THE ISLAMIC REPUBLIC OF PAKISTAN

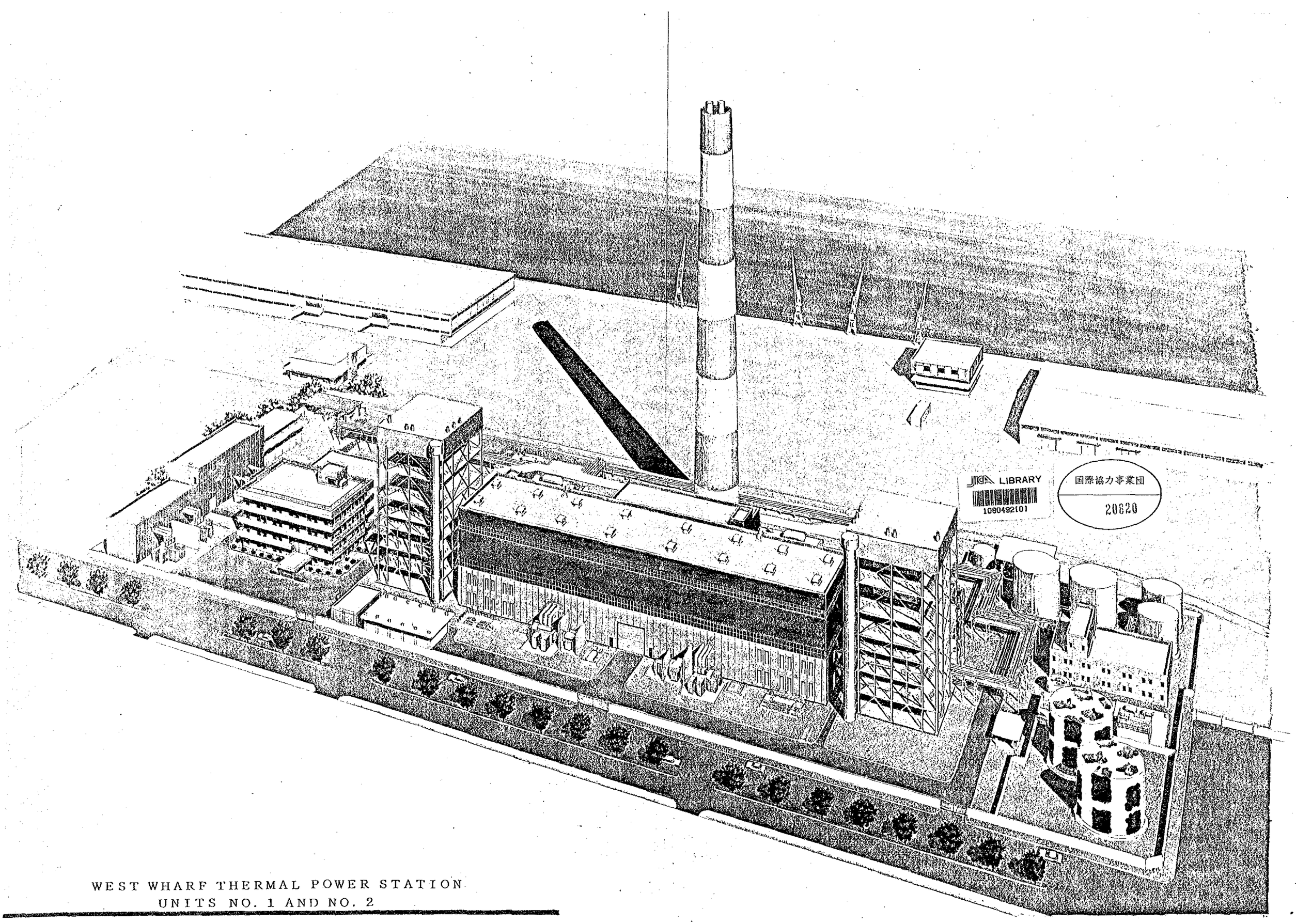
DETAILED DESIGN STUDY
ON
WEST WHARF
THERMAL POWER PLANT PROJECT

FINAL REPORT-II

LOT IIA (VOLUME 3)

JANUARY 1990

JAPAN INTERNATIONAL COOPERATION AGENCY



WEST WHARF THERMAL POWER STATION
UNITS NO. 1 AND NO. 2

CONTENTS

MESSRS: KARACHI ELECTRIC SUPPLY CORPORATION

PROJECT: WEST WHARF THERMAL POWER PLANT PROJECT

SCHEDULE OF IMPLEMENTATION (TENTATIVE)

No. WGT-1003
DATE 10TH JAN 1990
DIV.

COPY TO

PROGRES MONTHS: -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

MASTER SCHEDULE

UNIT 1: P/S, M/F, TSS, BSS, D/L, BHT, P/R, I/F, I/S, C/O

UNIT 2: DM/S, P/S, M/F, TSS, BSS, D/L, BHT, P/R, I/F, I/S, C/O

LOT I

POWER PLANT EQUIPMENT & CIVIL AND ARCHITECTURAL

UNIT 1: C/S; DESIGN & MANUFACTURING; BOILER SHIPPING; T/G ROOM SHIPPING; STEEL STRUCTURE; TSS; ELECTRICAL ERECTION; P/R; T/O; D/L CHIPPING; T/G ERECTION; I/S; UNIT 1 C/O; SHIPPING P/S; PILING; M/F FOUND. UNIT 1 MAIN POWERHOUSE; T/G PEDESTAL; PREPARETION; MAT FOUNDATION; BSS; BOILER STRUCTURE; BOILER ERECTION; BHT; BOILER ERECTION; AUX. FOUNDATION; AUX. ERECTION; DISCHARGE TUNNEL CONSTRUCTION; INTAKE CHANNEL, PUMP PIT CONSTRUCTION; CWP. SCREEN ETC. INSTALLATION; PLANT WATER FOUNDATION & ERECTION; OUTDOOR PIPE SUPPORT FOUND. & ERECTION; ST/PIPE INSTALLATION; SUPER STRUCTURE; PLANT WATER OUTDOOR PIPE INSTALLATION

UNIT 2: DM/S, P/S, M/F, TSS, D/L CHIPPING, T/G ERECTION, T/O, I/S, UNIT 2 C/O; "B" & "BX" DISMANTLING BELOW GROUND; UNIT 1 P/S; MAT FOUND., BOILER STRUCTURE, BSS, T/G PEDESTAL, BHT, BOILER ERECTION, BOILER ERECTION, BOILER SHIPPING; AUX. FOUNDATION; AUX. ERECTION; DISCHARGE TUNNEL CONSTRUCTION; INTAKE CHANNEL PUMP PIT CONSTRUCTION; CWP. SCREEN ETC. INSTALLATION; OUTDOOR PIPE SUPPORT FOUND. & ERECTION; ST/PIPE INSTALLATION

LOT II

DISMANTLING WORKS

C/S; "A" & FLATS; "B" & ABOVE GROUND; "BX" ABOVE GROUND; GP; ADMI. BUILDING CONSTRUCTION

LOT IIA

SUBSTATION & GRID STATION

C/S; DESIGN & MANUFACTURING; SHIPPING INSTALLATION; 220kv, 132kv; C/O; TEST; PILE SHIPPING; PILING; FOUND; FINISHING A/C; VENT PLUMBING; STEEL STRUCTURE SHIPPING; CABLE TUNNEL CONSTRUCTION; CABLING; PREPARETION; DISMANTLING "B" DISCHARGE WAY INCLUDING TEMPO. WORK

LOT IIB

220/132kv TRANSMISSION LINE

C/S; DESIGN & MANUFACTURING; SHIPPING; TOWER ERECTION; C/O; TEST; TOWER FOUNDATION WORKS; STRINGING

OWNER'S WORKS

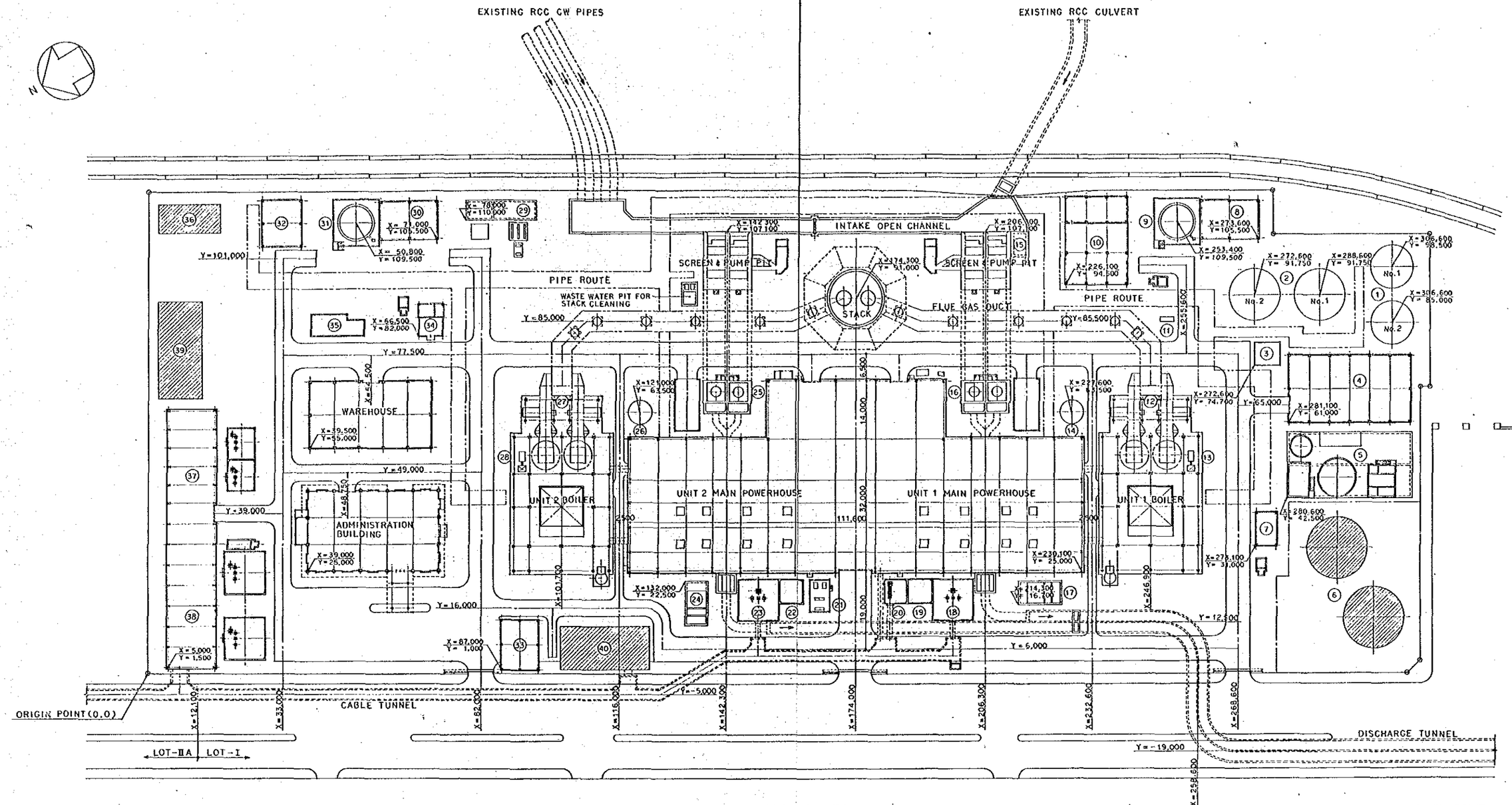
SHIFTING WORKS OF 66KV OUTDOOR SWITCHYARD (9 MONTHS)

SHUT-DOWN OF "BX"

C/S : CONTRACT SIGNING
P/S : PILING START
M/F : MAT FOUNDATION START
TSS : TURBINE STEEL STRUCTURE START
BSS : BOILER STEEL STRUCTURE START
D/L : DRUN LIFTING
BHT : BOILER HYDROSTATIC TEST
P/R : POWER RECEIVING
I/F : INITIAL FIRING
I/S : INITIAL STEAMING
C/O : COMMERCIAL OPERATION
T/O : TEST & TRIAL OPERATION
DM/S : DISMANTLING WORK START
AUX. : AUXILIARY EQUIPMENT
GP : GUARANTEE PERIOD
▭ : INTERNATIONAL TENDER
▭ : OWNER'S WORK
◉ : EVENT
◎ : KEY DATE OF THE CONTRACT

REMARKS

REV. No.	APPROVED BY	CHECKED BY	DRAWN BY
REV. DATE			
CONTENTS	Akio Otsuka	S. Fujimaki	

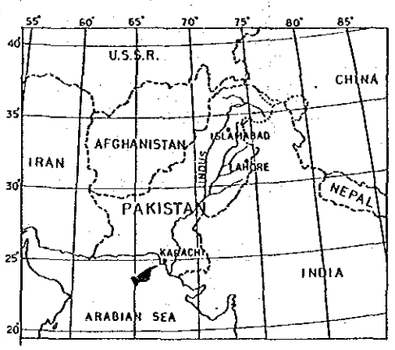


SITE LAYOUT PLAN

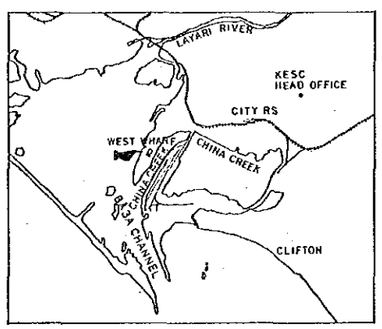
SCALE 1 : 500

No.	DESCRIPTION
1	Deminoralized Water Tank
2	Raw WaterTank
3	Chemical Storage Tank
4	Water Treatment Equip. & Control Room
5	Waste Water Treatment Area
6	Fuel Oil Storage Tank(Existing)
7	Fuel Oil Transfer Pump
8	Unit 1 Fuel oil Pump & Heater Area
9	Unit 1 Fuel oil Service Tank
10	Chlorination Equip. Area & Control Room
11	Air Foam Equipment Area
12	Unit 1 Forced Draft Fan
13	Unit 1 Gas Recirculating Fan
14	Unit 1 Make-up Water Tank
15	Chlorination Feed Water Pump Pit
16	Unit 1 Circulating Water Pump
17	Unit 1 Unit Neutralizing Pit
18	Unit 1 Main Transformer
19	Unit 1 Auxiliary Transformer
20	Starting Transformer

No.	DESCRIPTION
21	Turbine Oil Storage Tank
22	Unit 2 Auxiliary Transformer
23	Unit 2 Main Transformer
24	Unit 2 Unit Neutralizing Pit
25	Unit 2 Circulating Water Pump
26	Unit 2 Make-up Water Tank
27	Unit 2 Forced Draft Fan
28	Unit 2 Gas Recirculating Fan
29	Raw Water Pretreatment Area
30	Unit 2 Fuel oil Pump & Heater Area
31	Unit 2 Fuel oil Service Tank
32	House Boiler Area
33	Guard House
34	H_2 Gas Generating Room
35	Storage Box for Stop Log
36	Existing Gas Station(Sui Gas)
37	132kV Substation
38	220kV Substation
39	66kV Switchyard Indoor(Existing)
40	11kV Grid Station(Existing)



PAKISTAN MAP



LOCATION MAP

ORIGIN POINT +Y -X +X -Y

GRAPHIC SCALE

0 5 10 20 30m

SCALE 1 : 500

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

SITE LAYOUT PLAN

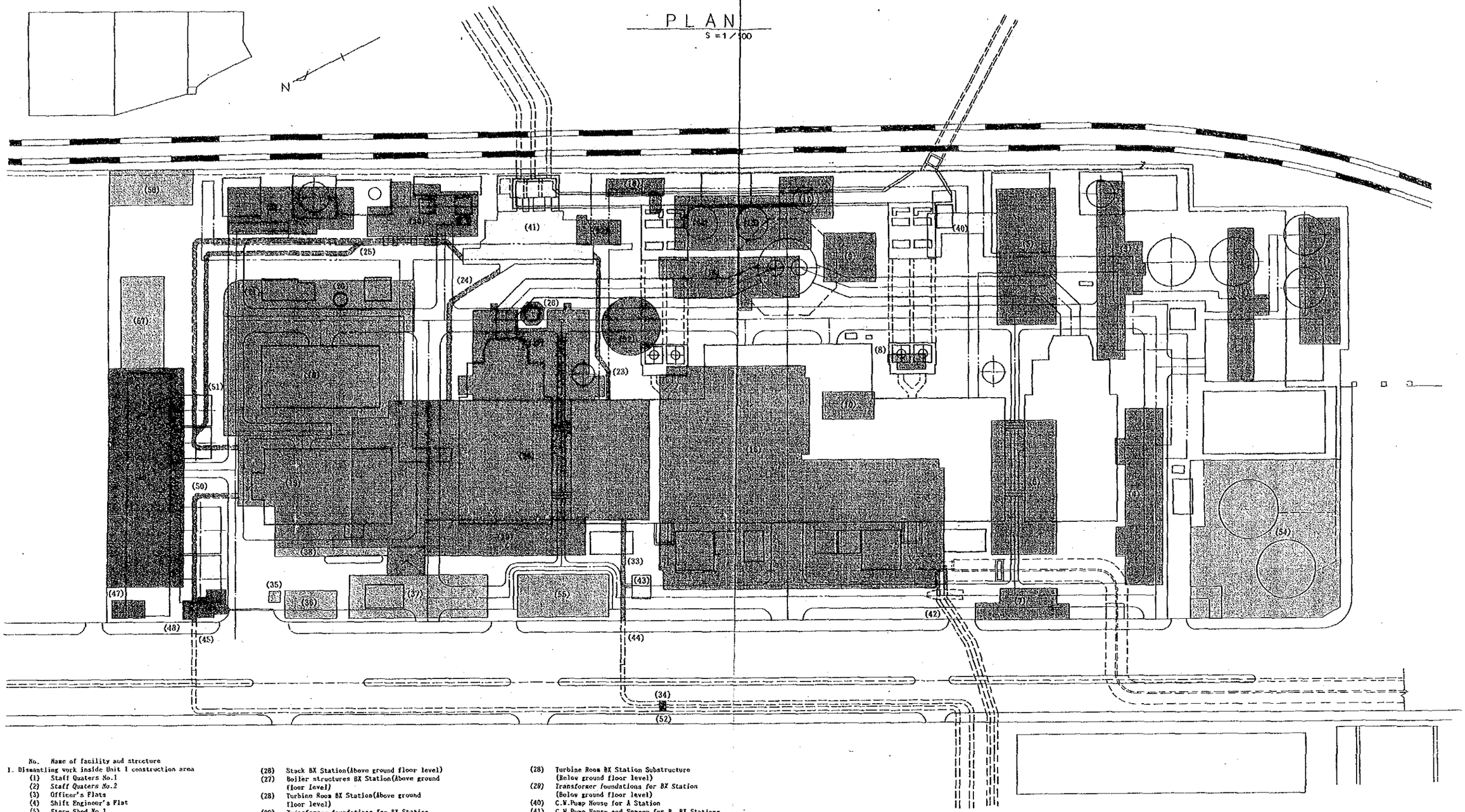
JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
DRAWING NO.	SCALE	DATE	
WAT – 1001	1 : 500	10 JAN. 1990	

PLAN

S = 1 / 100



No.	Name of facility and structure
1. Dismantling work inside Unit 1 construction area	
(1)	Staff Quaters No.1
(2)	*Staff Quaters No.2*
(3)	Officer's Flats
(4)	Shift Engineer's Flat
(5)	Store Shed No.1
(6)	Store Shed No.2
(7)	Canteen
(8)	Underground Tank
(9)	Ground Reservoir
(10)	Wall
(11)	Oil Tank No.1
(12)	Oil Tank No.2
(13)	Oil Tank No.3
(14)	Instrument and Control Room
(15)	A Station (Boiler and Turbine Room)
(16)	Sanitary Block and Sewage Pump room
(17)	*Also, roads, trees, drainage facilities,* cables and etc. inside of Unit 1 area
2. Dismantling work inside of Unit 2 construction area	
Category B Station	
(18)	Boiler Room B Station Superstructure(Above ground floor level)
(19)	Turbine Room B Station including Transformer Bay(Above ground floor level)
(20)	Stack B Station(Above ground floor level)
(21)	Misc. Foundations and Wall(Above ground floor level)
Category BX Station	
(22)	Switch Room
(23)	Intake Water Pipe for BX Station No.1
(24)	Intake Water Pipe for BX Station No.2
(25)	Intake Water Pipe for B Station
(26)	Stack BX Station(Above ground floor level)
(27)	Boiler structures BX Station(Above ground floor level)
(28)	Turbine Room BX Station(Above ground floor level)
(29)	Transformer foundations for BX Station (Above ground floor level)
(30)	Electric Shop, Raw Water Service Pump etc.
(31)	Machine Shop and Store
(32)	C.W.Tank
(33)	Discharge Water Pipe for BX Station
(34)	Closing work of C.W.Discharge Line for BX Station at Terminal Chamber
Category Administration Building	
(35)	Guard house
(36)	Car Parking
(37)	Administration Building
(38)	Cable Trench
(39)	Also, roads,trees, drainage facilities, cables and etc. inside of Unit 2 area
3. Dismantling works to be carried out by Lot-I Contractor	
(18)	Boiler Room B Station Substructure(Below ground floor level)
(19)	*Turbine Room B Station Substucture including Transformer Bay(Below ground floor level)*
(20)	Stack B Station Substructure(Below ground floor level)
(21)	Misc. Foundations and *Wall(Below ground floor* level)
(26)	Stack BX Station Substructure(Below ground floor level)
(27)	Boiler structures BX Station Substructure (Below ground floor level)
(28)	Turbine Room BX Station Substructure (Below ground floor level)
(29)	*Transformer foundations for BX Station* (Below ground floor level)
(40)	C.W.Pump House for A Station
(41)	C.W.Pump House and Screen for B, BX Stations
(42)	Discharge Sump for A Station
(43)	Sewer Sump and Pumping Station
(44)	C.W.Discharge Pipe for BX Station (partial)
(45)	C.W.Discharge Pipe for B Station (partial)
4. Dismantling works to be carried out by Lot-II A Contractor	
(46)	66kV Switchyard (outdoor)
(47)	Pressure Tank
(48)	City Water receiving Pit
(49)	Dispensary
(50)	Discharge Water Pipe for B Station (partial)
(51)	*Intake Water Pipe for B Station (partial)*
(52)	Closing work of C.W.Discharge Line for B Station at Terminal Chamber
(53)	Also, roads,trees, drainage facilities, cables and etc. inside of Substation area and Transformer yard area
5. Structures not to be dismantled at this Project	
(54)	Fuel Oil Storage Tanks
(55)	11kV Switchgear Building
(56)	Sui Gas Cospound
(57)	66kV Switch Station Building

LEGEND :

Color	Structure No.	Area of Dismantle	Contractors
	(1) ~ (17)	Category"A" & Flats	Lot-III
	(18) ~ (21)	Category"B"	Lot-III
	(18) ~ (21)	Category"B" Substructure	Lot- I
	(22) ~ (34)	Category"BX"	Lot-III
	(26) ~ (29)	Category"BX" Substructure	Lot- I
	(35) ~ (39)	Category Admi.	Lot-III
	(40) ~ (45)		Lot- I
	(46) ~ (53)	Category Substation	Lot-II A
	(54) ~ (57)	Not to be dismantled	

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

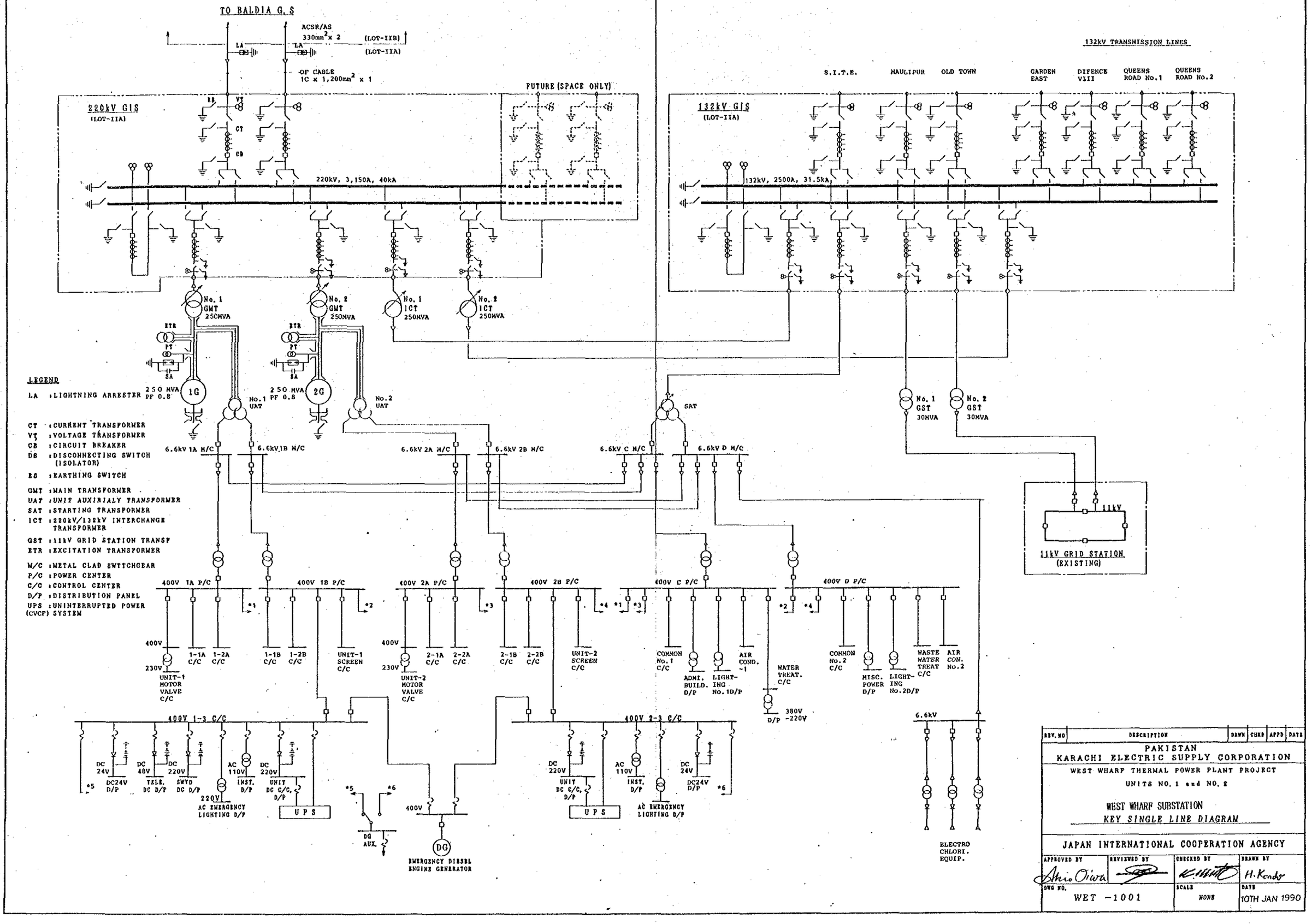
UNITS NO.1 AND NO.2

INTERFACE BETWEEN EXISTING AND PLANNED SITE LAYOUT

JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
	-		
DRAWING NO.		SCALE	DATE
WAT - 1002		1 / 500	10TH JAN 1990



REV. NO	DESCRIPTION	DRWN	CHKD	APPD	DATE

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 and NO. 2

WEST WHARF SUBSTATION
KEY SINGLE LINE DIAGRAM

JAPAN INTERNATIONAL COOPERATION AGENCY

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa		K. Mitsuhashi	H. Kondo
DWG NO. WET -1001		SCALE NONE	DATE 10TH JAN 1990

BALDIA No. 1

BALDIA No. 2

FUTURE

SYNCHRONIZE PANEL (220kV)

220kV 50Hz 3150A 40kA BUSBAR

A BUS

B BUS

LOT 1

No. 1 GENERATOR

GEN. CT

No. 2 GENERATOR

S. I. T. E.

SYNCHRONIZE PANEL (132kV)

132kV 50Hz 2500A
31.5kA BUSBAR

MAULIPUR

OLD TOWN

QUEENS ROAD No. 1

QUEENS ROAD No. 2

DEFFENCE VH

11kV GRID STATION

EXISTING

PAKISTAN

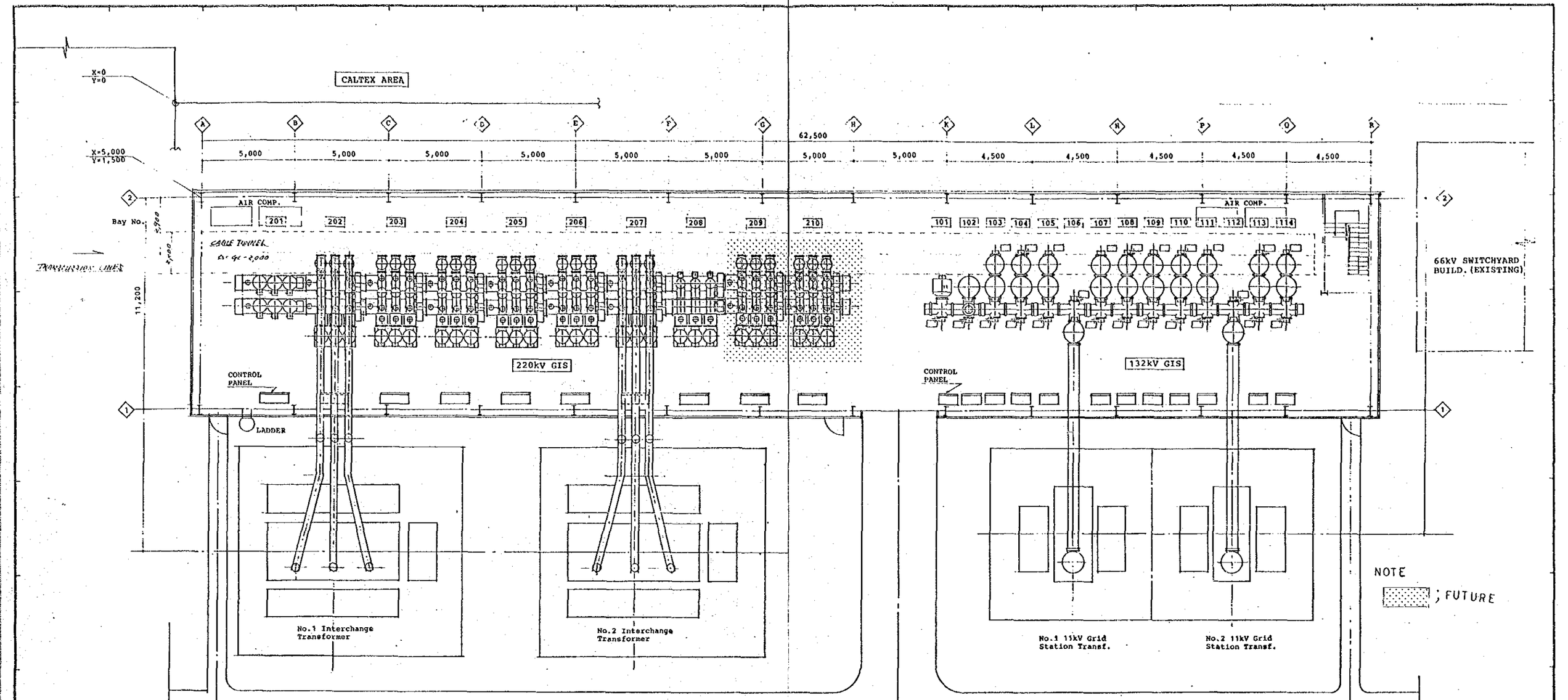
KARACHI ELECTRIC SUPPLY CORPORATION

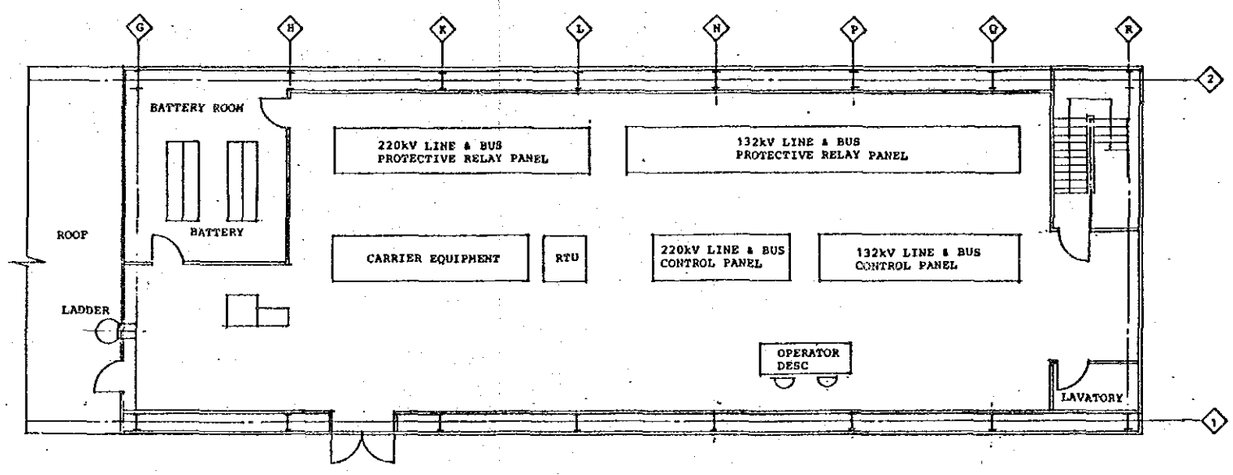
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO. 1 AND NO. 2

WEST WHARF SUBSTATION PROTECTION AND METERING SINGLE LINE DIAGRAM

JAPAN INTERNATIONAL COOPERATION AGENCY
TOKYO JAPAN

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa			H. Kondo
DRAWING NO.		SCALE	DATE
WET-1002		NONE	10TH JAN 1980





SUBSTATION CONTROL ROOM

SWITCHYARD BAY NUMBERS

Bay No.	220 kV	Bay No.	132 kV	Bay No.	132 kV
201	Bus PT	101	Bus PT	111	No.2 Interchange Transformer
202	No.1 Interchange Transformer	102	Bus Tie	112	No.2 11kV Grid Station Transf.
203	T/L BALDIA No.1	103	No.1 Interchange Transformer	113	T/L Garden East
204	T/L BALDIA No.2	104	Starting Transformer	114	T/L Difence VIII
205	No.1 Generator Transformer	105	T/L S.I.T.E.		
206	No.2 Generator Transformer	106	No.1 11kV Grid Station Transf.		
207	No.2 Interchange Transformer	107	T/L Mauripur		
208	Bus Tie	108	T/L Old Town		
209	T/L (Future)	109	T/L Queens Road No.1		
210	T/L (Future)	110	T/L Queens Road No.2		

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

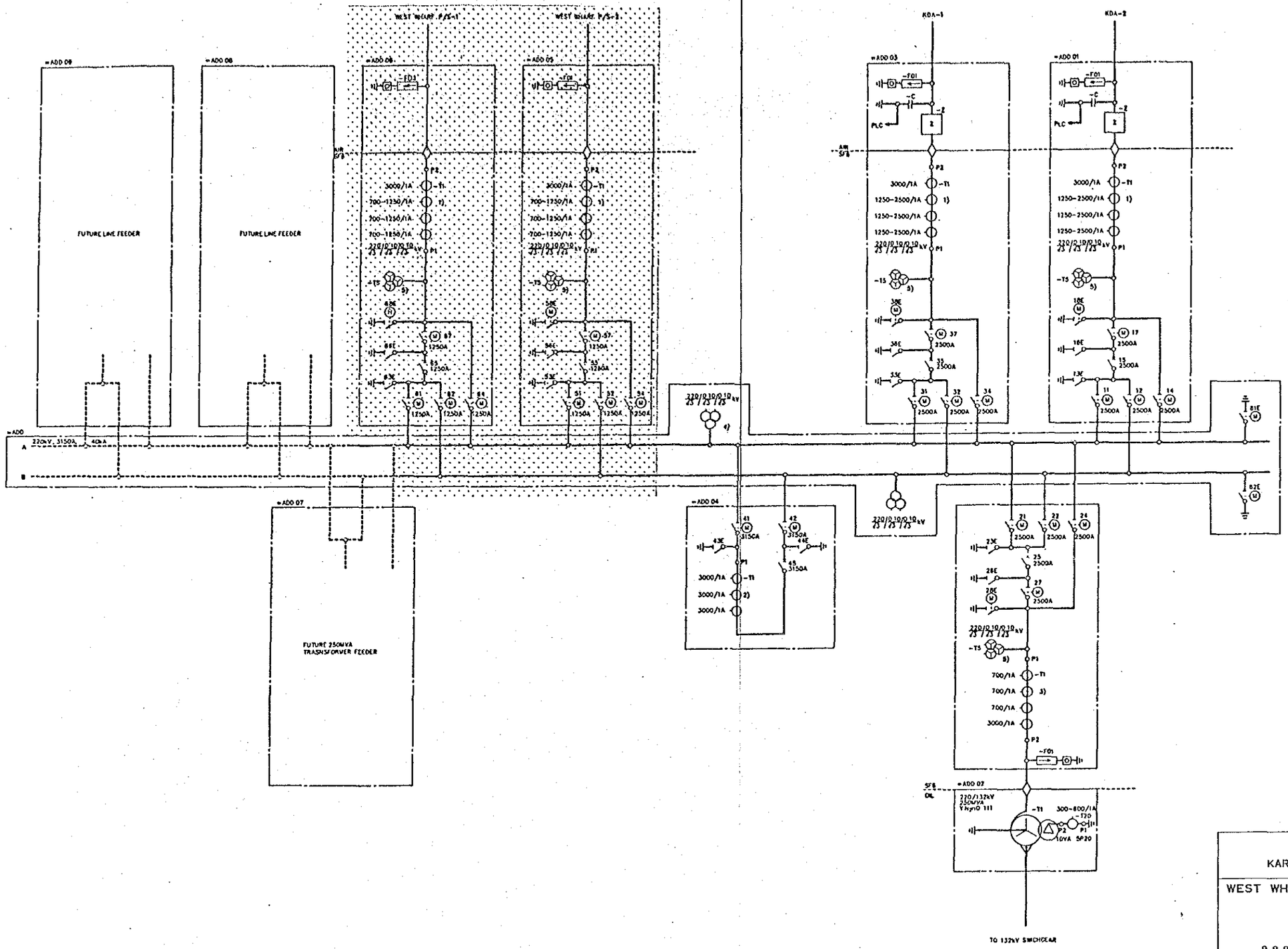
WEST WHARF SUBSTATION

ARRANGEMENT OF SUBSTATION

JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa		K. Matsuda	H. Kondo
DRAWING NO. WET – 1.003		SCALE NONE	DATE 10TH JAN 1990



1) CORE 1 20VA CL 0.2
2,3 40VA SP30
4 CLX Eknee>500V

2) CORE 1 20VA CL 0.2
2 20VA SP30
3,4 CLX Eknee>500V

3) CORE 1 20VA CL 0.2
2,3 20VA SP30
4 CLX Eknee>500V

4) CORE 1 75VA CL 0.2
2 75VA CL0.5

---------- FUTURE EXTENSION

SCOPE OF THE PROJECT

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

BALDIA GRID STATION
220kV SINGLE LINE DIAGRAM

JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa			H. Kondo
DRAWING NO.		SCALE	DATE
WET-1101		NONE	10TH JAN 1990

SEE DWN. NO. WET-1103 A

WEST WHARF P/S-1

WEST WHARF P/S-2

KDA ADN01

KDA ADN02

10700 10700 10700 10700

6400 6400 6400 6400 6400 6400 6400 6400 6400 6400 6400

3000 3000 4700 3000 3000 4700 3000 3000 2250

R S T

BUS-TIE

R S T

Future 220kV GIS Building

A

A5 A6 A5 A6 D4 B A D3 D2 P.O ANC 01 AND 11 D1 P.O ANC 04

1800 1400 1400 1800

Building Extension Existing Building

Control building

2000 2000 6000 10000 4000 6000 12000 6000

2000 7100 7100 5100

6500 900

R S

11800

Transf. ATO 01
250MVA 22/132kV

2940

SCOPE OF THE PROJECT

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

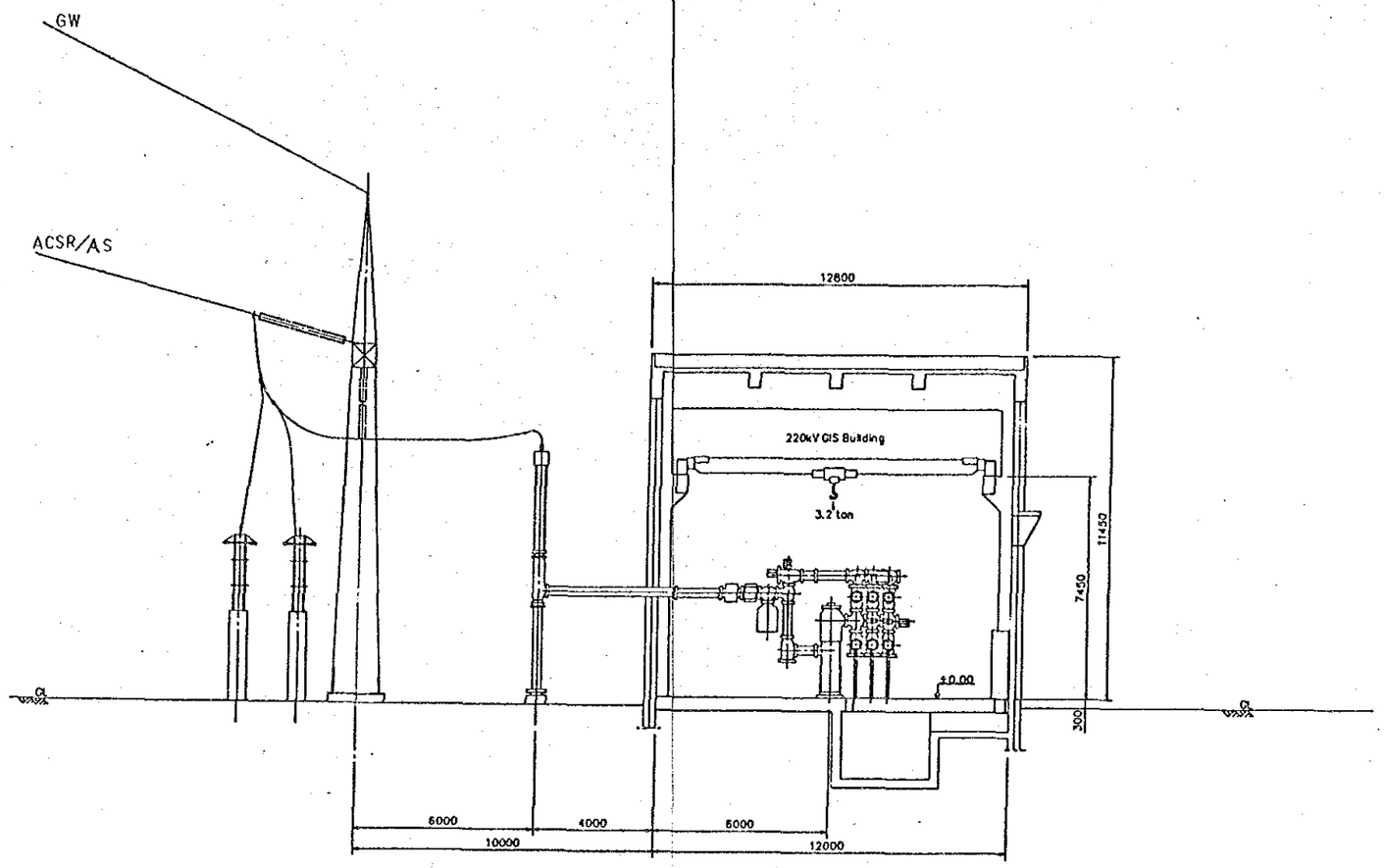
UNITS NO.1 AND NO.2

BALDIA GRID STATION
220kV GIS BUILDING
LAYOUT (PLAN)

JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa			H. Kondo
DRAWING NO.		SCALE	DATE
WET-1102		NONE	10TH JAN 1990



Section A – A

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

BALDIA GRID STATION
220kV GIS BUILDING
LAYOUT (SECTION)

JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akira Oiwa			H. Kondo
DRAWING NO.	SCALE	DATE	
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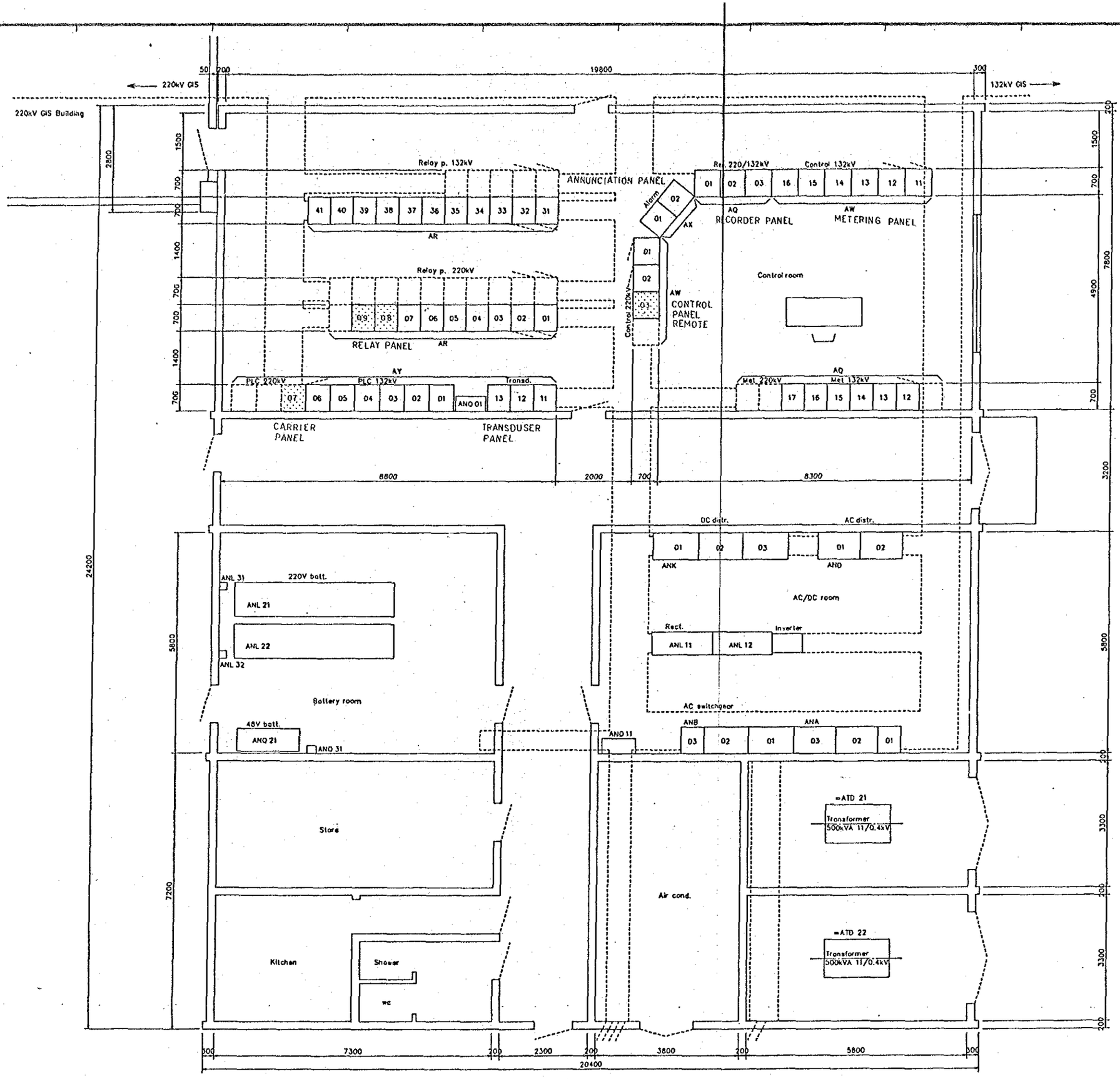


NOTE

; NEW ESTABLISHMENT PANELS FOR THE PROJECT

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

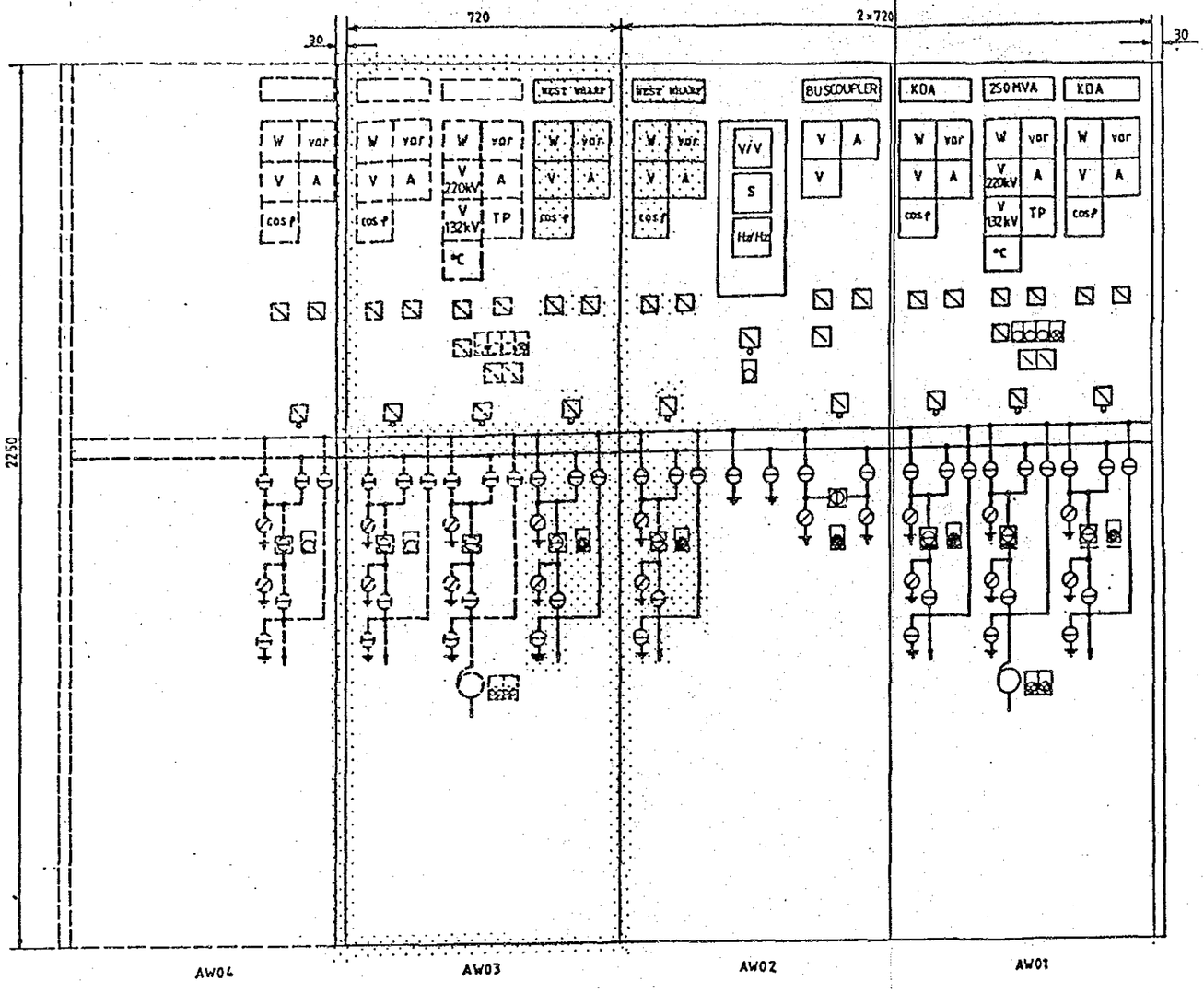
UNITS NO.1 AND NO.2

BALDIA GRID STATION CONTROL BUILDING

JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa			H. Kondo
DRAWING NO	SCALE	DATE	
WET-1104	NONE	10TH JAN 1990	



: SCOPE OF THE PROJECT

: FUTURE EXTENSION

: EXISTING

A INSTRUMENT

SELECTOR SWITCH

LOCKABLE SEL. SWITCH

PUSH BUTTON

ILUMINATED PUSH BUTTON

INDICATION LAMP

POSITION INDICATOR

DISCREPANCY SWITCH

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

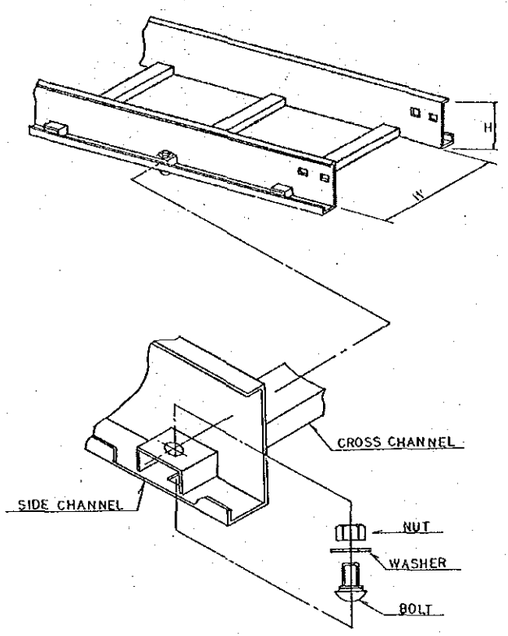
BALDIA GRID STATION CONTROL PANEL 220kV FRONT VIEW

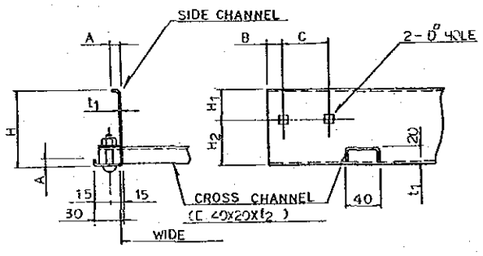
JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

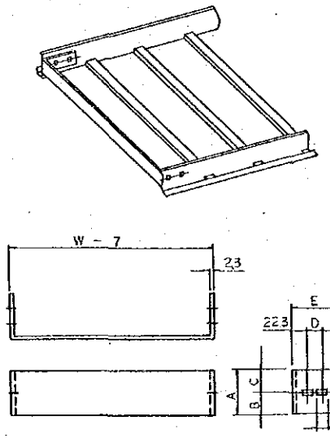
APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa			H. Kondo
DRAWING NO.		SCALE	DATE
WET-1105		NONE	10TH JAN 1990

LADDER TYPE CABLE TRAY

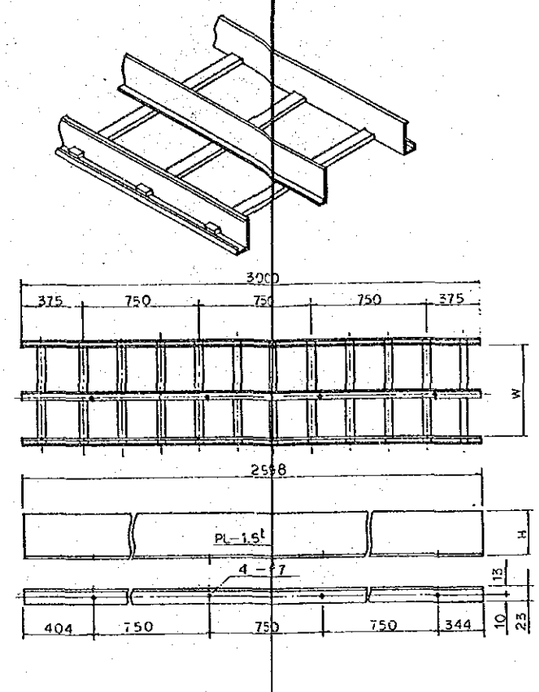




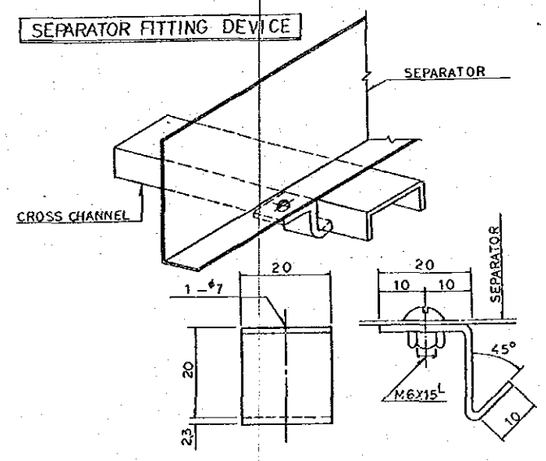
END PLATE



SEPARATOR

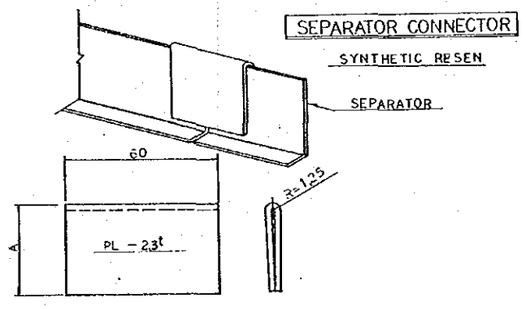


SEPARATOR FITTING DEVICE

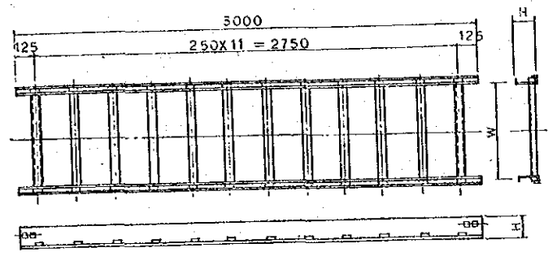


SEPARATOR CONNECTOR

SYNTHETIC RESEN

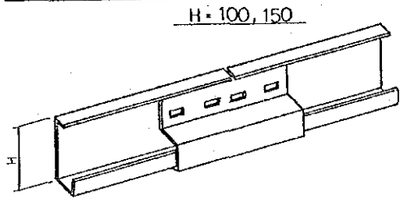


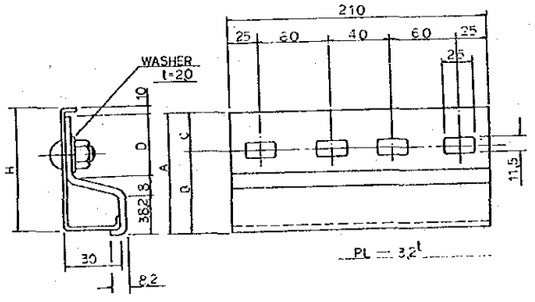
STRAIGHT TRAY



STRAIGHT CONNECTOR

H = 100, 150





NOTE

1) THE FIGURES ARE TYPICAL VALUES.

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

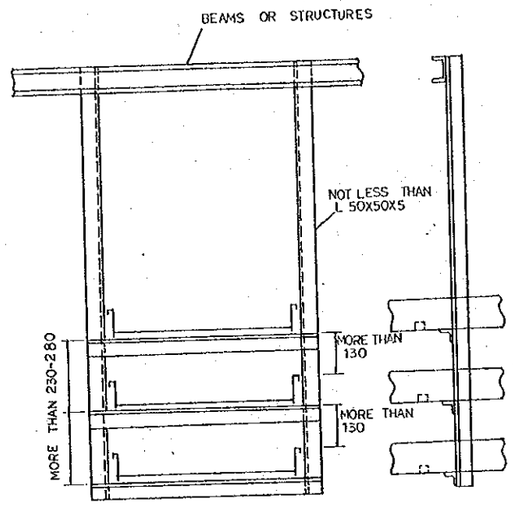
STANDARD CABLE TRAY — 1

JAPAN INTERNATIONAL COOPERATION AGENCY

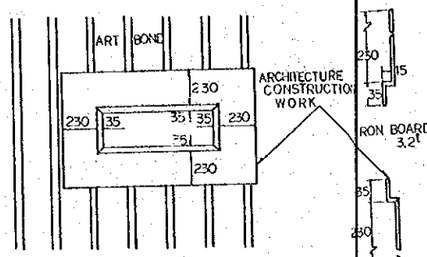
TOKYO JAPAN

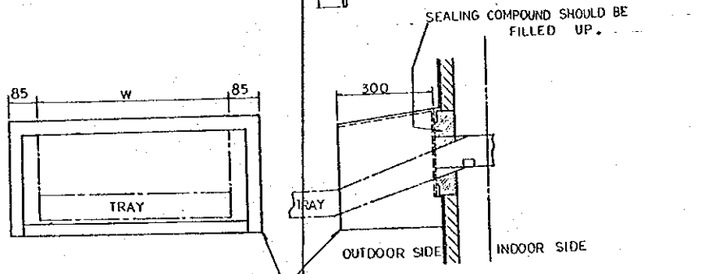
APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa			H. Kondo
DRAWING NO.	SCALE	DATE	
WET-1201	NONE	10TH JAN 1990	

ARRANGMENT AND SUPPORTING METHOD



RAIN GUARD (EXAMPLE)

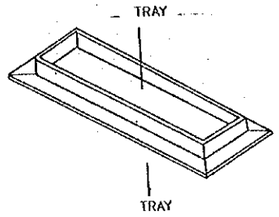




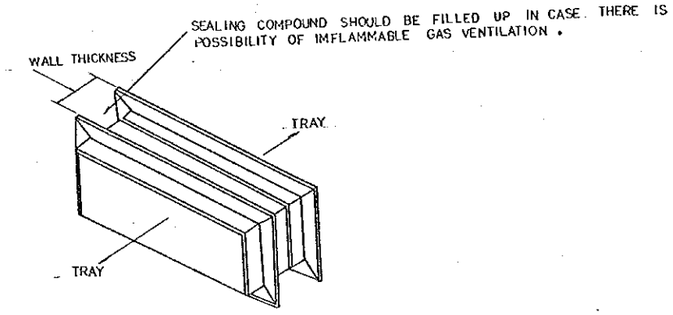
RAIN GUARD (THICKNESS 2.3t)

THE GUARD INSTALLATION WORK SHOULD BE INCLUDED IN THE CABLE TRAY INSTALLATION WORK AND WELDDED TO THE BOARD OF THE ARCHITECTURE CONSTRUCTION WORK.

A DRESSED PLATE FOR A FLOOR PENETRATION PART

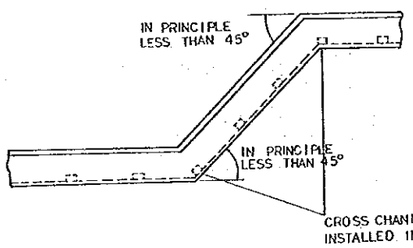


A DRESSED PLATE FOR A WALL PENETRATION PART



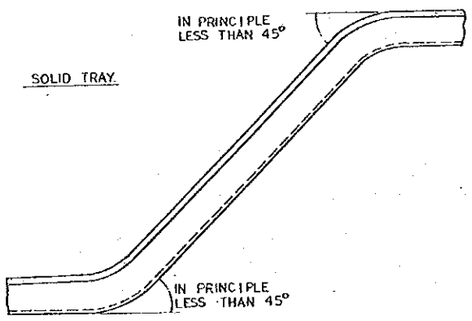
CONSTRUCTION OUTLINE IN TRAY RISER ELBOWS FOR LEVEL CHANGE

LADDER TRAY



CROSS CHANNELS IN THESE PARTS. SHOULD BE INSTALLED IN ANY CASE.

SOLID TRAY.



MAIN ROUTE ARRANGEMENT AND SUPPORTING METHOD IN CABLE TRAY

(1) ARRANGEMENT
THE CABLE TRAYS IN THE MAIN ROUTE SHOULD BE INSTALLED AS THE SAME ROUTE THAT POWER OF LOW VOLTAGE, CONTROL, INSTRUMENT AND COMPUTER CABLE HAVE BEEN LAID IN EACH TRAY.
THE TRAYS SHOULD ALSO BE SUPPORTED WITH THE SAME SUPPORT.
IN PRINCIPLE, THE TRAYS SHOULD BE ARRANGED ① C.T, ② T.T, ③ C.T, ④ P.T AND ⑤ B.T (BUS TIE) FROM THE UNDER PART.

(2) SUPPORTING METHOD
a. IN PRINCIPLE, THE TRAYS SHOULD BE SUPPORTED IN BOTH SIDES OF THEM, AND THE SUPPORTING AND SUSPENDING IRON MATERIALS SHOULD BE SET AT EVERY INTERVAL OF LESS THAN TWO METERS AND ALSO WELDDED.
b. IRON MATERIALS IN THE UNDER-MENTIONED SHOULD BE USED.

SUPPORTING IRON MATERIALS	NOT LESS THAN L 50X50X5
SUSPENDING IRON MATERIALS	NOT LESS THAN L 50X50X5
AUXILIARY BEAM MATERIALS	NOT LESS THAN C 75X40X5

ROUND STEEL CAN ALSO BE USED IN CASE THERE IS NOT SO MUCH NECESSITY TO REINFORCE SUCH AS ONE STAGE SUSPENDING TRAY.
C. SPACE BETWEEN TRAY STAGES SHOULD BE REQUIRED MORE THAN 130 mm.

ATTENTION POINTS ON TRAY CONSTRUCTION WORK

(1) ANGLE IN TRAY LEVEL CHANGE PART SHOULD BE LESS THAN 45°.

(2) A DRESSED BOARD SHOULD BE INSTALLED IN THE PARTS THAT TRAYS HAVE PENETRATED THROUGH A WALL, FLOOR, ETC FOR KEEPING ITS FINE SIGHT AND A RAIN GUARD SHOULD ALSO BE INSTALLED SO AS TO PROTECT INVASION OF RAIN WATER.

NOTE
1) THE FIGURES ARE TIPICAL VALUES.

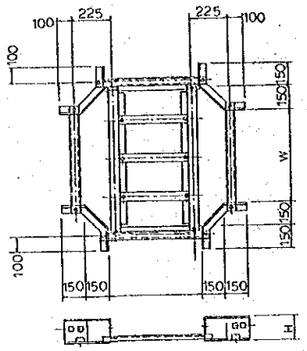
PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO.1 AND NO.2

STANDARD CABLE TRAY — 2

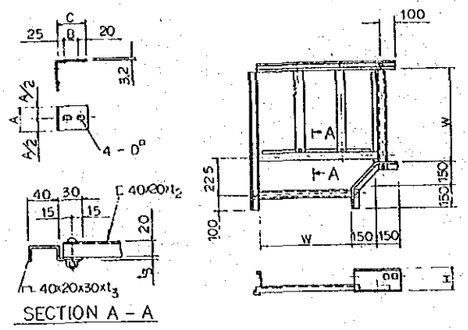
JAPAN INTERNATIONAL COOPERATION AGENCY
TOKYO JAPAN

APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa			H. Kondo
DRAWING NO.		SCALE	DATE
WET-1202		NONE	10TH JAN 1990

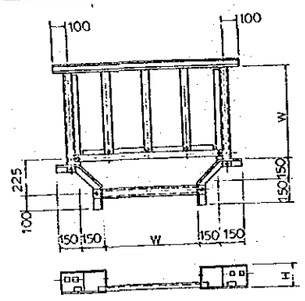
X TYPE TRAY



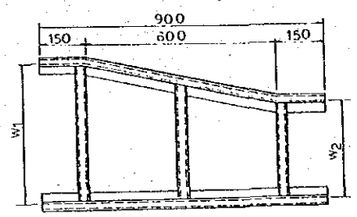
L TYPE TRAY



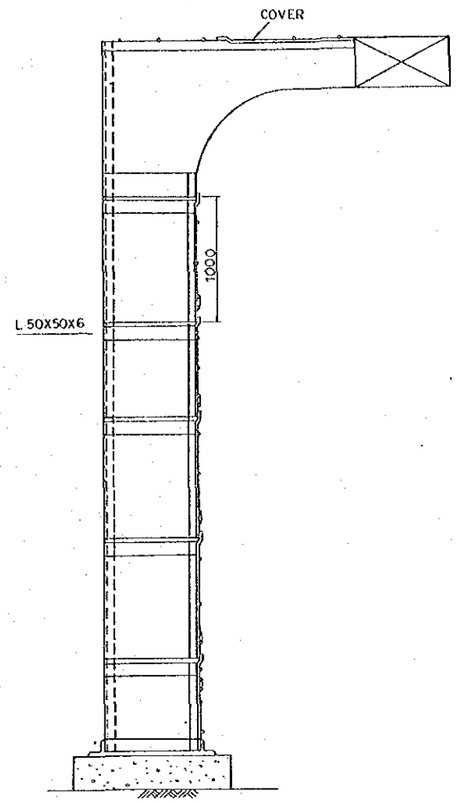
T TYPE TRAY



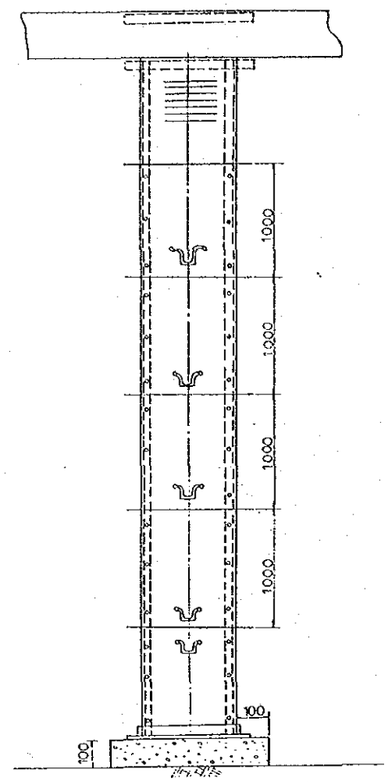
REDUCER



CABLE SHAFT SIDE VIEW

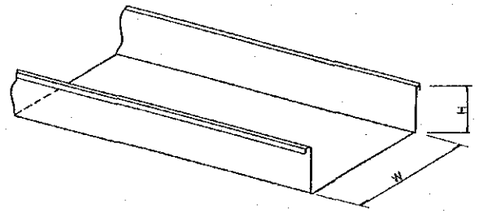


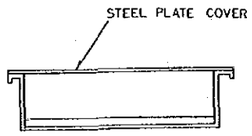
CABLE SHAFT FRONT VIEW

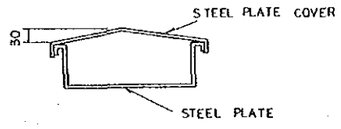


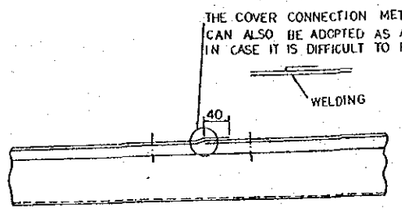
NOTE
1) THE FIGURES ARE TYPICAL VALUES.

CABLE TRAY DETAIL









STANDARD LENGTH OF THE COVER SHALL BE 1000 OR 600 mm.

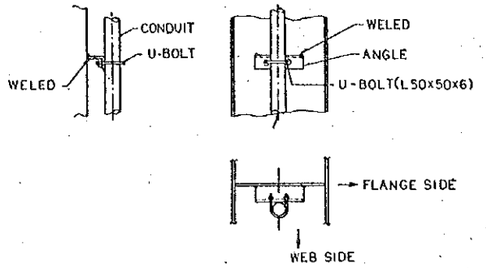
PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO.1 AND NO.2

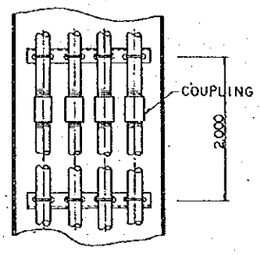
STANDARD CABLE TRAY — 3

JAPAN INTERNATIONAL COOPERATION AGENCY
TOKYO JAPAN

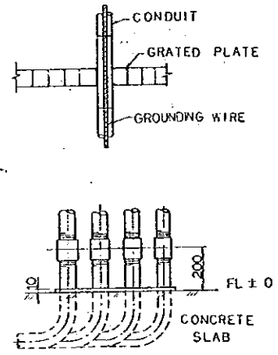
APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Akio Oiwa		K. Ishii	H. Kondo
DRAWING NO. WET-1203		SCALE NONE	DATE 10TH JAN 1990



1. IN CASE PIPING IS FIXED TO CONDUIT AND BOX IT SHALL BE FIXED TO THE WEB PLATE.
2. THE CONDUIT SHALL BE SUPPORTED AT LEAST EVERY 2000mm.

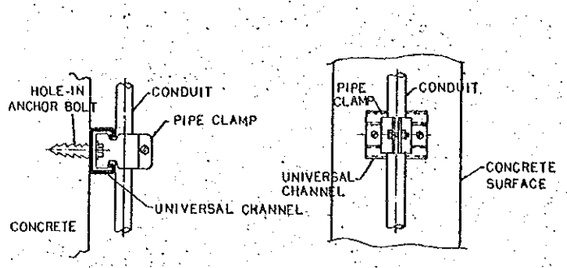


SUPPORTS WITH ANGLE AND U-BOLT

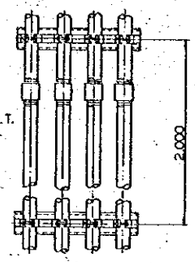


1. THE GROUNDING WIRE THAT PENETRATES THROUGH GRATED PLATE SHALL BE ATTACHED TO THE CONDUIT.
2. THE ELBOW FOR CONDUIT OR BENT CONDUIT SHALL BE TREATED INSIDE THE CONCRETE SLAB.
3. IN CASE OF CONDUITS PROTRUDING UPWARD FROM THE CONCRETE SLAB SURFACE THE HIGHT SHALL BE FL+200mm.

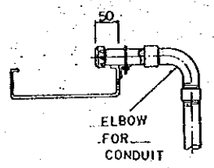
RISING AND PENETRATION OF PIPING



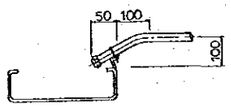
1. IN CASE PIPING IS FIXED TO THE CONCRETE SURFACE, IT SHALL BE FIXED BY USING HOLE-IN ANCHOR BOLT.
2. THE CONDUIT SHALL BE SUPPORTED AT LEAST EVERY 2000mm.



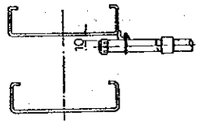
SUPPORTS WITH UNIVERSAL CHANNEL AND PIPE CLAMP



1. ANY ALL CONDUITS WITH A DIAMETER OF 54mm OR OVER SHALL BE INSTALLED HORIZONTALLY.

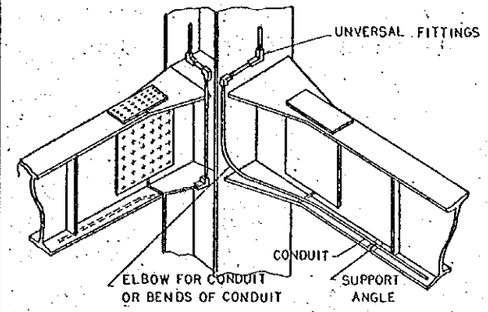


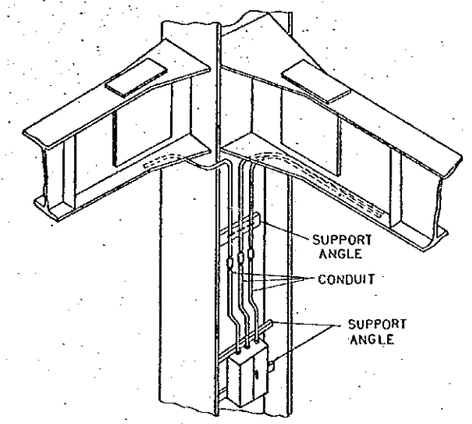
2. ANY ALL CONDUITS WITH A DIAMETER OF LESSTHAN 54mm SHALL BE MOUNTED ON THE UPPER PART OF THE CABLE TRAY AFTTER BENDING.
3. IN CASE A CONDUIT IS INSTALLED ON THE LOWER PART OF THE CABLE TRAY A CLEARANCE OF 10mm OR OVER SHALL BE PROVIDED BETWEEN THE CABLE TRAY AND CONDUIT.



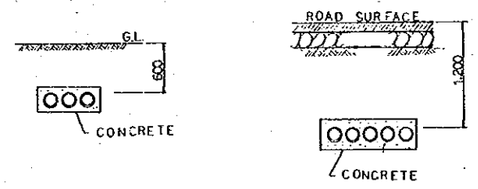
4. IN PRINCIPLE ANY BOX TYPE CABLE TRAY SHALL BE ATTACHED TO THE CONDUIT ON THE SIDE OF THE BOX.

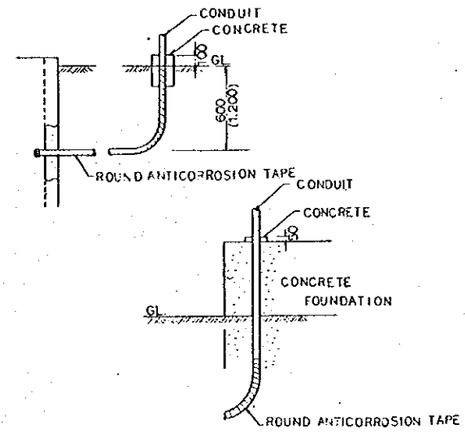
CABLE TRAY AND PIPING



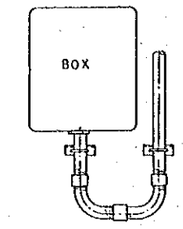


PIPING PROCEDURES

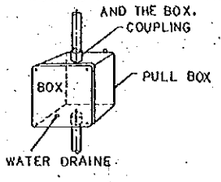


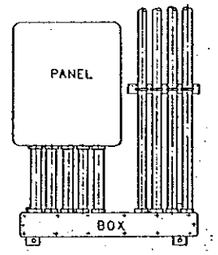


OUT DOOR UNDER GROUNDING PIPING

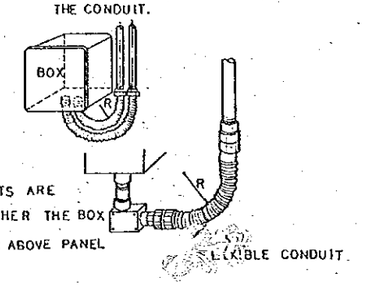


1. IN PRINCIPLE OUT DOOR CONDUIT SHALL BE ATTACHED TO THE BOTTOM OF BOX OR PANEL.
2. IN CACE THE CONDUIT IS ATTACHED TO THE UPPER PART OF BOX SUCH BOX SHALL NOT BE OF CONSTRUCTION CAUSING ENTRY OF ANY WATER FROM THE CONNECTION BETWEEN THE CONDUIT AND THE BOX.



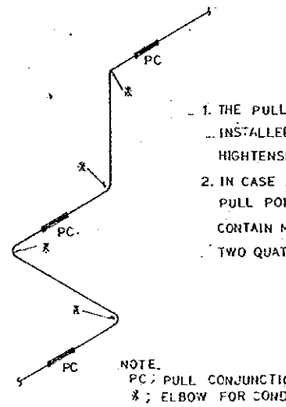


3. IN CASE FLEXIBLE CONDUIT IS USED SUFFICIENT RADIUS(R) SHALL BE GIVEN SO AS TO AVOID EXCESSIVE BENDING OF THE CONDUIT.



4. IN CASE NUMBER OF CONDUITS ARE ATACHED THE PANEL ANOTHER THE BOX SHALL BE PROVIDED UNDER ABOVE PANEL

PIPING TO BOX OR PANEL



1. THE PULL CONJUCTION PIPES SHALL BE INSTALLED AT A RUN OF CONDUIT FOR HIGHTENSION CABLE PULL POINT.
2. IN CASE A RUN OF CONDUIT BETWEEN PULL POINT AND PULL POINT SHALL NOT CONTAIN MORE THAN THE EQUIVALENT OF TWO QUATER BENDS (180 DEGREES, TOTAL).

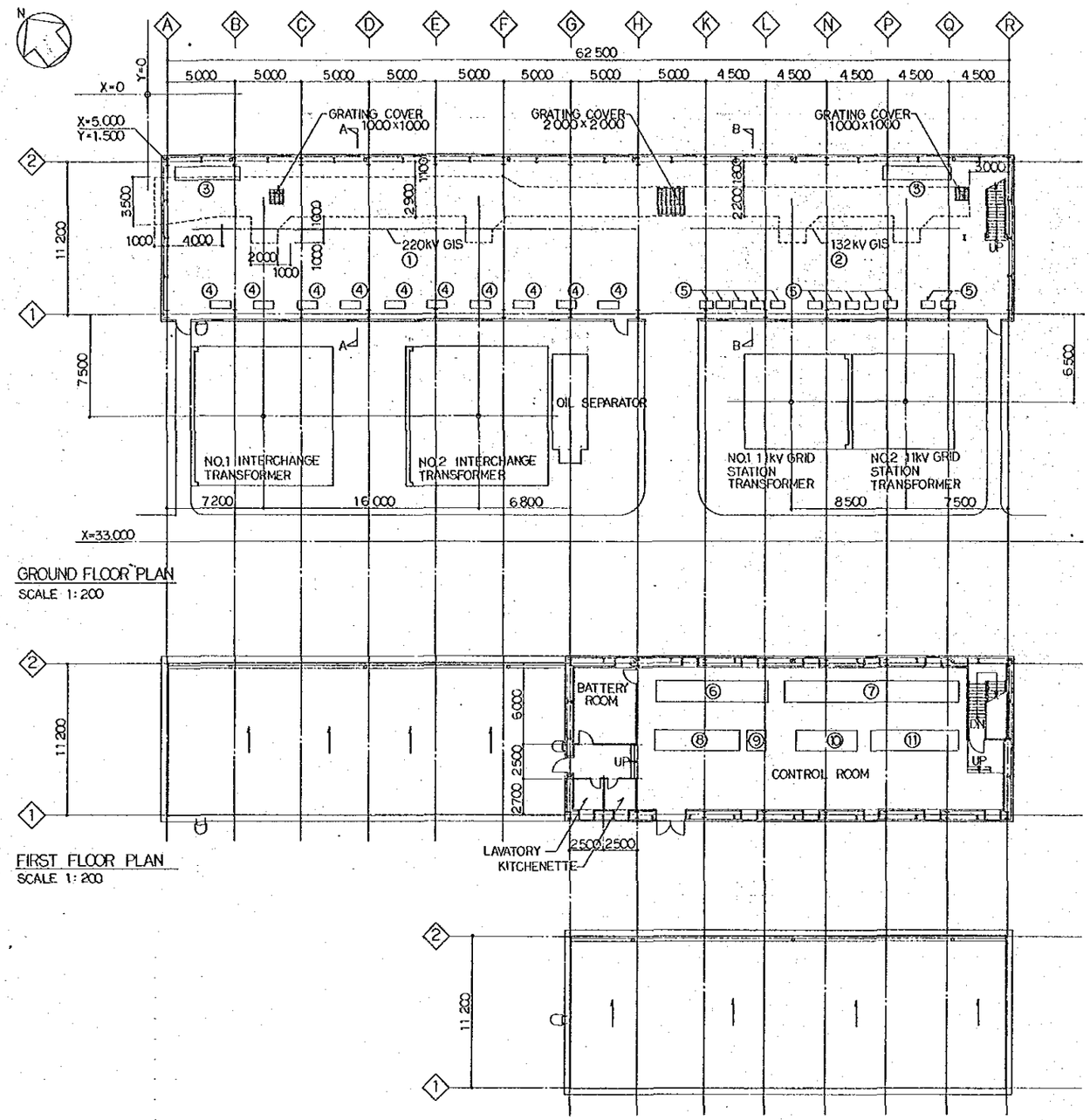
NOTE.
PC; PULL CONJUNCTION PIPE
※; ELBOW FOR CONDUIT (QUATER BENDS)

PULL CONJUCTION PIPES IN ONE RUN

NOTE
1) THE FIGURES ARE TIPICAL VALUES.

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO.1 AND NO.2
STANDARD PIPING SCHEME
JAPAN INTERNATIONAL COOPERATION AGENCY
TOKYO JAPAN

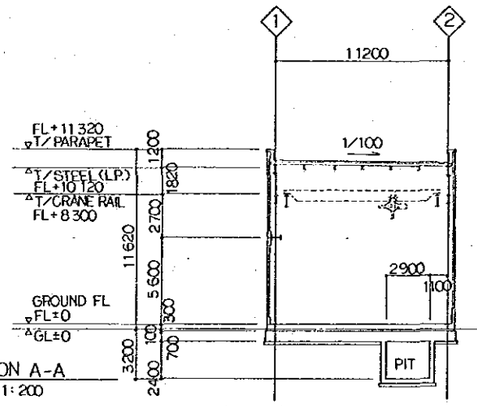
APPROVED BY	REVIEWED BY	CHECKED BY	DRAWN BY
Shin Oiwa		K. Kondo	H. Kondo
DRAWING NO.		SCALE	DATE
WET-1204		NONE	10TH JAN 1990



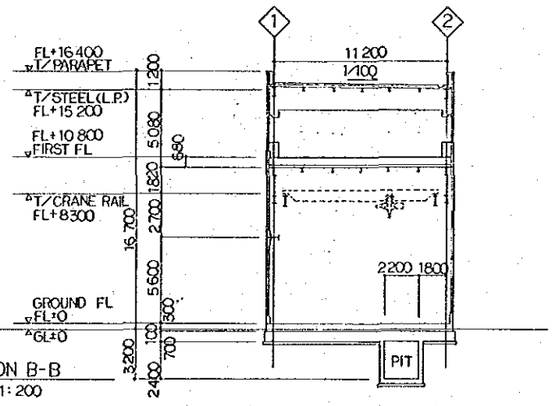
GROUND FLOOR PLAN
SCALE 1:200

FIRST FLOOR PLAN
SCALE 1:200

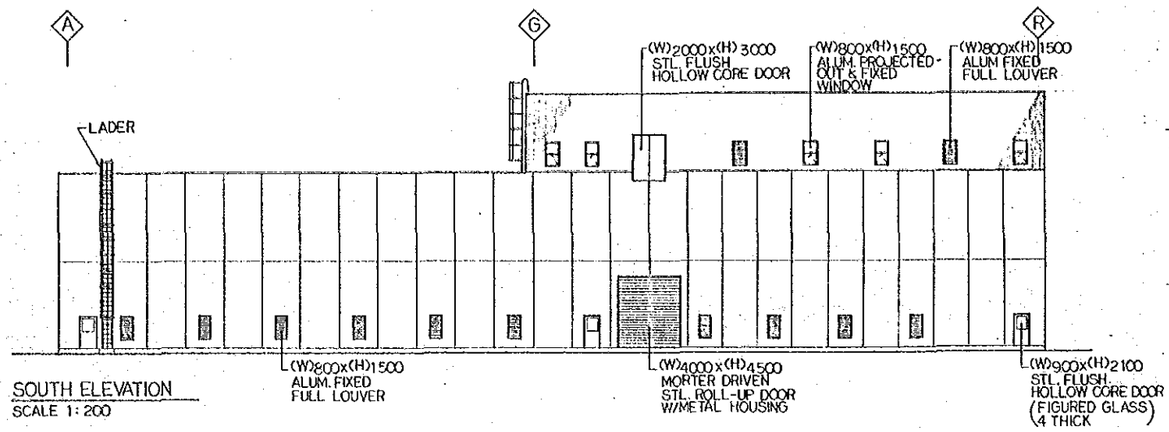
ROOF PLAN
SCALE 1:200



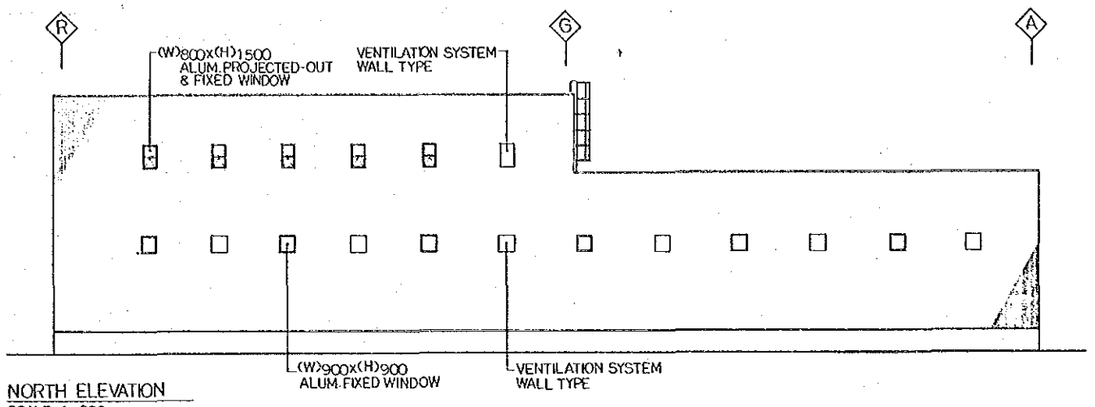
SECTION A-A
SCALE 1:200



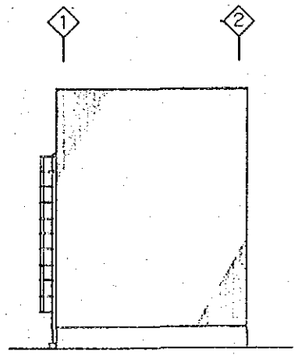
SECTION B-B
SCALE 1:200



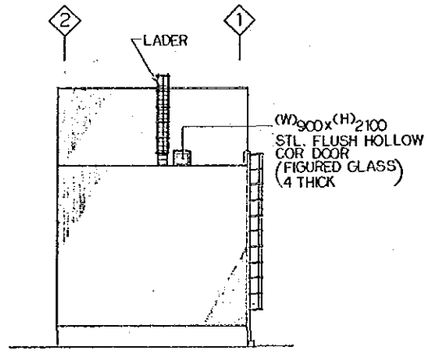
SOUTH ELEVATION
SCALE 1:200



NORTH ELEVATION
SCALE 1:200



EAST ELEVATION
SCALE 1:200



WEST ELEVATION
SCALE 1:200

GRAPHIC SCALES
0 1 5 10m
SCALE 1:200

EQUIPMENT LIST

NO.	ITEM	TON
①	220kV GIS	225.0
②	132 kV GIS	180.0
③	AIR CONP.	3.0/E
④	CONTROL PANEL	0.5/E
⑤	CONTROL PANEL	0.5/E
⑥	220kV LINE & BUS PROTECTIVE RELAY PANEL	5.0
⑦	132kV LINE & BUS PROTECTIVE RELAY PANEL	8.1
⑧	CARRIER EQUIPMENT	2.5
⑨	RTU	1.0
⑩	220kV LINE & BUS CONTROL PANEL	2.5
⑪	132kV LINE & BUS CONTROL PANEL	3.5

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO.1 AND NO.2
SUBSTATION AREA
ARCHITECTURAL DRAWING SHT-1
JAPAN INTERNATIONAL COOPERATION AGENCY
TOKYO JAPAN

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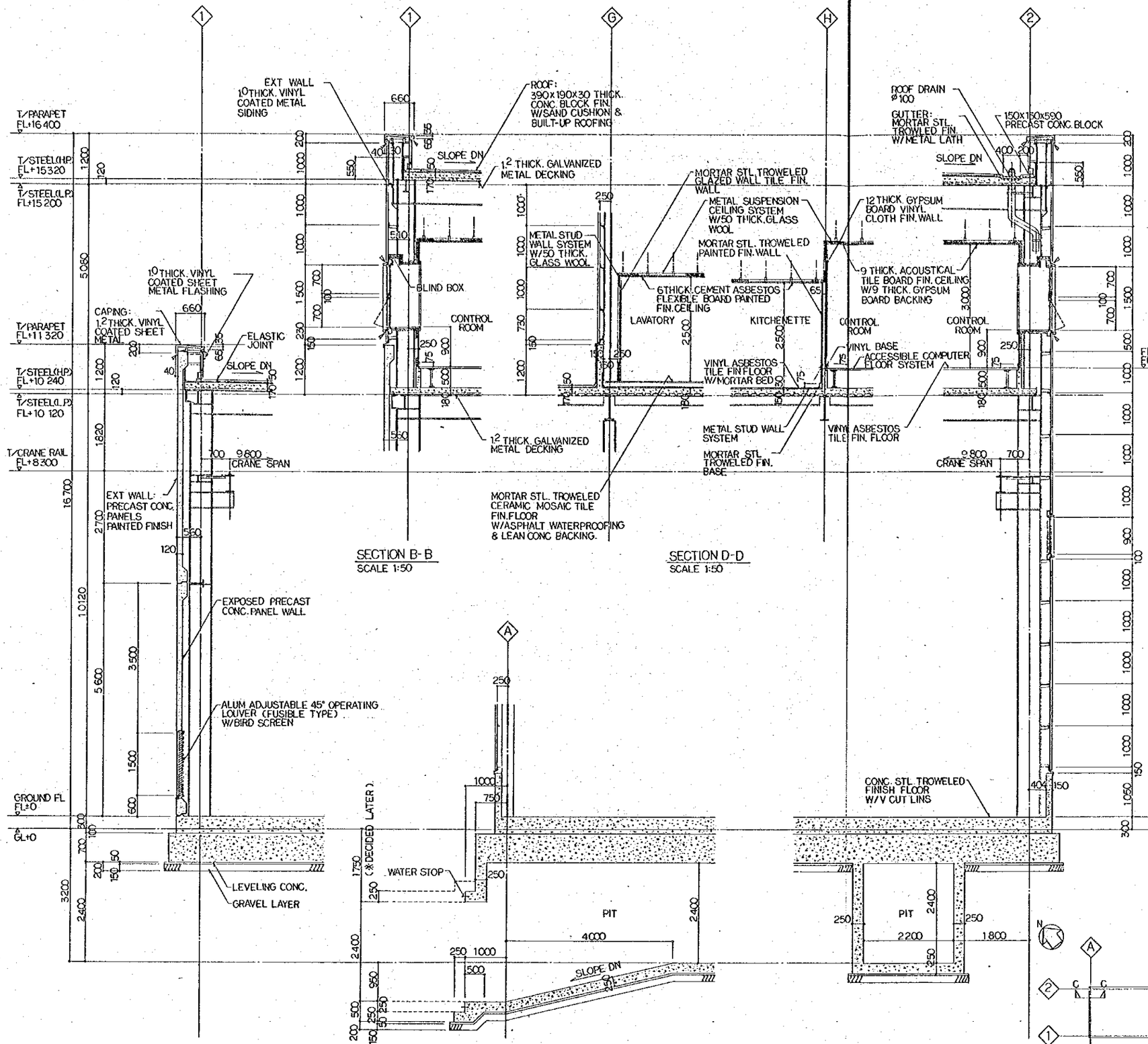
DRAWING NO.		SCALE	DATE
WAT-1601		1:200	10 JAN. 1990



SECTION B-B
SCALE 1:50

SECTION D-D
SCALE 1:50

SECTION A-A
SCALE 1:50

SECTION C-C
SCALE 1:50

SECTION E-E
SCALE 1:50

SECTION F-F
SCALE 1:50

GRAPHIC SCALE
0 50 100 250 cm
SCALE 1:50

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO.1 AND NO.2
SUBSTATION AREA
ARCHITECTURAL DRAWING SHT-2
JAPAN INTERNATIONAL COOPERATION AGENCY
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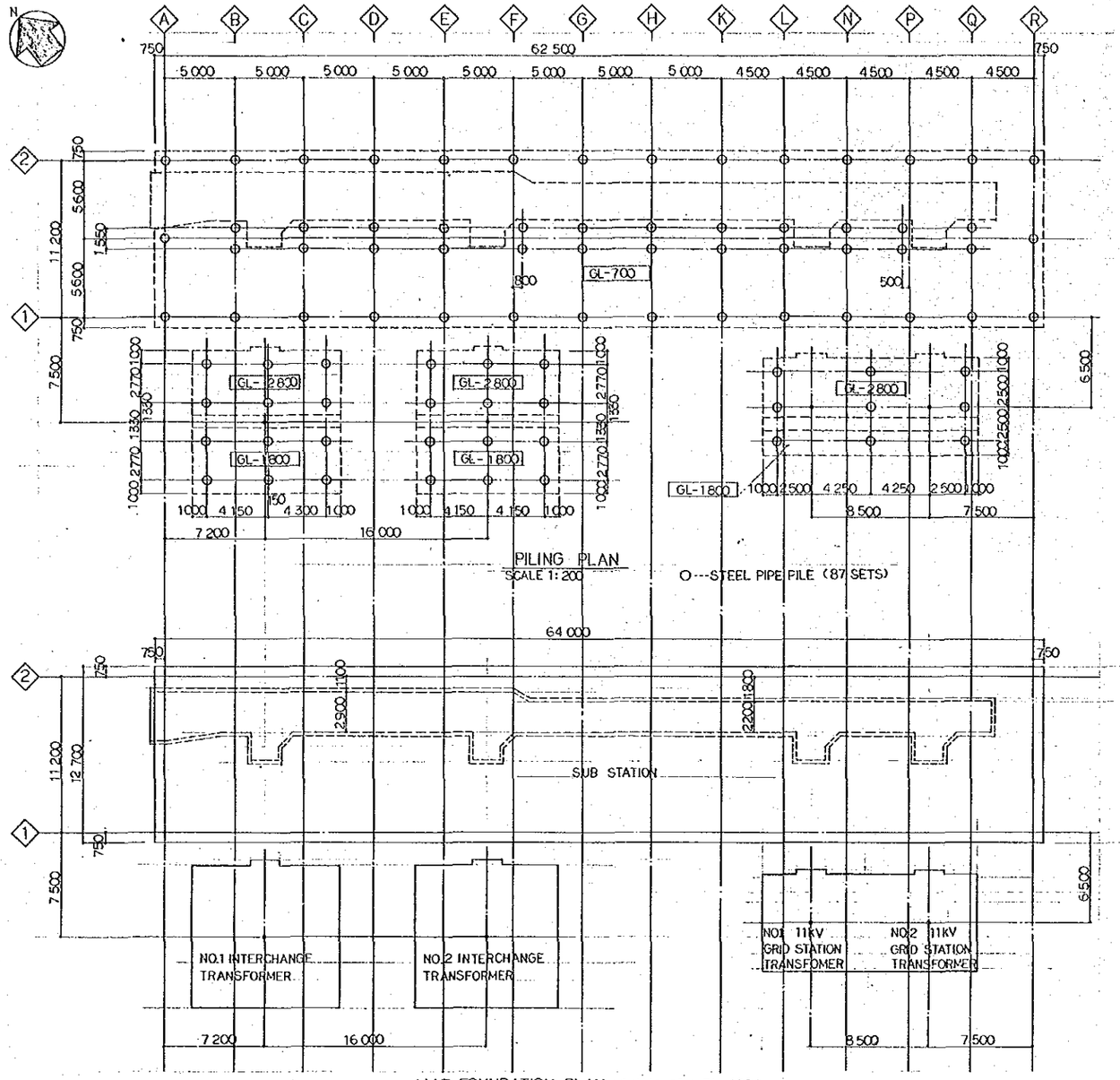
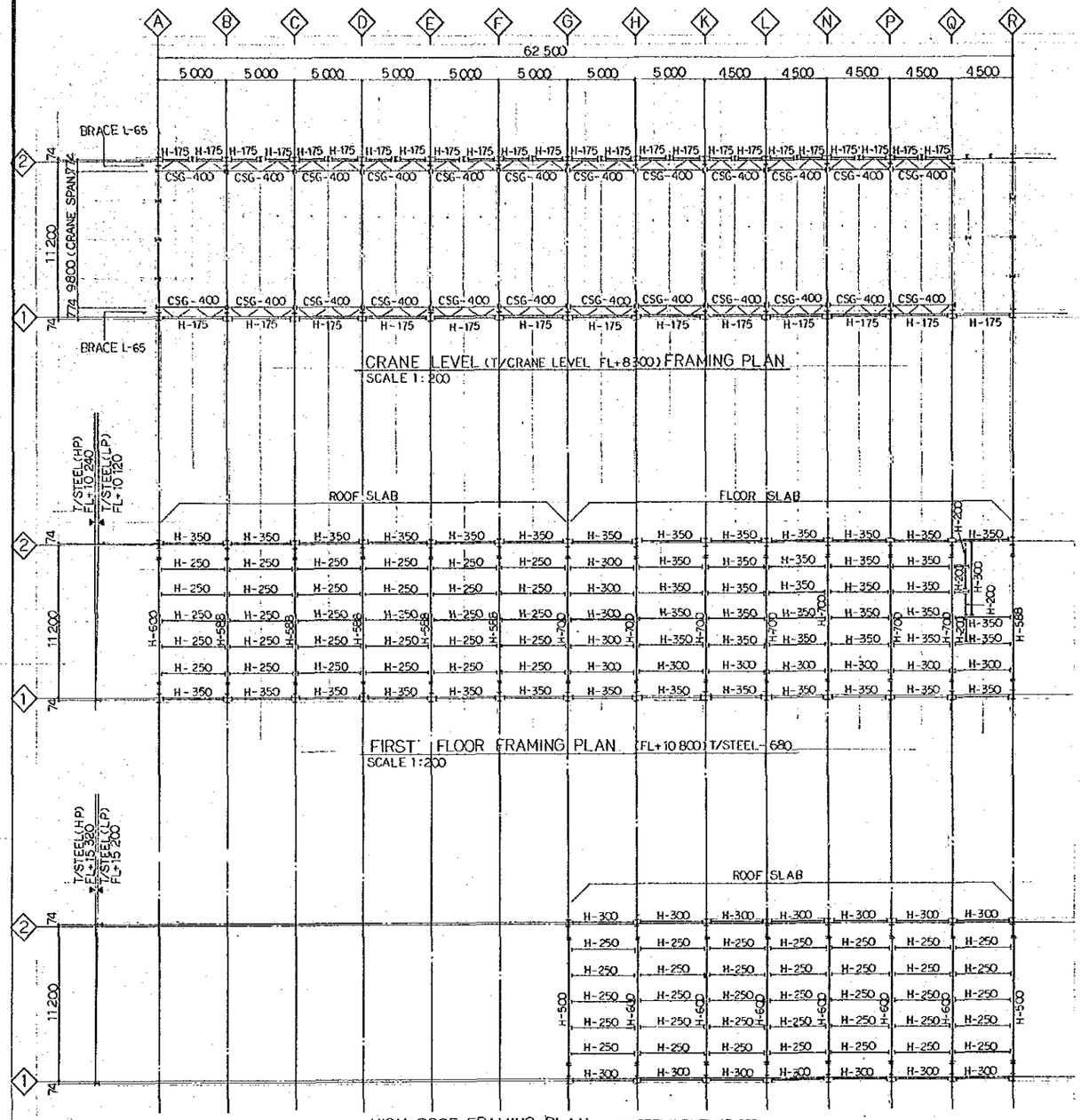
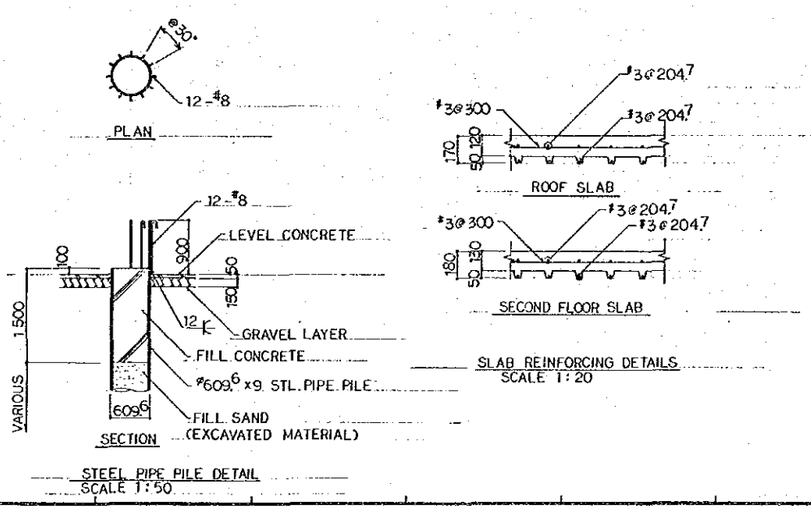
DRAWING NO.		SCALE	DATE
WAT-1602		1:50	10 JAN. 1990







NOTES

1. DIMENSIONS INDICATED BY [GL-] MARK SHALL BE LEVEL OF PILE TOP.

MARK	SIZE OF MEMBER
H-175	H-175×90×5×8
H-200	H-200×100×5.5×8
H-250	H-250×125×6×9
H-300	H-300×150×6.5×9
H-350	H-350×175×7×11
H-400	H-400×200×8×13
H-440	H-440×300×11×18
H-500	H-500×200×10×16
H-588	H-588×300×12×20
H-600	H-600×200×11×17
H-700	H-700×300×13×24
CSG-400	H-400×200×8×13
L-65	L-65×65×6
L-90	L-90×90×10
2L-90	2L-90 90×10

GRAPHIC SCALE

0 1 5 10m
SCALE 1:200

0 50 100 250cm
SCALE 1:50

0 10 50 100cm
SCALE 1:20

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

SUBSTATION AREA
STRUCTURAL DRAWING SHT-1

JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

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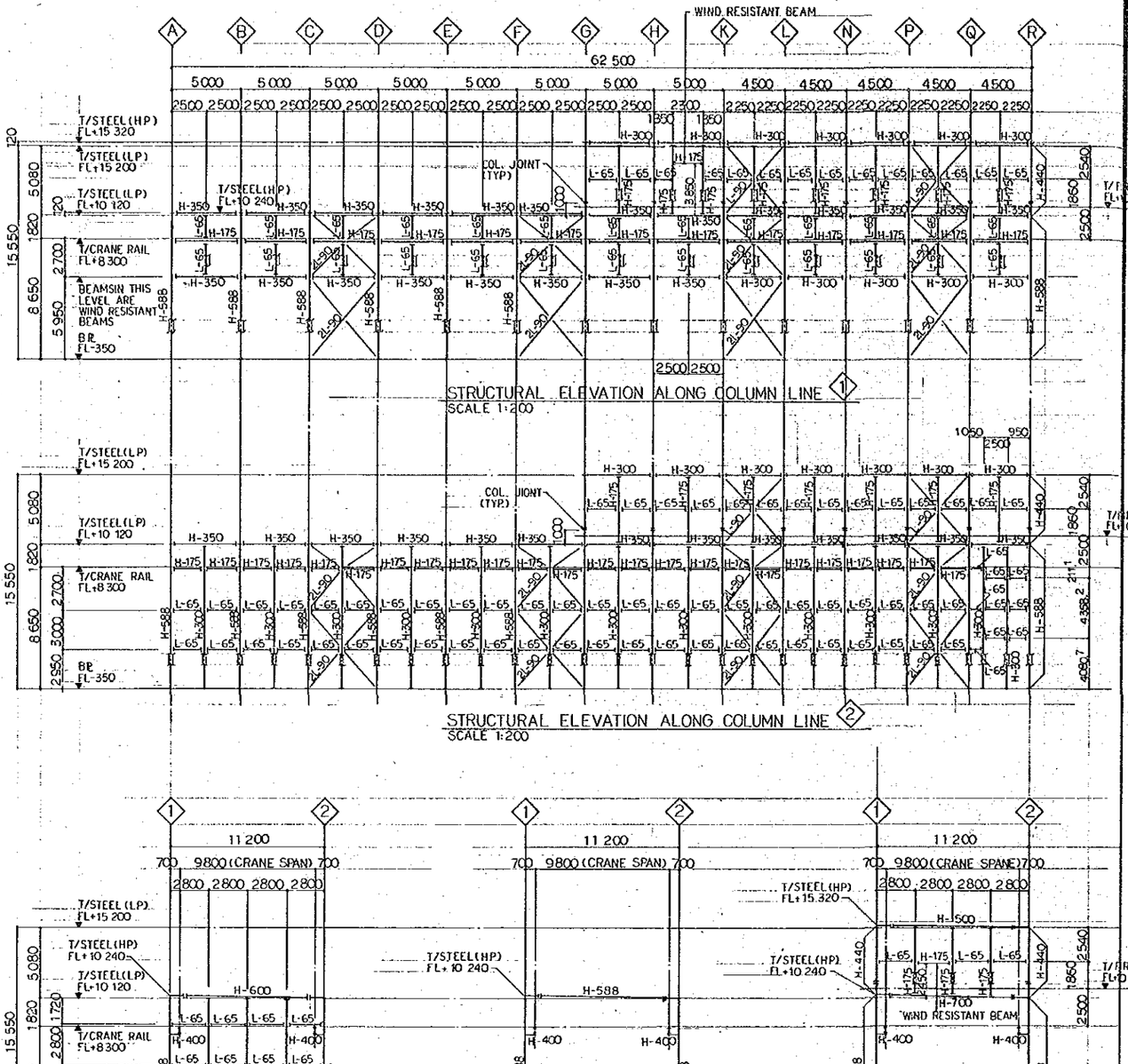

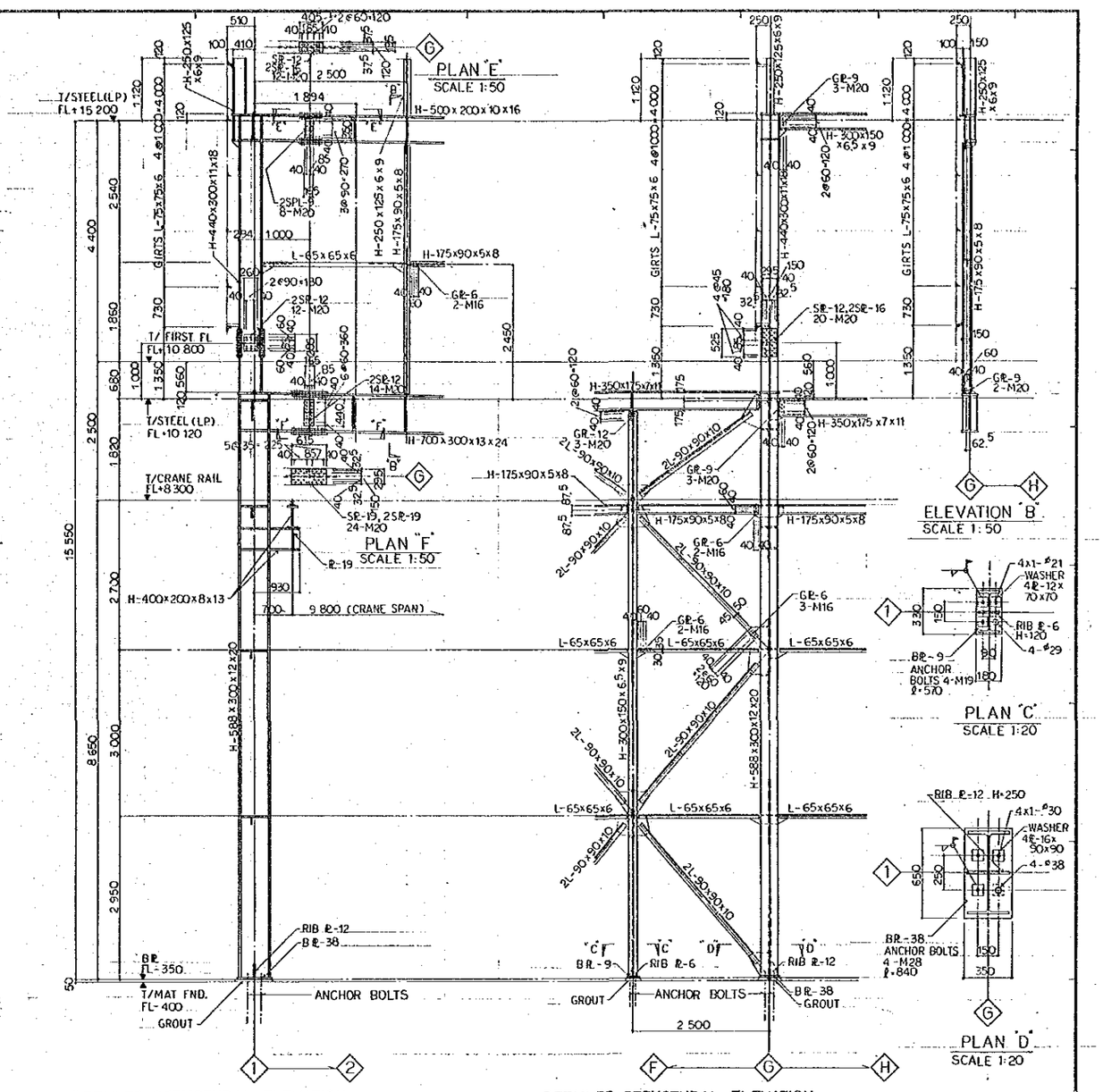

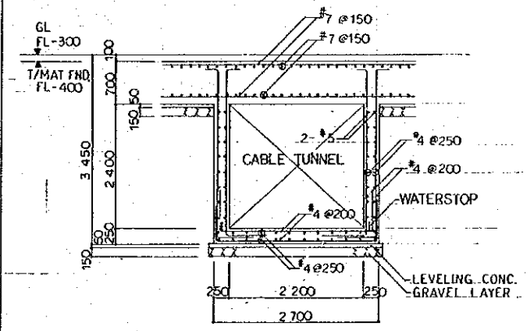

TYPICAL REINFORCEMENT
SCALE 1:50

MARK	SIZE OF MEMBER
H-175	H-175× 90× 5× 8
H-200	H-200×100×5.5× 8
H-250	H-250×125× 6× 9
H-300	H-300×150×6.5× 9
H-350	H-350×175× 7×11
H-400	H-400×200× 8×13
H-440	H-440×300×11×18
H-500	H-500×200×10×16
H-588	H-588×300×12×20
H-600	H-600×200×11×17
H-700	H-700×300×13×24
CSG-400	H-400×200× 8×13
L-65	L-65×65× 6
L-90	L-90×90×10
2L-90	2L-90×90×10

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

SUBSTATION AREA
STRUCTURAL DRAWING SHT-2

JAPAN INTERNATIONAL COOPERATION AGENCY

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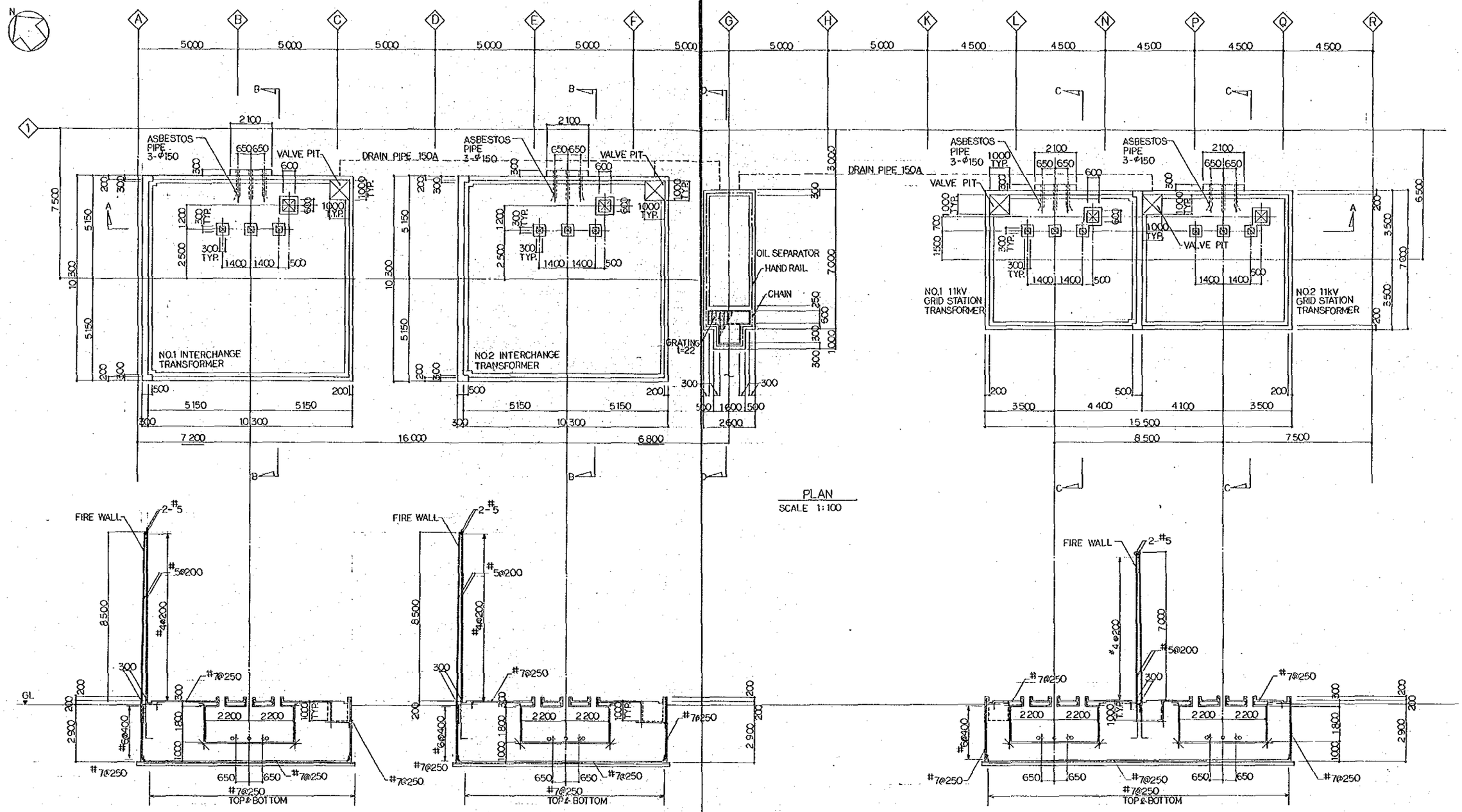
WAT - 1604 a	1:50	10 JAN. 1990



PLAN
SCALE 1:100

SECTION A-A
SCALE 1:100

SECTION B-B
SCALE 1:100

SECTION C-C
SCALE 1:100

SECTION D-D
SCALE 1:100

GRAPHIC SCALES
0 1 5m
SCALE 1:100

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO.1 AND NO.2

SUBSTATION AREA
TRANSFORMER YARD FOUNDATION

JAPAN INTERNATIONAL COOPERATION AGENCY
TOKYO JAPAN

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	Y. Kawa	Y. Kawa	
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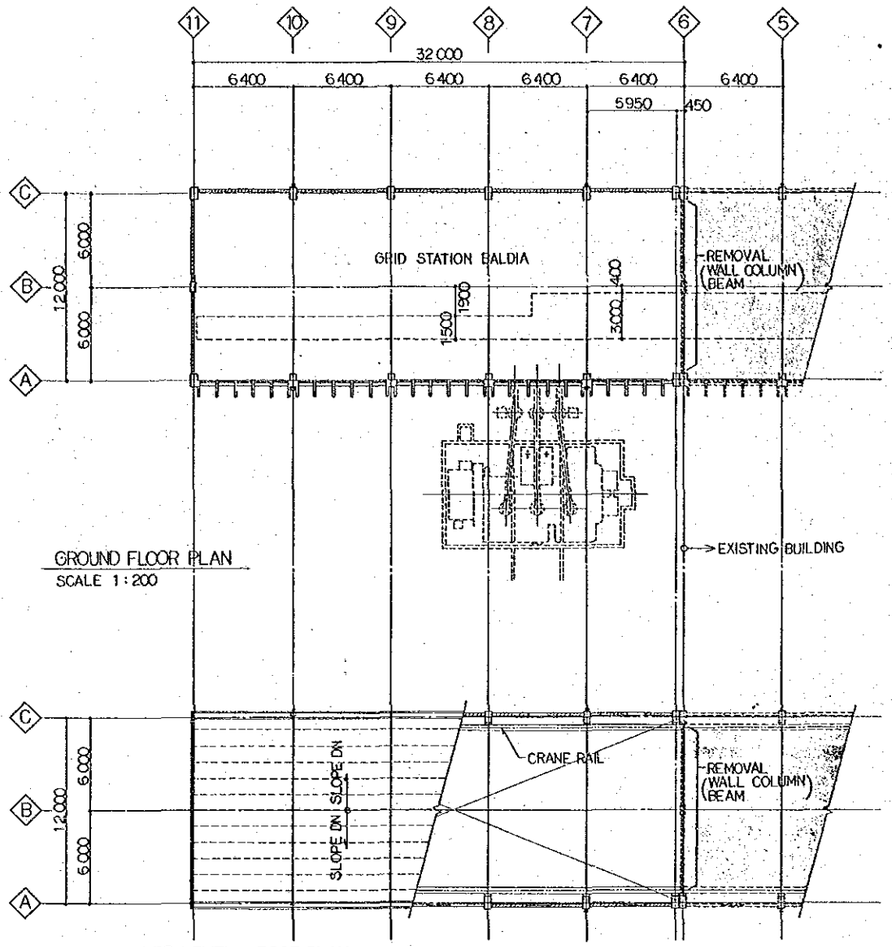
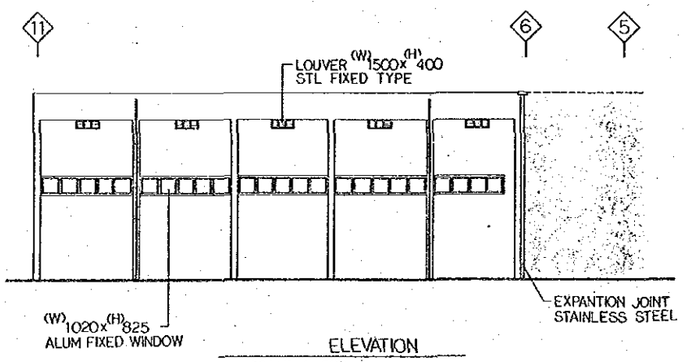
WAT-1604 b	1:100	10 JAN. 1990	

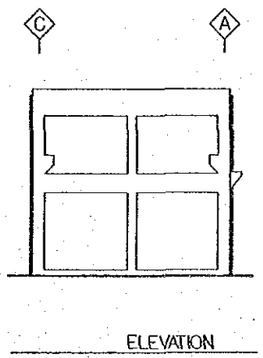


GROUND FLOOR PLAN
SCALE 1 : 200

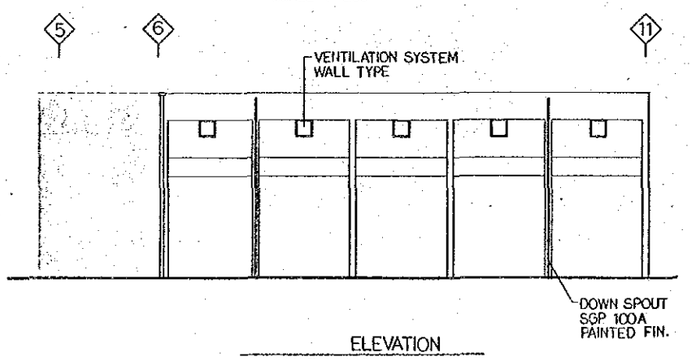
CRANE GIRDER LEVEL & ROOF PLAN
SCALE 1 : 200



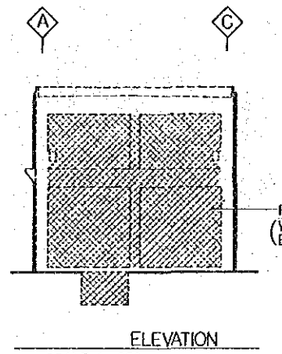
ELEVATION
SCALE 1 : 200



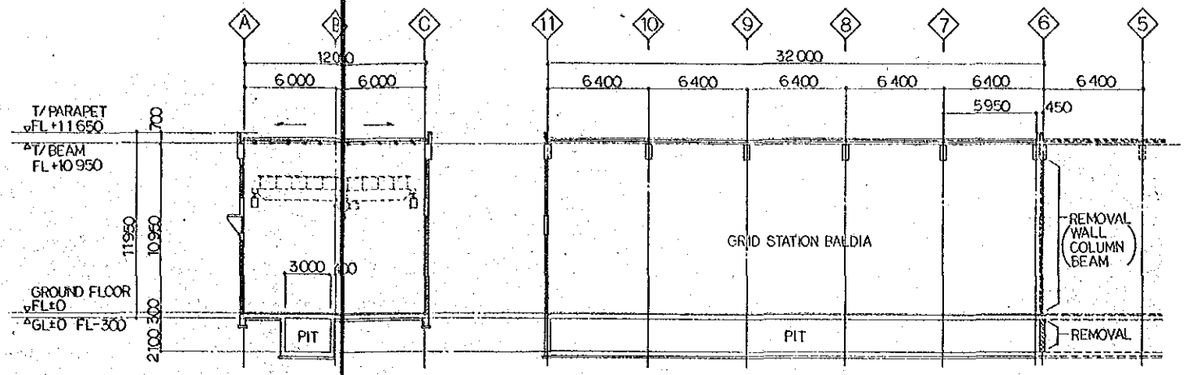
ELEVATION
SCALE 1 : 200



ELEVATION
SCALE 1 : 200

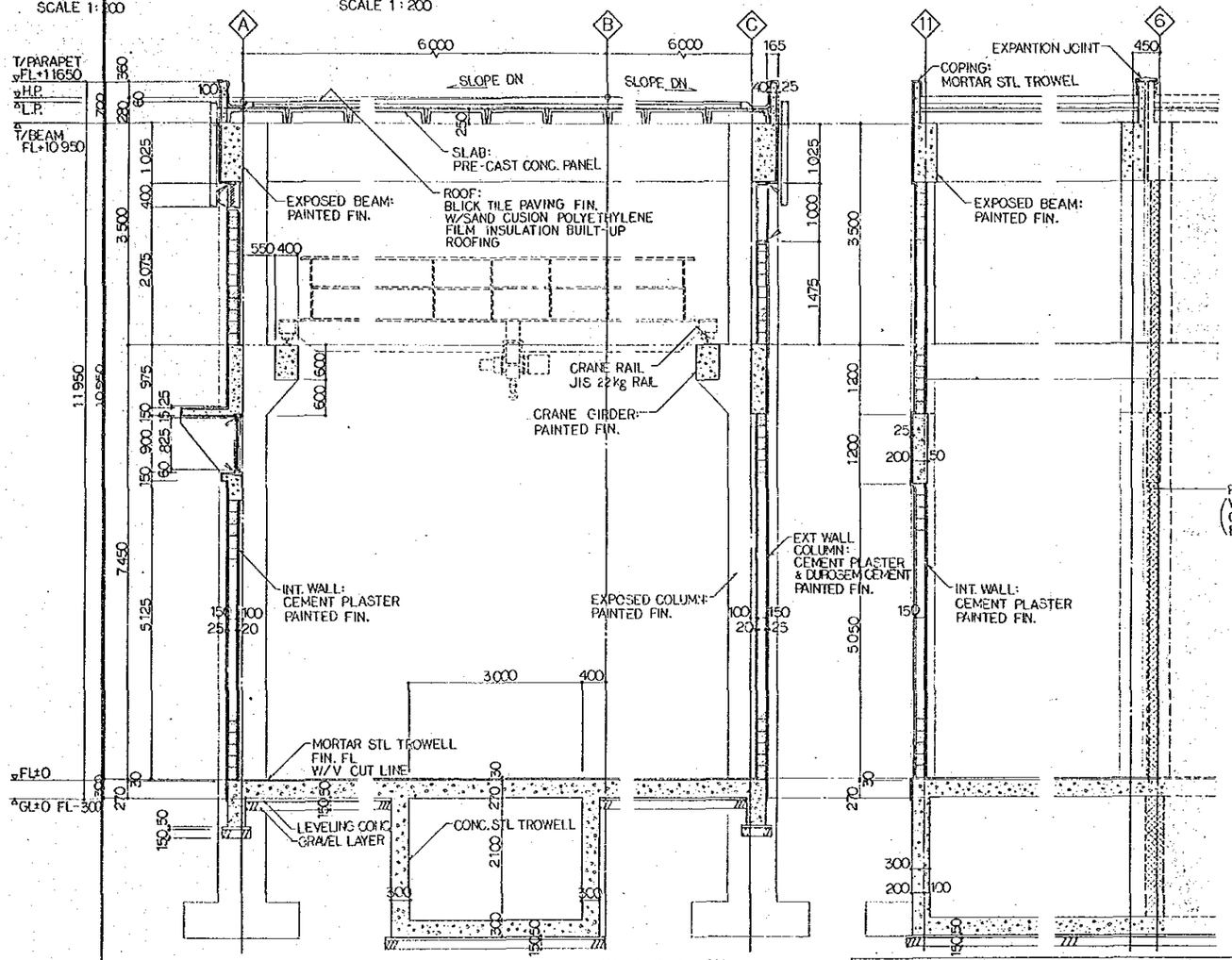


ELEVATION
SCALE 1 : 200



SECTION A - A
SCALE 1 : 200

SECTION B - B
SCALE 1 : 200



WALL SECTIONS
SCALE 1 : 50

GRAPHIC SCALES
0 1 5 10m
SCALE 1 : 200
0 50 100 250cm
SCALE 1 : 50

PAKISTAN
KARACHI ELECTRIC SUPPLY CORPORATION
WEST WHARF THERMAL POWER PLANT PROJECT
UNITS NO.1 AND NO.2
GRID STATION BALDIA
ARCHITECTURAL DRAWING
JAPAN INTERNATIONAL COOPERATION AGENCY
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	H. Kawano	H. Kawano	H. Hashiba
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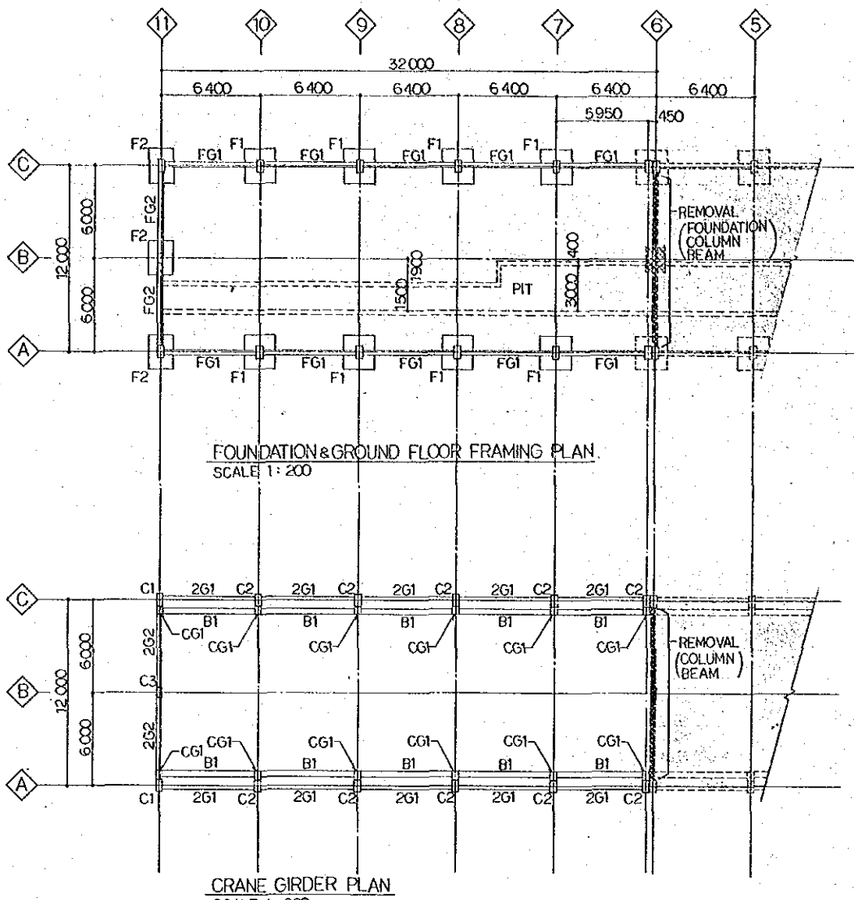
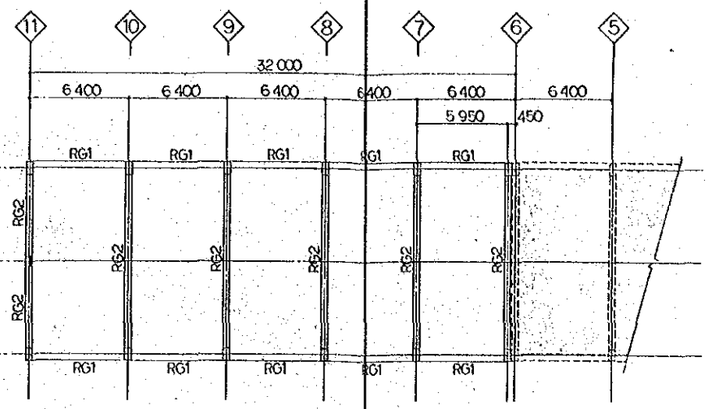
WAT-1615	1:200	10 JAN. 1990	

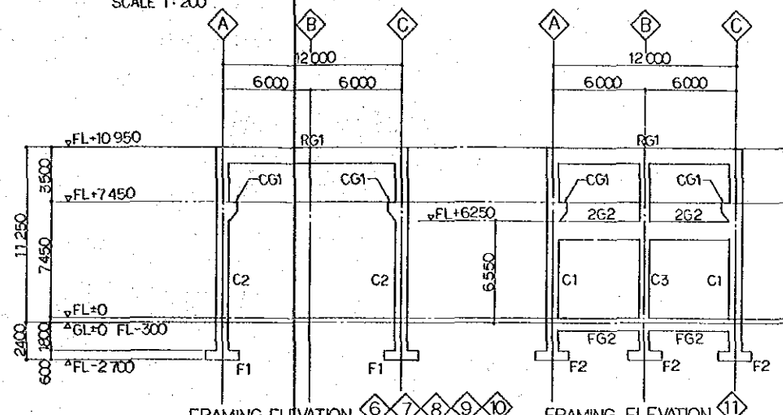


FOUNDATION & GROUND FLOOR FRAMING PLAN
SCALE 1 : 200

CRANE GIRDER PLAN
SCALE 1 : 200

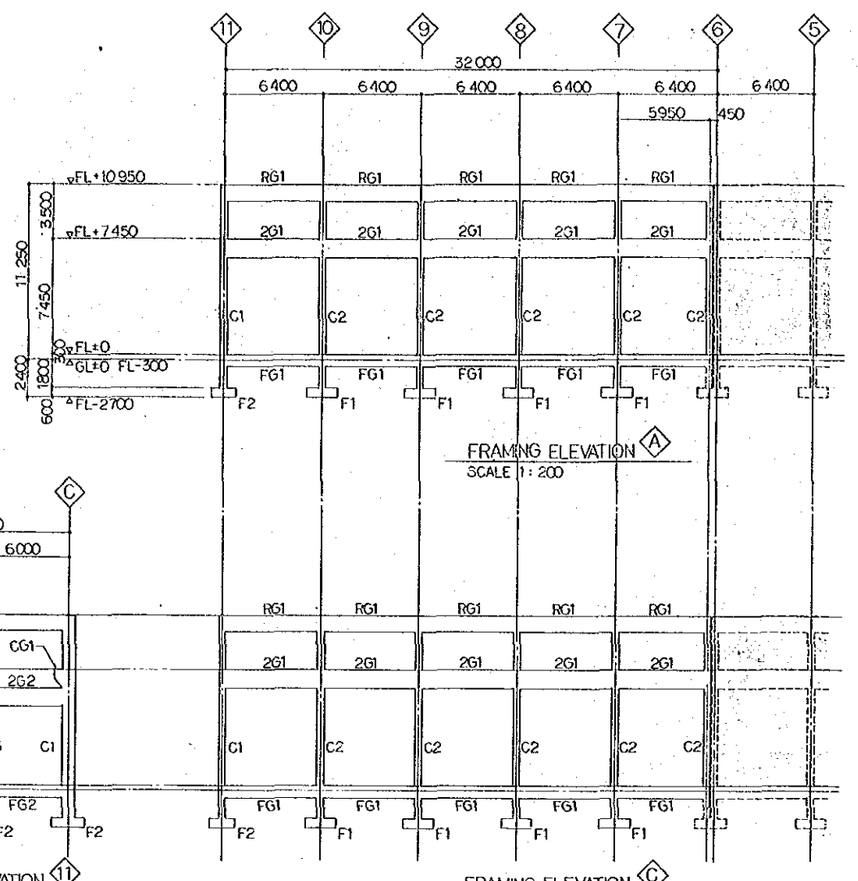


ROOF FRAMING PLAN
SCALE 1 : 200



FRAMING ELEVATION 6 7 8 9 10
SCALE 1 : 200

FRAMING ELEVATION 11
SCALE 1 : 200



FRAMING ELEVATION A
SCALE 1 : 200

FRAMING ELEVATION C
SCALE 1 : 200

GRAPHIC SCALES

0 1 5 10m
SCALE 1 : 200

0 50 100 250cm
: SCALE 1 : 50

COLUMN LIST

MARK	C1	C2	C3
	THROUGH	THROUGH	THROUGH
SECTION	800 / 400	800 / 400	600 / 400
MAIN BAR	14-#8	16-#8	10-#8
HOOP	#30@80	#30@80	#30@100
TIE BAR	#30@600	#30@600	

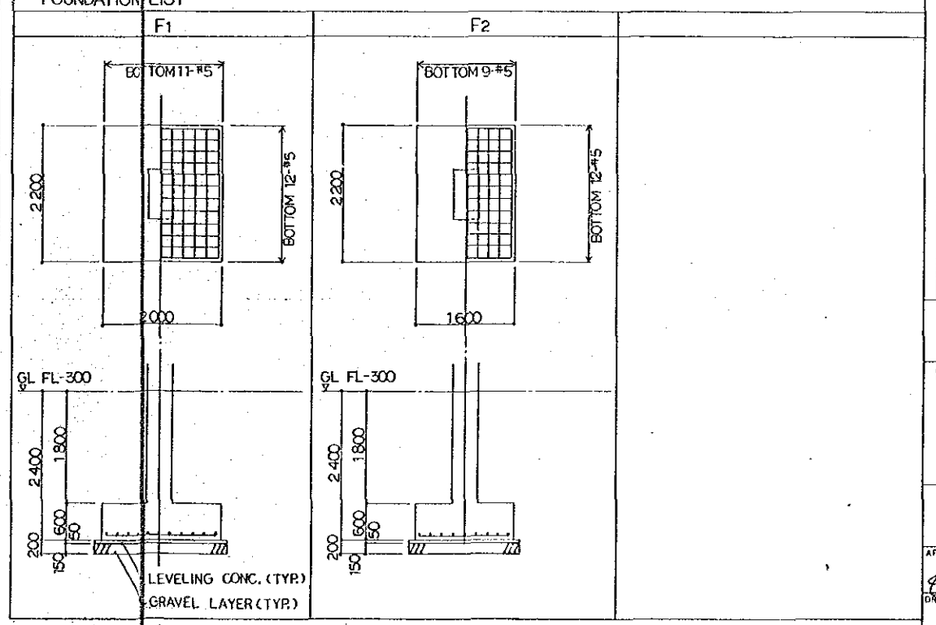
BEAM LIST

MARK	B1	
	END	CENTER
SECTION	600 / 400	600 / 400
TOP	4-#6	3-#6
WEB	2-#3	
BOTTOM	3-#6	4-#6
STIRRUP	□#30@150	

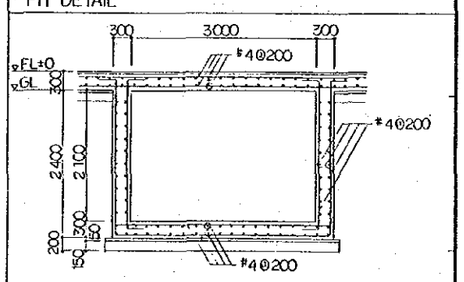
GIRDER LIST

MARK	RG1	RG2		2G1	2G2	CG1	FG1	FG2
	THROUGH	END	CENTER	THROUGH	THROUGH		THROUGH	THROUGH
SECTION	1000 / 400	1000 / 400	1000 / 400	1200 / 250	1200 / 250	600 600 1200	800 / 300	800 / 300
TOP	3-#8	6-#8	6-#8	3-#8	4-#8	3-#6	4-#8	5-#8
WEB	4-#3	4-#3		4-#4	4-#4		2-#3	2-#3
BOTTOM	3-#8	6-#8	8-#8	3-#8	4-#8	3-#6	4-#8	5-#8
STIRRUP	□#30@150	□#30@150		□#30@200	□#30@200	□#30@150	□#30@200	□#30@200

FOUNDATION LIST



PIT DETAIL



PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

GRID STATION BALDIA

STRUCTURAL DRAWING

JAPAN INTERNATIONAL COOPERATION AGENCY

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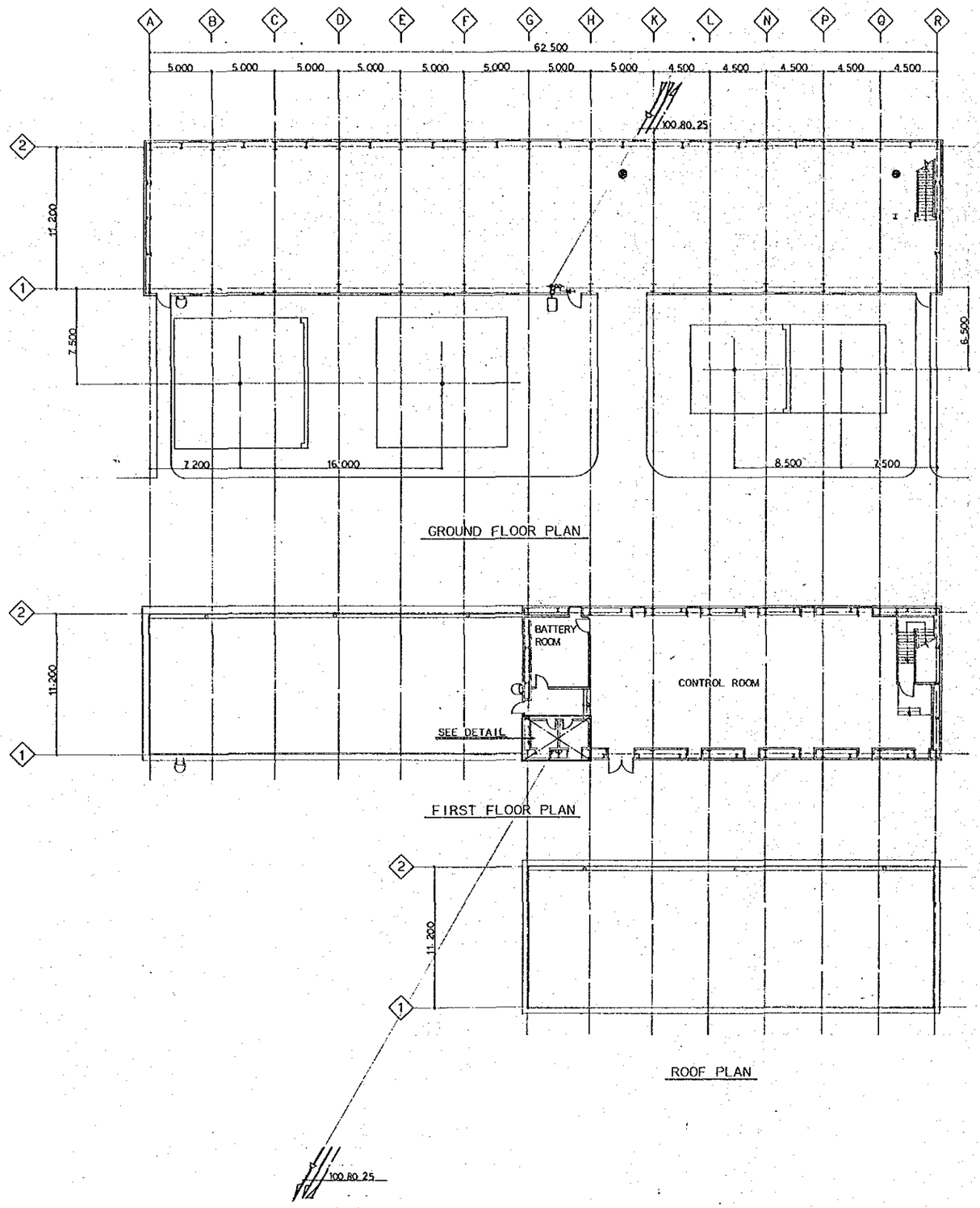
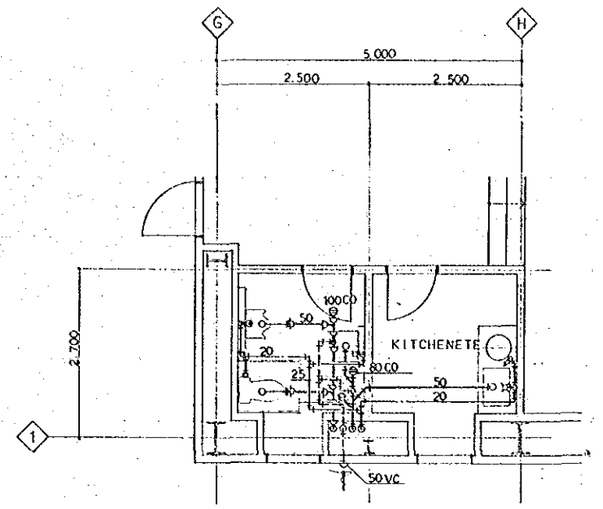


GROUND FLOOR PLAN

FIRST FLOOR PLAN

ROOF PLAN



DETAIL

PLUMBING EQUIPMENT SCHEDULE

NO.	MACHINE NAME	SPECIFICATION	QTY	REMARKS
SEP - 1	SEPTIC TANK	F.R.P MADE CAPACITY: 1.0ton	1	
EH - 1	WATER HEATER	ELECTRIC HEATER PEDESTAL TYPE CAPACITY : 10^{A} ELECTRIC OUTPUT : 1.5 ^{kW} (1$^{\phi}$ 220^{V})	1	

PLUMBING AND SANITARY FIXTURES SCHEDULE

NO.	FIXTURE NAME	SPECIFICATION	ACCESSORIES	QTY	REMARKS
C - 1	WATER CLOSET	VITREOUS CHINA. WAS-DOWN CLOSED COUPLED	LOW TANK W/INSULATING LINER AND HAND WASHING LID. TANK TRIM. SEAT AND COVER	1	
	ROLL PAPER HOLDER	PLASTIC MADE			
U - 1	URINAL	V.C WALL HANG.	INTEGRAL TRAP. FLASH VALVE. INLET SPUD	1	
L - 1	LAVATORY	V.C WALL HANG.	LAVATORY FAUSET. WALL SUPPLY W/STOP POP-UP WASTE W/P TRAP. PEDESTRAL	1	
	LIQUID SOAP HOLDER				
	MILLER				
	WALL FAUCET	SWING SPOUT		1	

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KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

SUBSTATION
PLUMBING
FLOOR PLAN AND EQUIPMENT SCHEDULE

JAPAN INTERNATIONAL COOPERATION AGENCY

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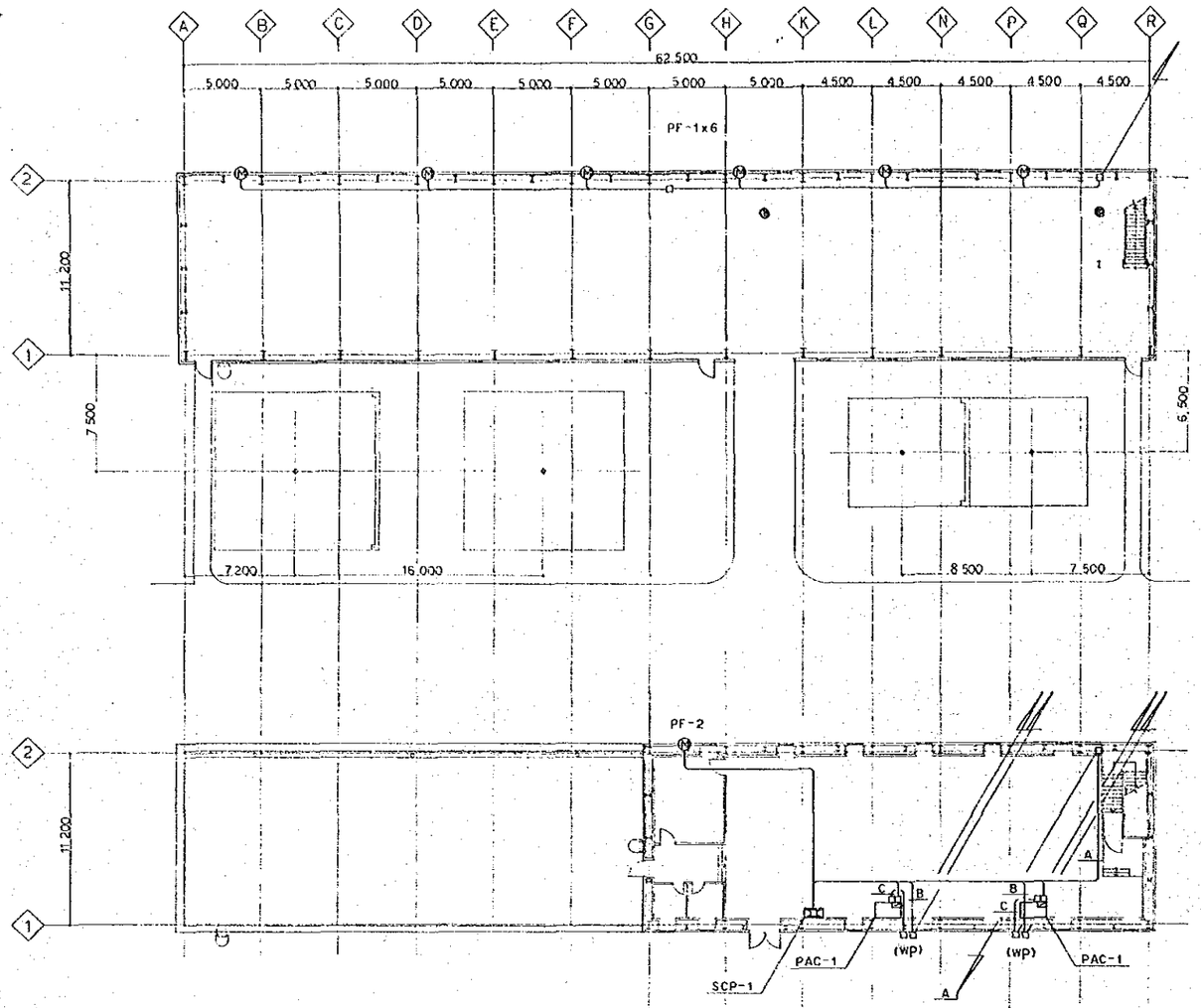
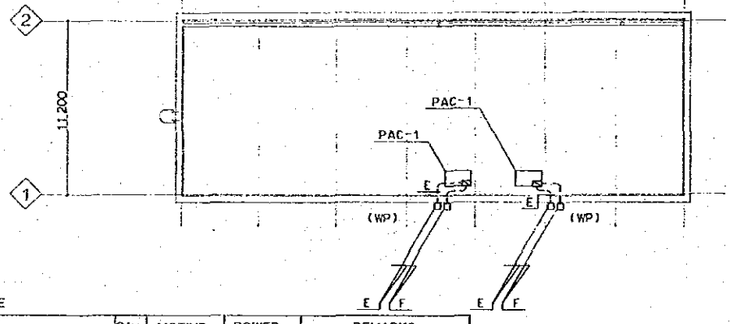
WAT-1618	1:200	DEC 1989



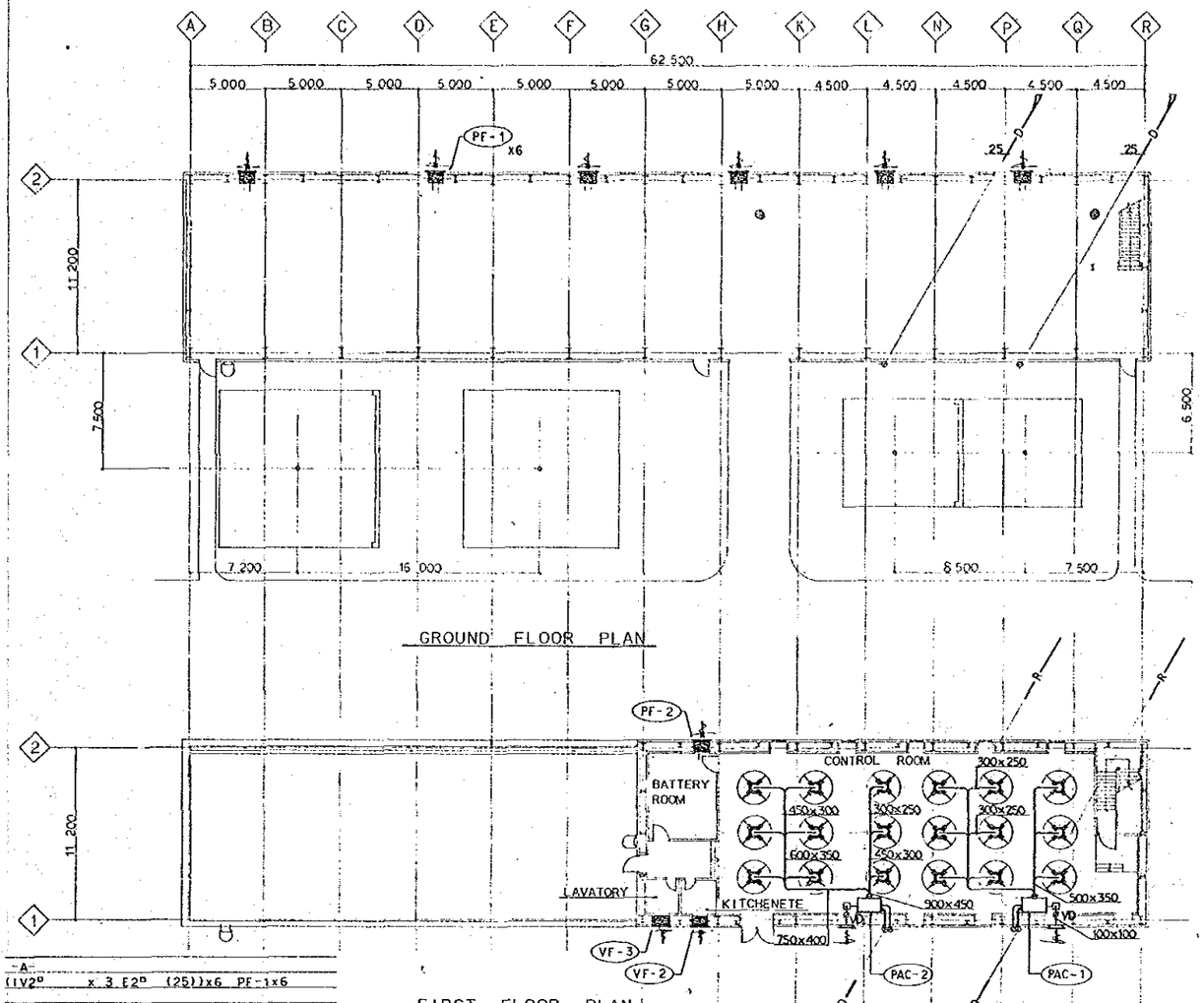


LEGEND

NAME	CAPACITY	WIRING	PIPING
SCP-1	3Φ380V		
PAC-1(I.D.U)	2.2KW	IV2.0	x 3 E2.0 (25)
PAC-1(I.D.U)	2.2KW	IV2.0	x 3 E2.0 (25)
PAC-1(O.D.U)	14.2KW	IV14.0	x 3 E5.5.0(28)
PAC-1(O.D.U)	14.2KW	IV14.0	x 3 E5.5.0(28)
PF-1(x6)	0.75KW	IV2.0	x 3 E2.0 (25)
PF-2	0.05KW	IV2.0	x 3 E2.0 (25)

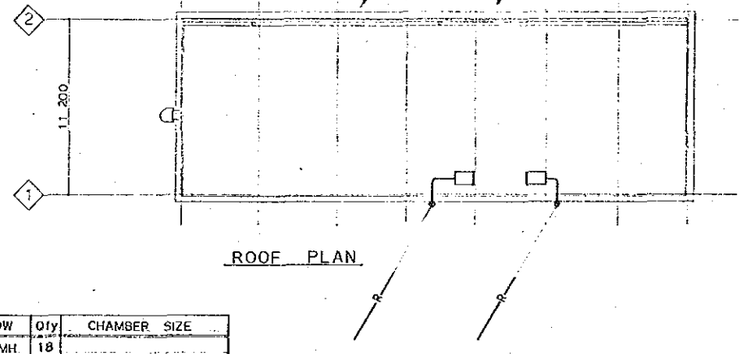
AIR CONDITION AND VENTILATION WORKS EQUIPMENT SCHEDULE

MARK	EQUIPT NAME	DESCRIPTION	Qty	MOTIVE	POWER	REMARKS
PAC-1	PACKAGED	AIR COOLED FLOOR TYPE	2			
	AIR CONDITIONER	COOLING LORD:37200kcal/Hr				
		FAN:AIR FLOW 10500CMH				
		POWER OUTPUT:IN/OUT		3.7kw/0.3kw x 2		
		COMP:		23.2kw		
PF-1	PROPELLER	600φ x 6350CMH x 5mmAq	6	0.75kw	3φ-380v	W/SUS WEATHER COVER
PF-2	do	300φ x 1000CMH x 5mmAq	1	0.05kw	3φ-380v	do
VF-1	do	200φ x 300CMH x 5mmAq	1	18w	1φ-220v	do
VF-2	do	200φ x 200CMH x 5mmAq	1	18w	1φ-220v	do



GROUND FLOOR PLAN

FIRST FLOOR PLAN



ROOF PLAN

-A-
IV2.0 x 3 E2.0 (25)x6 PF-1x6

-B-
IV14.0 x 3 E5.5.0(31) PAC-1(O.D.U)

-C-
IV2.0 x 5 (25) IN DOOR UNIT

-D-
IV14.0 x 3 E5.5.0(28) PAC-1(O.D.U)

-E-
IV2.0 x 5 (22) IN DOOR UNIT

ROOM NAME	TYPE	SIZE	AIR FLOW	Qty	CHAMBER SIZE
CONTROL ROOM	DIFFUSER C-2	30	1167 CMH	18	
	OA GRILLE		250 CMH	2	1,000 x 460

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

SUBSTATION
A/C AND VENTILATION,
SECONDARY WIRING
FLOOR PLAN

JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

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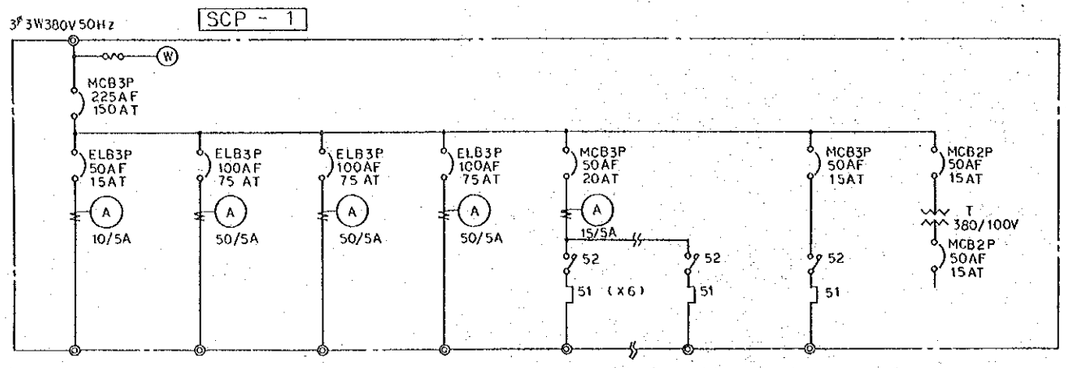
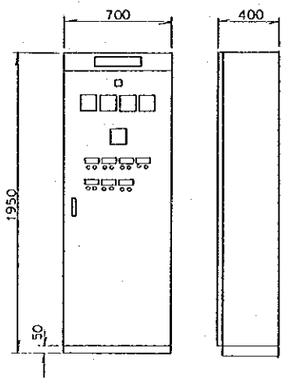
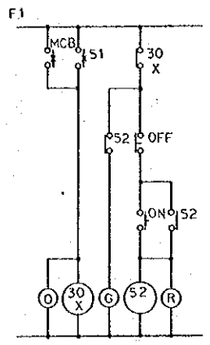
DRAWING NO.	SCALE	DATE
WAT-1619	1:200	DEC 1989



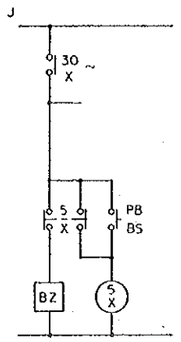
SYMBOL	PAC - 1		PAC - 1		PF - 1	PF - 2	
CAPACITY(KW)	2.2	14.2	2.2	14.2	0.75 x 6	0.05	
CIRCUIT DIAGRAM					F1 (x 6)	F1	J



SCP - 1



RF, EF, OF, PF



BZ ALAM

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

SUBSTATION
A/C AND VENTILATION
SECONDARY WIRING DIAGRAM

JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

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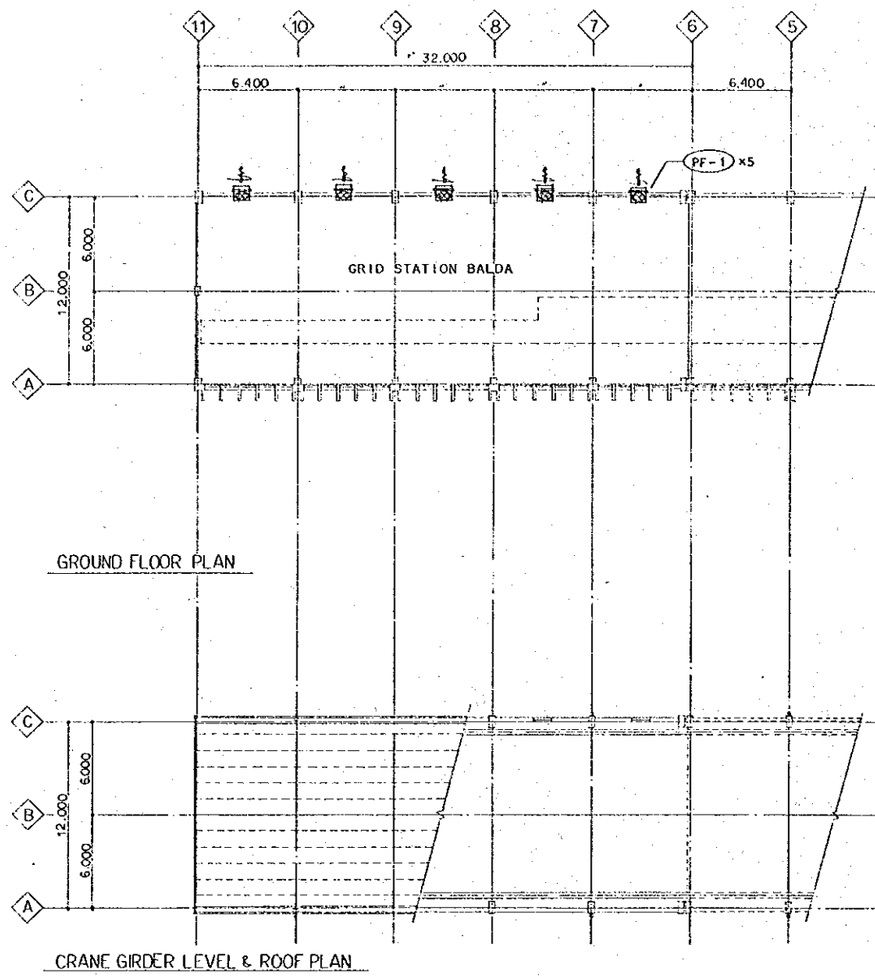
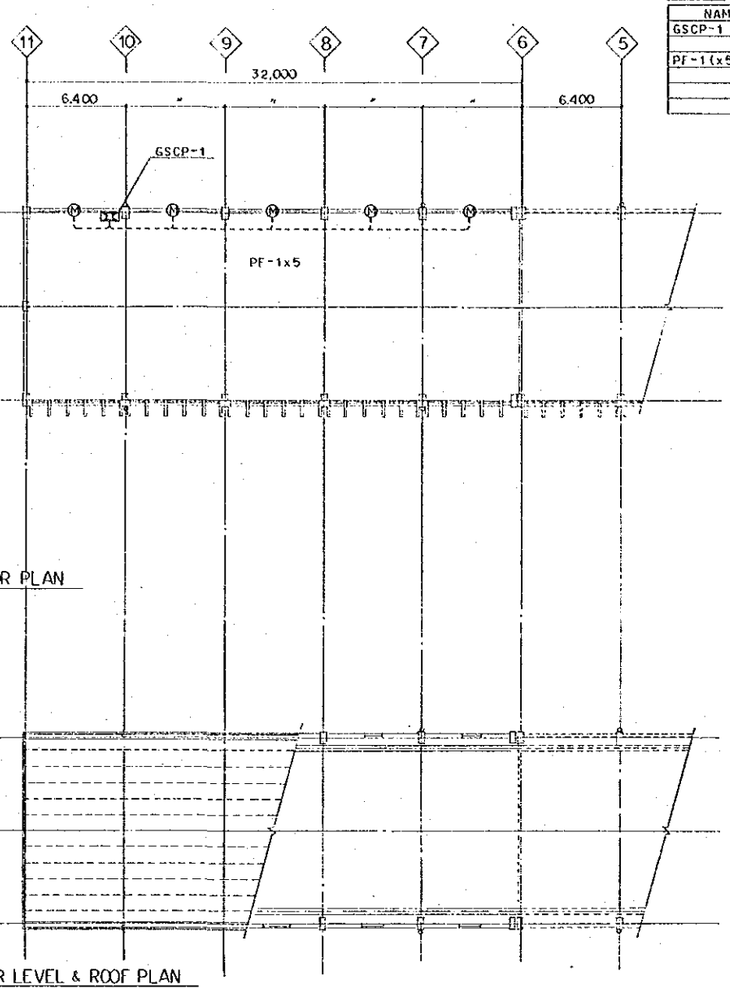
		Jmp	Jmp
DRAWING NO.		SCALE	DATE
WAT-1620		not to scale	DEC 1989



GROUND FLOOR PLAN

CRANE GIRDER LEVEL & ROOF PLAN



GROUND FLOOR PLAN

CRANE GIRDER LEVEL & ROOF PLAN

LEGEND.

NAME	CAPACITY	WIRING	PIPING
GSCP-1	3Φ380V		
PF-1(x5)	0.4KW	1V2Φ x 3 E2Φ (25)	

VENTILATION WORKS EQUIPMENT SCHEDULE

MARK	EQUIPT NAME	DESCRIPTION	Q'ty	POWER	VOLT	REMARKS
PF-1	PROPELLER FAN	φ500. AIR VOLUME: 4.240m³/H SP: 5mmAq	5	0.4kw	3φ-380v	
		W/SUS WEATHER COVER. SHUTTER				

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

GRID STATION BALDA
VENTILATION & SECONDARY WIRING
FLOOR PLAN

JAPAN INTERNATIONAL COOPERATION AGENCY

TOKYO JAPAN

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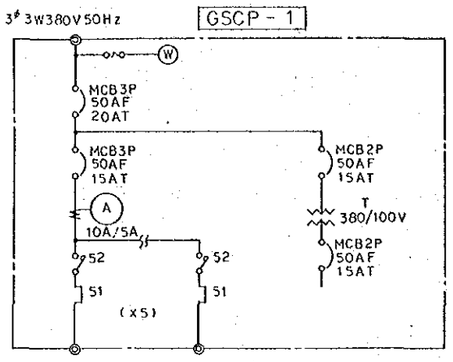
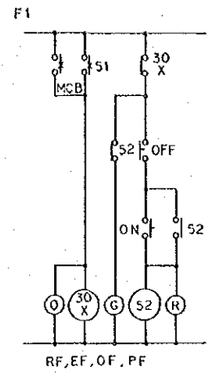
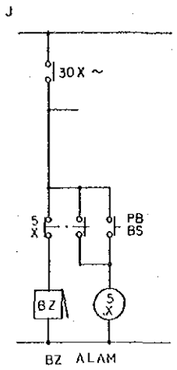
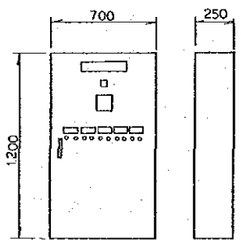
DRAWING NO.		SCALE	DATE
WAT - 1621		1:200	DEC 1989



SYMBOL	PF - 1		
CAPACITY (KW)	0.4 x 5		
CIRCUIT DIAGRAM	F1 (x 5)	J	







GSCP-1

PAKISTAN

KARACHI ELECTRIC SUPPLY CORPORATION

WEST WHARF THERMAL POWER PLANT PROJECT

UNITS NO.1 AND NO.2

GRID STATION BALDA
VENTILATION
SECONDARY WIRING DIAGRAM

JAPAN INTERNATIONAL COOPERATION AGENCY

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