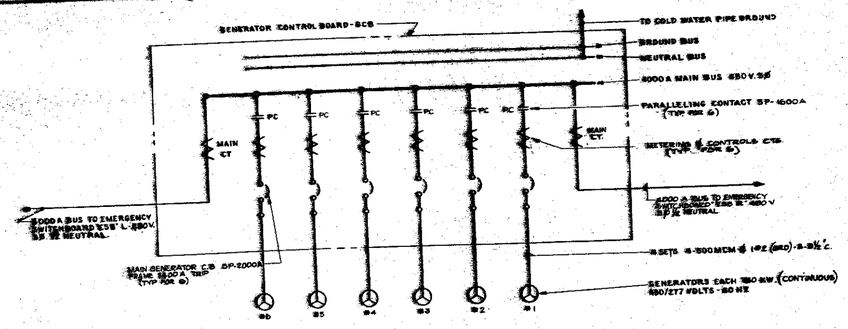


GENERATOR ONE LINE DIAGRAM

SCHEDULE OF ELECTRICALLY OPERATED MECHANICALLY HELD 3Ø 600V. POWER TRANSFER SWITCHES FOR 277/480 V. OPERATION

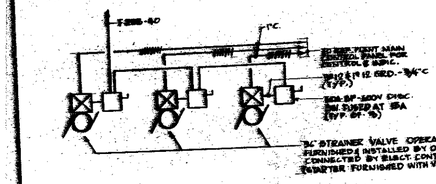
SWITCH DESIGNATION	LOCATION	ENCLOSURE	LINE I & LOAD		LINE II		ACCESSORIES (SEE NOTE #2)	REMARKS
			CAPACITY	FEEDER	CAPACITY	FEEDER		
ATS-S1 & ATS-S2	GEN. ROOM	SEPARATE WALL MOUNTED CABINET	1250A	4"Φ 3/0 & 1"Φ #2 GRD. 2-3½"C.	1250A	4"Φ 3/0 & 1"Φ #2 GRD. 2-3½"C.	81, 82, 83, 1	AUTOMATIC 3 SOURCE ARRANGEMENT
ATS-S3	GEN. ROOM	SEPARATE WALL MOUNTED CABINET	1250A	4"Φ 500MCM & 1"Φ #2 GRD. 2-3½"C.	1250A	4"Φ 500MCM & 1"Φ #2 GRD. 2-3½"C.	81, 82, 83, 84, 1	AUTOMATIC FOR MOTOR OPERATION
ATS-G4	REF. PLANT	SEPARATE WALL MOUNTED CABINET	800A	2"Φ #1/0 & 1"Φ #6 GRD. 1-2"C.	800A	1"Φ #4/0 & 1"Φ #6 GRD. 1-2"C.	83, 86, 85, 84, 1	AUTOMATIC FOR MOTOR OPERATION OF PUMP NO. 2 & OF SUMP PUMP #5
ATS-G5	REF. PLANT	SEPARATE WALL MOUNTED CABINET	800A	1"Φ #4/0 & 1"Φ #6 GRD. 1-2"C.	800A	1"Φ #4/0 & 1"Φ #6 GRD. 1-2"C.	85, 86, 83, 84, 1	AUTOMATIC FOR MOTOR OPERATION OF PUMP NO. 1 OF SUMP PUMP #5

480V. EMERGENCY SWITCHBOARD SCHEDULES 3Ø-½ NEUT.

SWITCHBOARD DESIGNATION	CIRCUIT BREAKER NUMBER	FEEDER DESIGNATION	PROTECTIVE DEVICE RATING AMPS.	POLES	TYPE *	TRIP RATING AMPS.	FEEDER	SERVICE TO	REMARKS
ESB-L	L-1	F-ESB-30	2000	3	C/B	1600	6 SETS OF 3" 500 MCM & 1" #2 GRD. 4-3½"C.	TOWER 'A' ELEVATORS	VIA EPC-41A, EPC-79A, EPC-108A
	L-2	F-ESB-9	800	3	C/B	600	2 SETS OF 3" 250 MCM & 1" #4 GRD. 2-2½"C.	FIRE PUMPS TOWERS 'A' & 'B'	VIA TD-45L & TD-89L
	L-3	F-ESB-24	800	3	C/B	600	2 SETS OF 3" #1/0 & 1" #6 GRD. 2-2½"C.	EMERGENCY DIST. PNL. ESB-D	
	L-4		800	3				SPACE ONLY	FOR TV TRANSMITTER
	L-5	F-ESB-27	800	3	C/B	600	3" #500 MCM & 1" #6 GRD. 3-3½"C.	EMERGENCY DIST. PNL. ESB-E	
	L-6	F-ESB-11	1200	3	C/B	1000	4 SETS OF 3" #500 MCM & 1" #2 GRD. 4-3½"C.	TOWER 'A' LIGHTING & PWR.	VIA EPC-41A, EPC-41B, EPC-79A, EPC-108A
	L-7	F-ESB-28	800	3	C/B	150	3" 4 250 MCM & 1" #6 GRD. 2-3½"C.	EMERGENCY DIST. PNL. ESB-F	
	L-8		800	3	C/B	800		SPARE	
	L-9		1200	3	C/B	800		SPARE	
	L-10		800	3	C/B	800		SPACE	
	L-11		800	3				SPACE ONLY	
	L-12		800	3				SPACE ONLY	
	L-13		800	3				SPACE ONLY	
ESB-R	R-1	F-ESB-7	2000	3	C/B	1600	6 SETS OF 3" 500 MCM & 1" #2 GRD. 4-3½"C.	TOWER 'B' ELEVATORS	VIA EPC-41B, EPC-79B, EPC-108B
	R-2	F-ESB-2	800	3	C/B	600	2 SETS OF 3" 250 MCM & 1" #4 GRD. 2-2½"C.	FIRE PUMPS TOWERS 'A' & 'B'	VIA TD-45R & TD-89R
	R-3	F-ESB-30	800	3	C/B	800	2 SETS OF 3" 500 MCM & 1" #2 GRD. 2-3½"C.	EMERGENCY DIST. PNL. ESB-C	
	R-4	F-ESB-1	1200	3	C/B	800	3 "500 MCM & 1" #2 (GRD.) -3½"C.	SPRINKLER PUMP SWR. 'A'	VIA A-TS-6-LA
	R-5	F-ESB-14	800	3	C/B	1200	6" #1/0 & 1" #6 GRD. -2"C.	TOWER 'B' LIGHTING & PWR.	VIA EPC-79B, EPC-108B
	R-6	F-ESB-15	1200	3	C/B	1000	4 SETS OF 3" #500 MCM & 1" #2 GRD. 4-3½"C.	EMERGENCY DIST. PNL. ESB-B	
	R-7	F-ESB-24	1200	3	C/B	1000	3 SETS OF 3" #500 MCM & 1" #2 GRD. 3-3½"C.	SPARE	
	R-8		800	3	C/B	800		SPARE	
	R-9		800	3	C/B	800		SPARE	
	R-10		800	3	C/B	800		SPACE ONLY	
	R-11		800	3				SPACE ONLY	
	R-12		800	3				SPACE ONLY	
	R-13		800	3				SPACE ONLY	

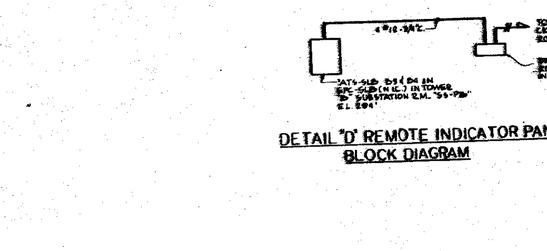
DISTRIBUTION AND POWER PANELBOARD SCHEDULES

PANEL DESIGNATION	CKT. NO.	FEEDER SYMBOL	PROTECTIVE DEVICE RATING AMPS.	POLES	TYPE	TRIP RATING AMPS.	FEEDER	SERVICE TO	REMARKS
ESD-A 480V	1	F-ESB-2	400	3	C/B	250	3" 3/0 & 1" #6 (GRD) -2½"C.	EXHAUST FAN E-55-1 & E-55-2 & E-55-3	FOR EMERGENCY GENERATOR ROOM
	2	F-PMD	225	3	C/B	175	3" 3/0 & 1" #6 (GRD) -2½"C.	RIVER WATER PUMP (WRC'S)	IN PUMP HOUSE-FEEDER (WLC)
	3	F-ESB-31	100	3	C/B	15	3" 12 & 1" #12 (GRD) -¾"C.	FUEL OIL TRANSFER PUMP	¾ H.P.
	4	F-ESB-32	100	3	C/B	15	3" 12 & 1" #12 (GRD) -¾"C.	FUEL OIL TRANSFER PUMP	¾ H.P.
	5	F-ESB-33	100	3	C/B	15	3" 12 & 1" #12 (GRD) -¾"C.	FUEL OIL TRANSFER PUMP	¾ H.P. (STAND BY)
	6	F-ESB-34	100	3	C/B	15	3" 12 & 1" #12 (GRD) -¾"C.	OVERFLOW & OIL DRAIN TRANSFER	¾ H.P.
	7	F-ESB-35	400	3	C/B	150	3" 10 & 1" #12 (GRD) -¾"C.	SWEET WATER CIR. PUMP	15 H.P.
	8	F-ESB-36	400	3	C/B	150	3" 10 & 1" #12 (GRD) -¾"C.	SWEET WATER CIR. PUMP	15 H.P. (STAND BY)
	9	F-ESB-40	400	3	C/B	150	3" 10 & 1" #12 (GRD) -¾"C.	MOTORIZED STRAINER VALVES	3@ 5-6 RUNNING AMPS.
	10		100	3	C/B	100		SPARE	
ESD-B 480V	1	F-ESB-8	400	3	C/B	400	3-500 MCM & 1" #2 GRD. -3½"C.	NW PLAZA LTG. & ELEVATORS	VIA EPC-41E
	2	F-ESB-9	800	3	C/B	800	2" 4" E.C.	HOTEL LTG. & ELEVATORS	VIA EPC-41E (TO BE COMPLETED)
	3	F-ESB-12	400	3	C/B	300	3-500 MCM & 1" #2 GRD. -3½"C.	CUSTOMS LTG. & ELEVATORS	VIA EPC-81C
	4	F-ESB-21	400	3	C/B	400	3½"C.	SB PLAZA LTG. & ELEVATORS	VIA EPC-79D (TO BE COMPLETED)
	5		225	3	C/B	225		SPARE	
	6		225	3	C/B	225		SPARE	
ESD-C 480V	1	F-ESB-20	225	3	C/B	200	3" 3/0 & 1" #6 (GRD) -2½"C.	CONFLUENCE PLANT LTG. & PWR. (SUB)	VIA RTS-82 & 82
	2	F-ESB-19	800	3	C/B	600	6 SETS OF 3" 250 MCM & 1" #4 GRD. -3-2½"C.	SUB-GRADE TUNNEL "A" LTG. & ELEVATORS	VIA EPC-81A
	3	F-ESB-5	800	3	C/B	600	2 SETS OF 3" 250 MCM & 1" #4 GRD. -2-2½"C.	SUB-GRADE TUNNEL "B" & ELEVATORS	VIA EPC-81B
	4		100	3	C/B	60		FUTURE WATER APPARATUS	TO BE COMPLETED
	5		225	3	C/B	225		SPARE	
	6		400	3	C/B	600		SPARE	
ESD-D 480V	1		100	3	C/B	100		SPARE	
	2		225	3	C/B	200		SPARE	
	3		100	3	C/B	100		SPARE	
	4		100	3	C/B	100		SPARE	
	5		100	3	C/B	100		SPARE	
	7		225	3	C/B	225		SPARE	
	8		400	3	C/B	100		SPARE	
	9		225	3	C/B	225		SPARE	
ESD-E 480V	1	F-ESB-17	100	3	C/B	70	3" 4 #12 (GRD) -1"C.	EXHAUST FAN E-55-12	PATH STAIR VENT. NORTH PROJECTION
	2	F-ESB-18	100	3	C/B	70	3" 4 #12 (GRD) -1"C.	EXHAUST FAN E-52-50	PATH STAIR VENT. SOUTH PROJECTION
	3	F-ESB-16	800	3	C/B	400	3" 3/0 & 1" #6 (GRD) -2"C.	SUMP PUMP #6, WCS-35-5, WCR-55-5	
	4	F-ESB-13	225	3	C/B	125	3" 4 & 1" #10 (GRD) -1½"C.	SEWAGE EJECTOR #3	
	5		225	3	C/B	225		SPARE	
	6	F-ESB-37	100	3	C/B	60	3-4 & 1" #12 (GRD) -1½"C.	PUMP #2 OF SUMP PUMP #5	VIA ATS-S4
ESD-F 480V	1	F-ESB-10	100	3	C/B	80	3" 4 & 1" #12 (GRD) -1"C.	NO. 4 MAINS W/PH-55-51 & 52	TO SUPERVISOR ROOM
	2	F-ESB-26	100	3	C/B	80	3" 4 & 1" #12 (GRD) -1"C.	ALARM PANELS	ON SECURITY ROOM (TO BE COMPLETED)
	3	F-ESB-29	225	3	C/B	150	3" #1/0 & 1" #6 (GRD) -2"C.	ESP-G, ON GENERATOR ROOM	VIA 480 KVA. TRANSFORMER 1
	4		225	3	C/B	225		SPARE	
DPG-A 480V	1	F-DPG-A-1	225	3	C/B	150	3" 4/0 & 1" #6 (GRD) -2"C.	EMERG. DIST. PNL. ESB-F	VIA RTS-S4 & S5
	2	F-DPG-A-2	800	3	C/B	600	3-300 MCM & 1" #2 GRD. -3½"C.	EMERG. DIST. PNL. ESB-R	VIA RTS-S3
	3		225	3	C/B	225		SPARE	

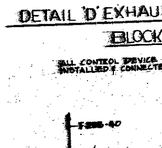


DETAIL 'A'

ENGINE GAUGE BOARD



- (A) - ALARM HORN
- (AS) - ALARM SILENCER
- (F) - FREQUENCY METER
- (GA) - GEN. AMMETER
- (GV) - GEN. VOLTMETER
- (AS) - AMMETER SWITCH
- (VS) - VOLTMETER SWITCH
- (W) - WATT VARMETER
- (S) - SYNCHROSCOPE
- (MS) - MODE SWITCH
- (SS) - SYNCHROSCOPE PLANT SELECTOR
- (UR) - UNIT RUNNING
- (UI) - UNIT IDLE
- (UL) - UNIT LOCKOUT
- (MB) - MAIN CIRCUIT BREAKER
- (DS) - DROOP SETTING
- (RT) - RUNNING TIME METER
- (VS) - VOLTAGE SETTING
- (GA) - GEN. AMMETER
- (F) - FREQUENCY METER
- (GV) - GEN. VOLTMETER
- (AS) - AMMETER SWITCH
- (GS) - GOVERNOR SETTING
- (VS) - VOLTMETER SWITCH
- (AS) - AUTO ENGINE START CONTROL (SEE DETAIL 'B')



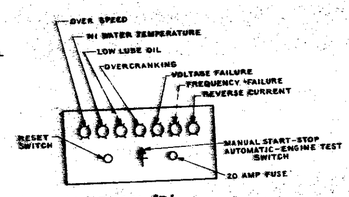
DETAIL 'D' EXHAUST FANS CONTROL WIRING BLOCK DIAGRAM

ALL CONTROL DEVICES SHALL BE FURNISHED BY OTHERS INSTALLED & CONNECTED BY ELECT. CONTRACTOR.

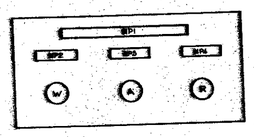
DETAIL 'E' STRAINER VALVE OPERATORS

LEGEND FOR DETAIL 'D'

- EP—ELECTRO PNEUMATIC SOLENOID
- FT—FIRESTAT
- LO—LOCKOUT PUSH BUTTON
- PE—PNEUMATIC ELECTRIC SWITCH
- R1—CONTROL RELAY
- R2—CONTROL RELAY ON EMERGENCY SWBD.



DETAIL 'B'



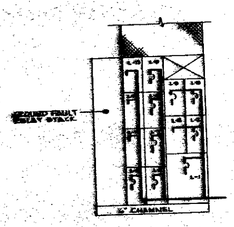
DETAIL 'C' SECURITY ROOM LTG. REMOTE INDICATOR PANEL

N.I.S.

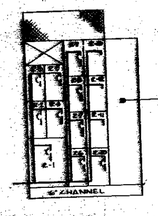
SEE NOTES 4 & 5

NPI: SECURITY ROOM LIGHTING SUPPLY
NPS: ON SECOND NORMAL FEEDER
NP3: EMERGENCY GENERATOR REQUIRED
NP4: ON EMERGENCY FEEDER

DETAIL 'D' REMOTE INDICATOR PANEL BLOCK DIAGRAM



EMERGENCY SWITCHBOARD 'ESB-L'
SCALE 3/8" = 1'-0"



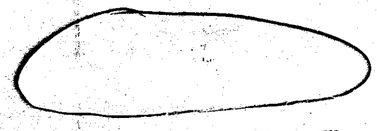
EMERGENCY SWITCHBOARD 'ESB-R'
SCALE 3/8" = 1'-0"

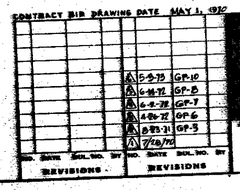
NOTES:

1. FOR LIST OF DRAWINGS, SYMBOL LIST AND GENERAL NOTES SEE DRAWING # E-0-1
2. FOR DESCRIPTION OF ACCESSORIES AND OPERATING OF TRANSFER SWITCHES SEE SPECIFICATIONS.
3. FOR EMERGENCY LIGHT AND POWER RISER DIAGRAM SEE DRAWING # E-6-2
4. PROVIDE AUXILIARY CONTACT IN "ATS-S1B4" FOR REMOTE INDICATION OF TRANSFER SWITCH OPERATION.
5. PROVIDE AUXILIARY CONTACTS IN "ATS-S1B4" FOR REMOTE INDICATION OF BOTH TRANSFER SWITCH OPERATION AND SIGNAL START.
6. 4 EPS & 3 SA N.O. AUX CONTACTS ON AUTO TRANSFER SW. ATS G1&G2. CONTACTS SHALL CLOSE WHEN TRANSFER SWITCH IS IN EMERG. POSITIONS ONLY.

EMERGENCY LIGHTING PANELBOARD SCHEDULES

PANEL DESIGNATION	DESIGN LOAD KW.	DESIGN LOAD AMPS.	MAINS CAPACITY AMPS.	MAINS BREAKER FRAME AMPS.	MAINS TRIP AMPS.	MAINS NO. OF POLES	BRANCHES BRANCH CIRCUIT NUMBERS	BRANCHES EMERGENCY FRAME AMPS.	BRANCHES EMERGENCY TRIP SETTING AMPS.	BRANCHES NO. OF POLES	SERVICE TO	REMARKS
ERP-B 120/208V.			225				4-8	50	15	1	GENERATOR RM. LTG. & RECEPTS.	
							9,11,13,15,17,19,21	50	15	1	BATTERY CHARGES	
							10,12,14,16,18,20,22	50	15	1	GOVERNORS	½ HP. EACH
							23,25	50	15	1	GEN CONTROL BD.	
							24	50	15	1	ELEC. OPERATE BRKS	IN "ESB"
							26-32	50	15	1	CRANK CASE HEATERS WATER HEATER ALARM FOR SUMP PUMP #6	
							33	50	15	1		
							46	100	30	2	CP-185-B1	DUPLEX PUMP 2.8 HP. H.P.
							48	50	15	1	EP-B1C CONTROL PWR. CONT. RELAY EXH. FAN E-55-51A	
SURFACE MOUNTED							50-54	50	15	1	SPARES	
			400				56-58	50	50	1	SPARES	
ERP-FAC 120/208V IN AMPLIFIER ROOM							60-62	50	50	1	SPARES	
								50	50	1	SPARE	
SURFACE MOUNTED												





THE WORLD TRADE CENTER

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PAVING, UTILITIES, FOUNDATIONS

LIGHTING PANEL, MAIN AND DISTRIBUTION SWITCHBOARD SCHEDULES AND DETAILS

DRAWN: R.F.H. | CHECKED: | JOB NO. 184
SCALE: AS NOTED | DATE: MAY 1, 1970
SUBMITTED: SCE.B.P. | SHEET NO. OF
APPROVED: E-6