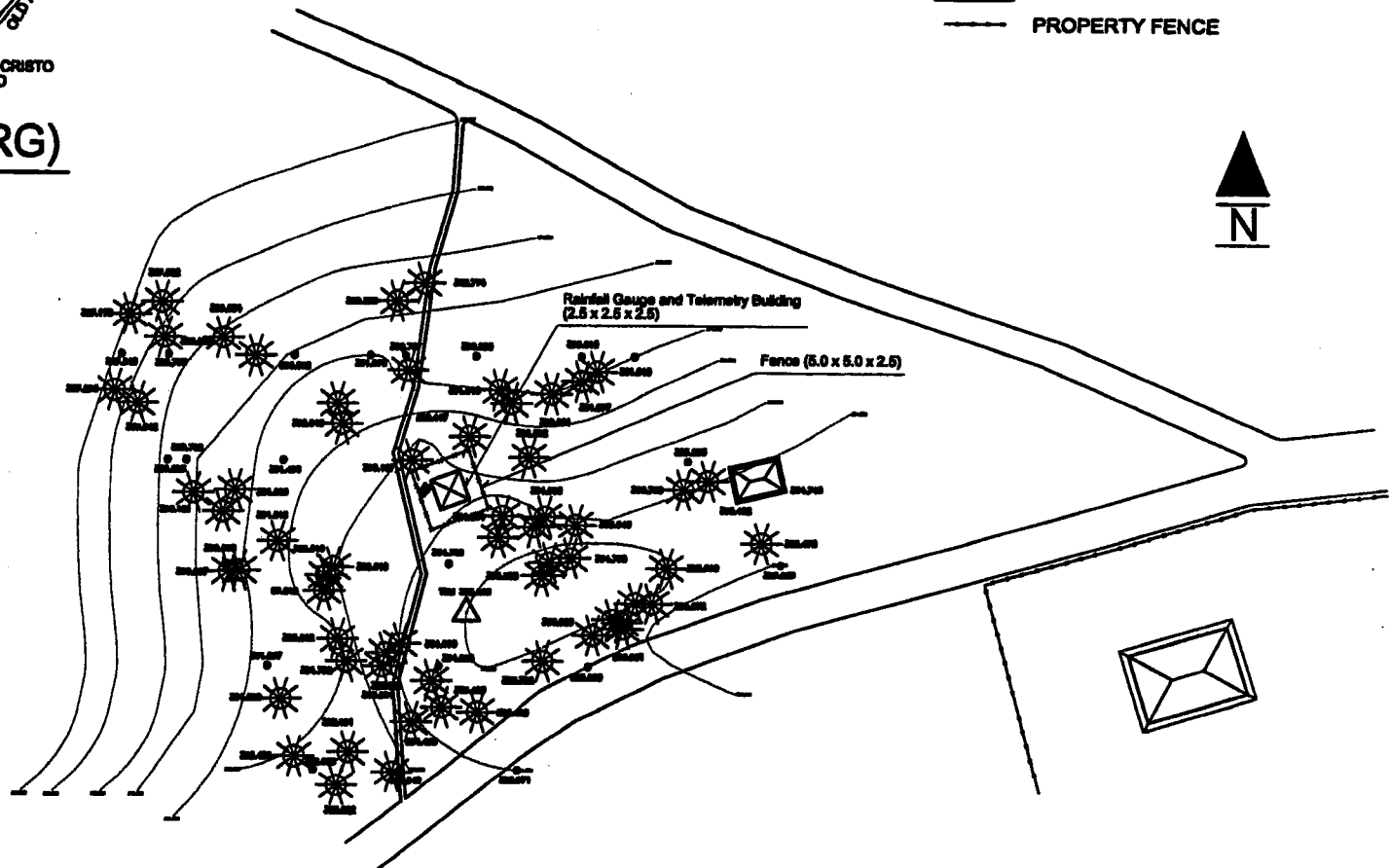
Fig. 2-15 CONFIGURATION OF DATA PROCESSING SYSTEM





VICINITY MAP (ARIES RG)
(NO SCALE)

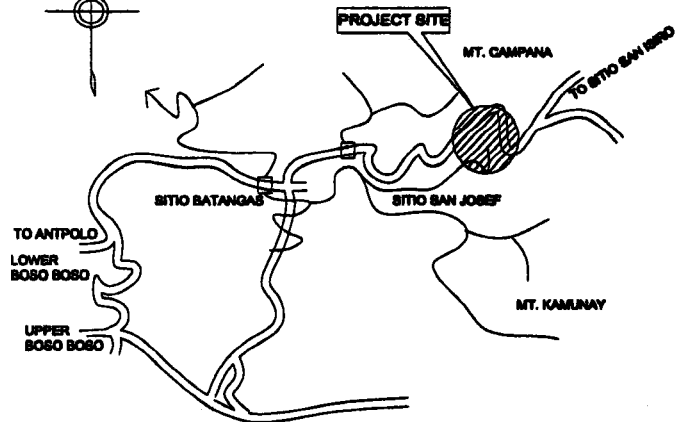
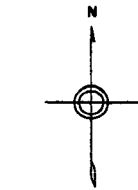
- LEGEND:**
- EXISTING TREE
 - CONTOUR LINE
 - EXISTING HOUSE
 - SPOT ELEVATION
 - TEMPORARY BENCH MARK
 - ROAD LAYOUT
 - PROPERTY FENCE



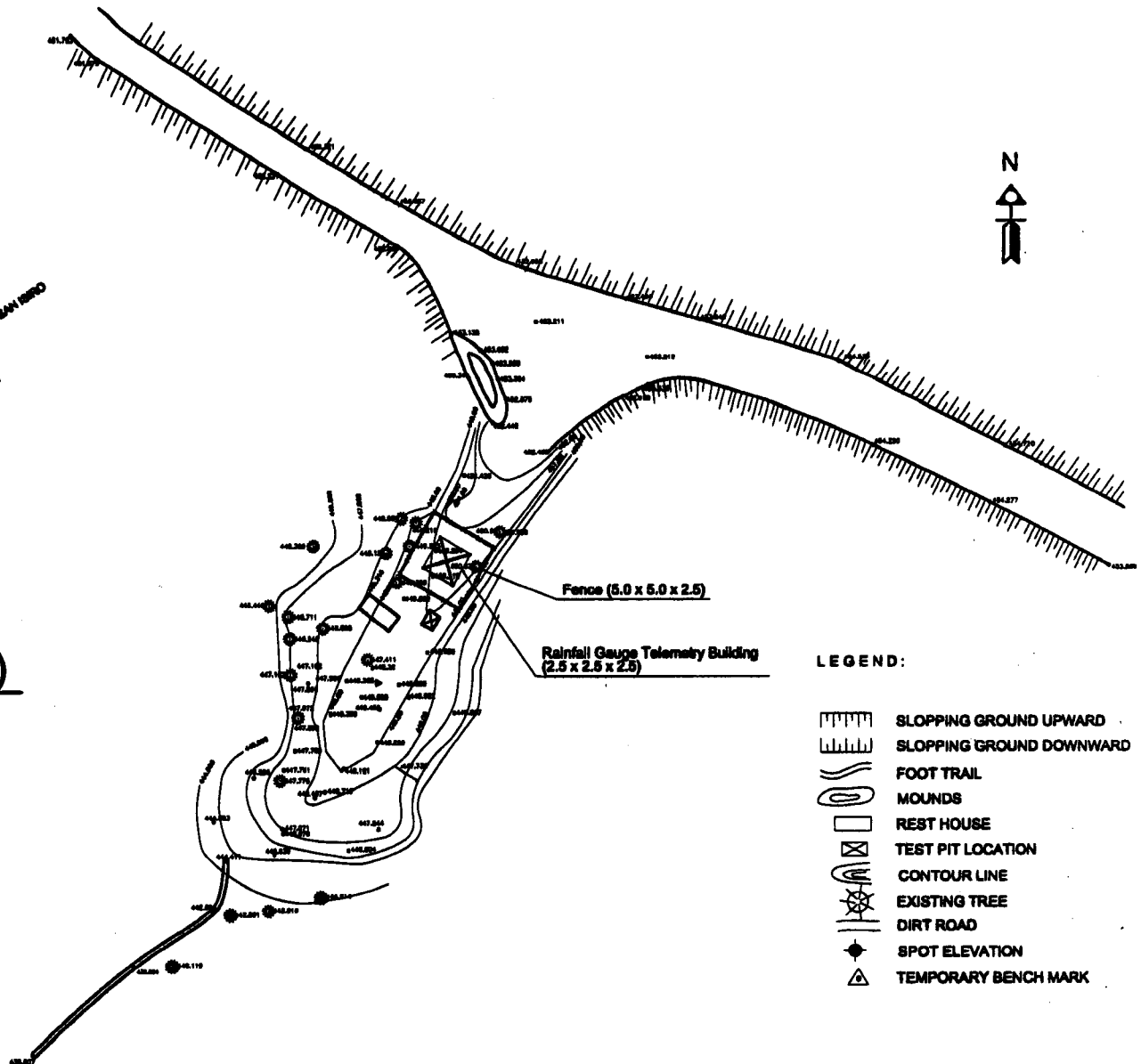
TOPOGRAPHY AT MT. ARIES
(NO SCALE)

Fig. 2-16 MT.ARIES RAINFALL STATION LOCATION PLAN

CONSULTANTS		PROJECT TITLE	DRAWING NO.
CTI ENGINEERING INTERNATIONAL CO., LTD IN ASSOCIATION WITH WOODFIELDS CONSULTANTS, INC.		SUBMITTED BY:	THE BASIC DESIGN STUDY ON THE PROJECT FOR REHABILITATION OF THE FLOOD CONTROL OPERATION AND WARNING SYSTEM IN METRO MANILA.
		DRAWN BY:	
		CHECKED BY:	
		DATE:	
		SUBMITTED BY: C.V. ABALOS, JR. DRAWN BY: C.V. ABALOS, JR. CHECKED BY: P.T. CENTENO	MT. ARIES PLAN 6-01



VICINITY MAP (MT. CAMPANA)
(NO SCALE)



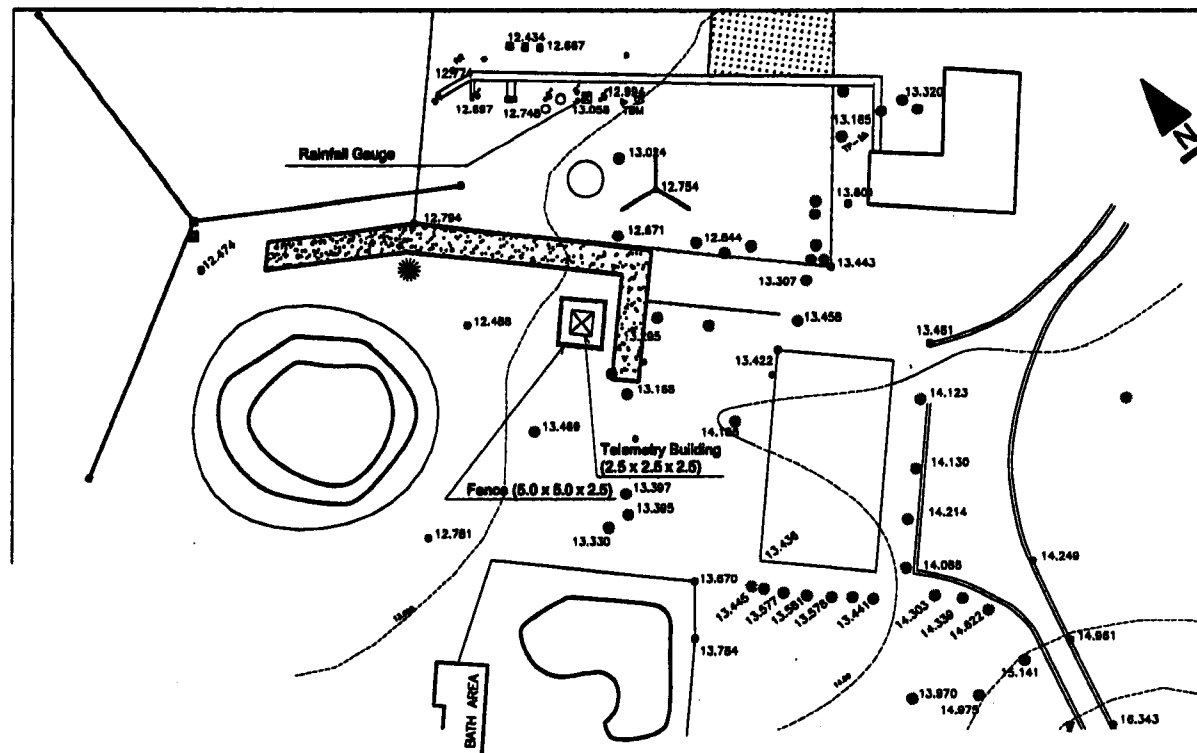
- LEGEND:**
- SLOPPING GROUND UPWARD
 - SLOPPING GROUND DOWNWARD
 - FOOT TRAIL
 - MOUNDS
 - REST HOUSE
 - TEST PIT LOCATION
 - CONTOUR LINE
 - EXISTING TREE
 - DIRT ROAD
 - SPOT ELEVATION
 - TEMPORARY BENCH MARK

TOPOGRAPHY OF MT. CAMPANA
(NO SCALE)

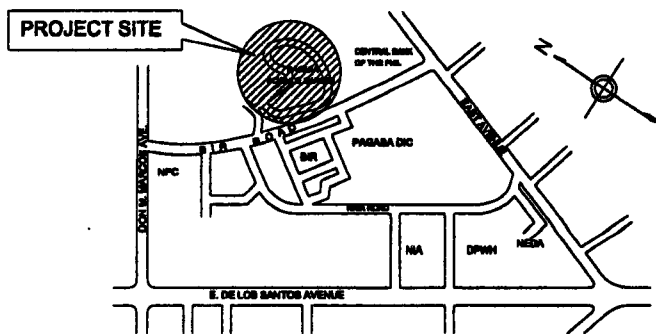
Fig. 2-17 MT.CAMPANA RAINFALL STATION LOCATION PLAN

CONSULTANTS		PROJECT TITLE	DRAWING NO.		
CTI ENGINEERING INTERNATIONAL CO., LTD IN ASSOCIATION WITH WOODFIELDS CONSULTANTS, INC.		THE BASIC DESIGN STUDY ON THE PROJECT FOR REHABILITATION OF THE FLOOD CONTROL OPERATION AND WARNING SYSTEM IN METRO MANILA.	MT. CAMPANA PLAN 4-01		
				SUBMITTED BY:	C.V. ABALOS, JR.
				SURVEYED BY:	C.V. ABALOS, JR.
				DRAWN BY:	P.T. CENTENO
		CHECKED BY:			

- LEGEND:
- EXISTING POND
 - Y ANTENNA WITH GUY WIRE
 - OFFICE BUILDING
 - BASKETBALL COURT
 - △TP TURNING POINT
 - △TBM BENCH MARK
 - X TOWER TRANSMISSION
 - || ROAD LAYOUT
 - SWIMMING POOL
 - LANDSCAPE STONE
 - EXISTING TREE
 - CYCLONE WIRE FENCE
 - ▨ GARDEN AREA
 - ▨ PATH WALK
 - 8" STD. RAIN GAUGE
 - RAIN RECORDER
 - RAIN GAUGE METER
 - EVAPORATION BASIN
 - WIND VANE
 - ELECTRIC POST
 - CONTROL PANEL
 - PROPERTY WALL
 - SPOT ELEVATION
 - TEST PIT LOCATION
 - EXISTING MOUND
 - ▨ EXISTING ASPHALT ROAD
 - EXISTING FOUNDATION



TOPOGRAPHY OF SCIENCE GARDEN
(NO SCALE)



VICINITY MAP (SCIENCE GARDEN RG)

(NO SCALE)

Fig. 2-18 SCIENCE GARDEN RAINFALL STATION
LOCATION PLAN

CONSULTANTS	SUBMITTED BY	PROJECT TITLE	DRAWING NO.
CTI ENGINEERING INTERNATIONAL CO., LTD IN ASSOCIATION WITH WOODFIELDS CONSULTANTS, INC.	C. V. ABALOS, JR.	THE BASIC DESIGN STUDY ON THE PROJECT FOR REHABILITATION OF THE FLOOD CONTROL OPERATION AND WARNING SYSTEM IN METRO MANILA.	SC. GARDEN PLAN 3 - 01
	SURVEYED BY: C. V. ABALOS, JR.		
	DRAWN BY: C. V. ABALOS, JR.		
	CHECKED BY:		

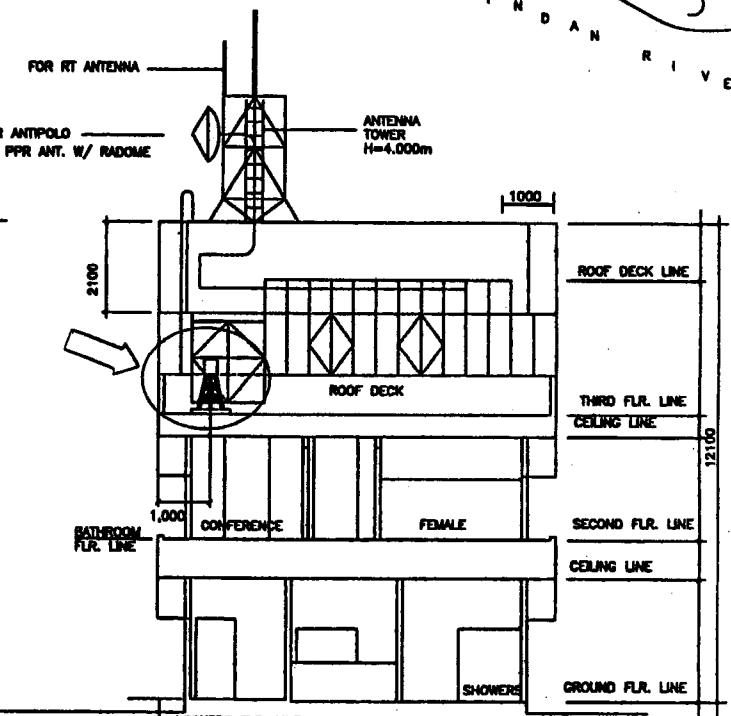
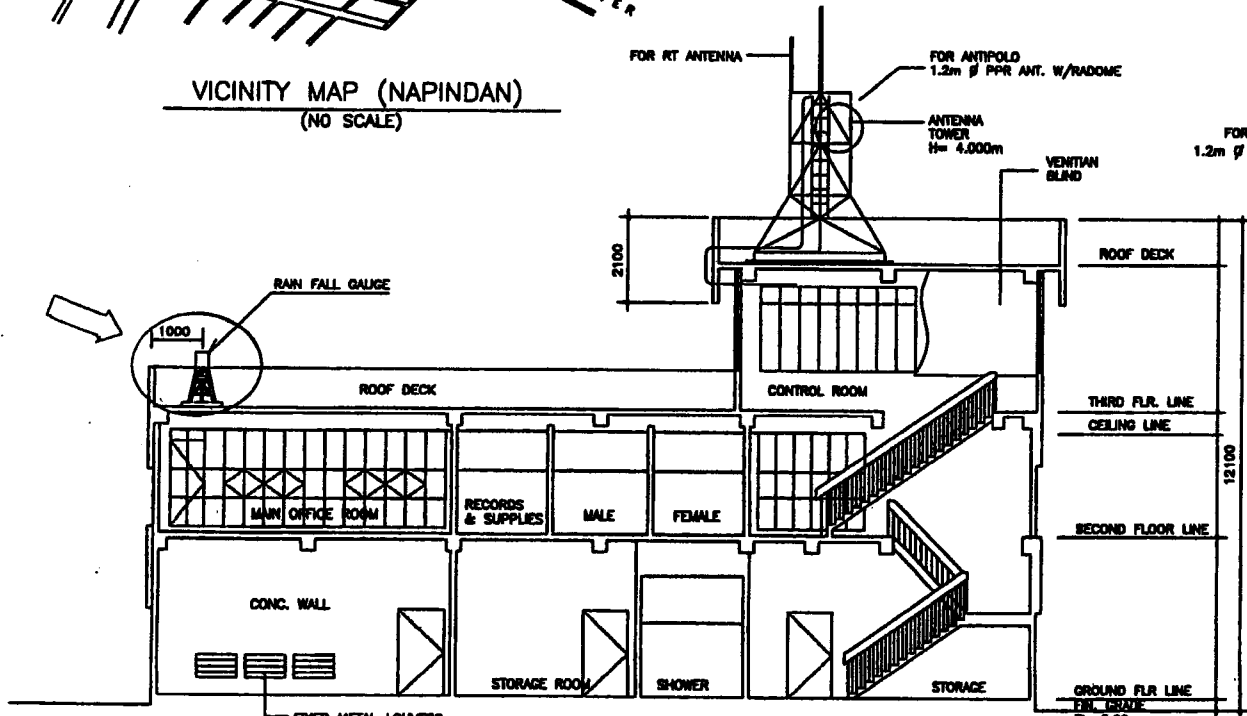
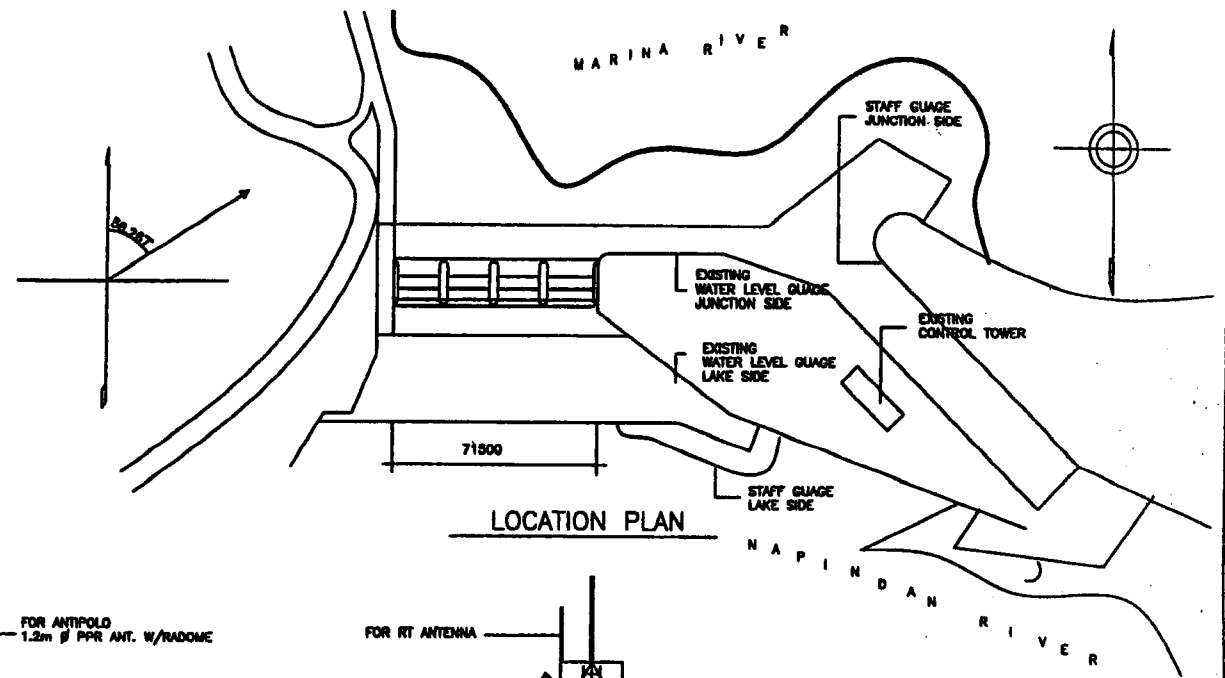
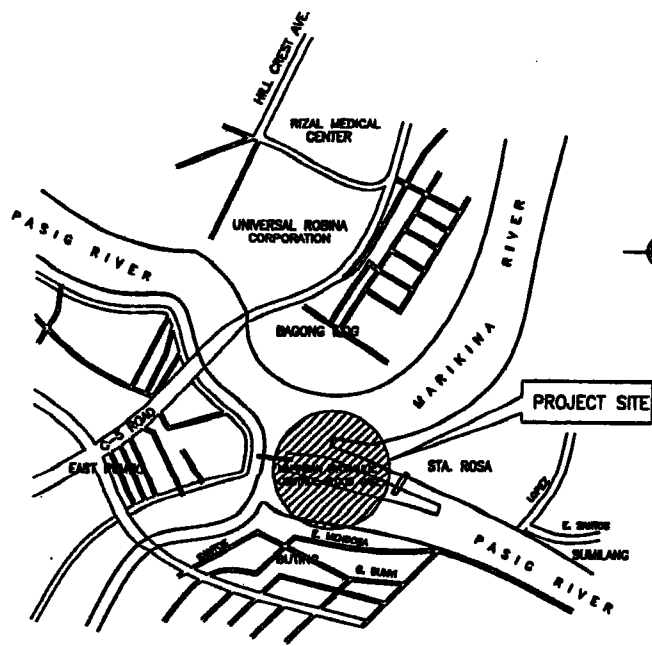


Fig. 2-19 NAPINDAN RAINFALL GAUGE LOCATION PLAN

CONSULTANTS		PROJECT TITLE		DRAWING NO.	
CTI ENGINEERING INTERNATIONAL CO., LTD IN ASSOCIATION WITH WOODFIELDS CONSULTANTS, INC.		SUBMITTED BY:	THE BASIC DESIGN STUDY ON THE PROJECT FOR REHABILITATION OF THE FLOOD CONTROL OPERATION AND WARNING SYSTEM IN METRO MANILA.		NAPINDAN PLAN 7-01
		SURVEYED BY:			
		DRAWN BY:			
		CHECKED BY:			