



Kingdom of Bahrain
Electricity & Water Authority (EWA)

Auction No.: PT/CSD/2023/BK01

**AUCTION FOR PURCHASE, DECONSTRUCTION, DISMANTLING,
DEMOLITION & REMOVAL OF SITRA POWER & WATER STATION
AND PURCHASE OF THE STATION SPARE PARTS**

SECTION - 3

List of Station Plants, Machineries & Equipment

**Project Title: AUCTION FOR PURCHASE, DECONSTRUCTION, DISMANTLING, DEMOLITION & REMOVAL OF SPWS
AND PURCHASE OF THE STATION STORED SPARES**

**SECTION – 3, List of Station Plants, Machineries & Equipment
Table of Contents**

The Station Plants & Major Equipment	7
1. Phase-I Boiler 1, 2, 3 & 4.....	14
1.1 Boilers 1 to 4 Mechanical Parts:	15
1.2 Boilers 1 to 4 Electrical Parts:	17
1.3 Boilers 1 to 4 Instrumentation Parts:	17
2. Phase-II Auxiliary Boiler.....	19
2.1. Phase-II Auxiliary Boiler - Mechanical Parts:	20
2.2. Phase-II Auxiliary Boiler - Electrical Parts:	21
2.3. Phase-II Auxiliary Boiler - Instrumentation Parts:	22
3. Phase-II Heat Recovery Boiler	24
3.1. Phase-II Heat Recovery Boiler - Mechanical Parts:	25
3.2. Phase-II Heat Recovery Boiler - Electrical Parts:	26
4. Phase-I Distiller 1A/1B.....	28
4.1. Phase-I Distiller 1A & 1B - Mechanical Parts:	29
4.2. Phase-I Distiller 1A & 1B - Electrical Parts:	35
4.3. Phase-I Distiller 1A & 1B - Instrumentation Parts:	36
5. Phase-III Distiller 2, 3 & 4	37
5.1. Phase-III Distiller 2, 3 & 4 - Mechanical Parts:.....	38
Phase-III Distiller 2, 3 & 4 - Mechanical Spare Parts:.....	46
5.2. Phase-III Distiller 2, 3 & 4 - Electrical Parts:	47
5.3. Phase-III Distiller 2, 3 & 4 - Instrumentation Parts:.....	49
6. Phase-II Distiller 5.....	51

6.1. Phase-II Distiller 5 - Mechanical Parts:	52
Phase-II Distiller 5 – Mechanical Main Spare Parts:	55
6.2. Phase-II Distiller 5 - Electrical Parts:	56
6.3. Phase-I Distiller 5 - Instrumentation Parts:	58
7. Phase-I Steam Turbines	61
7.1. Phase-I Steam Turbines - Mechanical Parts:	62
Phase-I Steam Turbines – Mechanical Main Spare Parts:	64
7.2. Phase-I Steam Turbines - Electrical Parts:	66
7.3. Phase-I Steam Turbines - Instrumentation Parts:	68
8. Phase-II Gas Turbine GT-5	70
8.1. Phase-II Gas Turbine - Mechanical Parts:	71
Phase-II Gas Turbine – Mechanical Main Spare Parts:	74
Phase-II Gas Turbine – special Tools	75
8.2. Phase-II Gas Turbine - Electrical Parts:	81
8.3. Phase-II Gas Turbine - Instrumentation Parts:	84
9. Phase-I Gas Reducing Station GRS#1 & Condensate Handling System	85
9.1 Phase-I Gas Reducing Station GRS#1- Mechanical Parts:	86
9.2 Phase-I Gas Reducing Station GRS#1- Electrical Parts:	87
9.3 Phase-I Gas Reducing Station GRS#1- Instrumentation Parts:	87
10. Phase-II Gas Reducing Station GRS#2	89
10.1. Phase II - Gas Reducing Station GRS#2 - Mechanical Parts:	90
10.3. Phase – II Gas Reducing Station GRS#2 - Instrumentation Parts:	91
11. Phase-I, II & III Demin Plants	92
11.1. Phase-I, II & III Demin Plants- Mechanical Parts	93
11.2. Phase-I, II & III Demin Plants- Electrical Parts:	97
11.3. Phase-I, II & III Demin Plants- Instrumentation Parts:	97
12. Phase – I, II & III Distillate Storage Tanks (Break Tank 1 & 2)	99

13.Phase-I, II & III Sea Water Intakes	101
13.1. Phase- I, II & III Seawater Intakes - Mechanical Parts:	102
13.2. Phase- I, II & III Seawater Intakes - Electrical Parts:	104
13.3. Phase- I, II & III Seawater Intakes - Instrumentation Parts:	105
14.Station Transformers	106
15.Electrical Cables	114
16.Station Electrical Boards	171
17.Phase-I, II & III Seachlore Plants	176
17.1. Phase-I, II & III Seachlore Plants - Mechanical Parts:	177
Phase I - Seachlore Plant	177
Phase II - Seachlore Plant.....	177
17.2. Phase-I, II & III Seachlore Plants – Electrical Parts:	179
17.3. Phase-I, II & III Seachlore Plants - Instrumentation Parts:	179
18.Plant Cranes	181
18.1. Phase – I Cranes	182
18.2. PHASE - II Cranes.....	182
18.3. PHASE - III Cranes	183
19.Control System	184
19.1 Phase-I Steam turbines, Boilers and Distiller 1A & 1B (Distributed Control System ABB Procontrol 14).....	185
19.2 Phase-III Distiller 2, 3 and 4 (PLC System SIMATIC S7 integrated with Foxboroc SPEC-200 Control System)	186
19.3 Phase-II Unit-5 Bailey Controls 7000 Series Electronic Control System	188
19.4 Phase-II Gas Turbine Generating Unit Type 9 Brown, Boveri (BBC).....	188
19.5 Phase-II Gas Turbine #5 Air Intake System Allen Bradley Micrologix 1400 PLC.....	188
19.6 Phase-I Demin Plant PLC System, Siemens S7-1500	188
19.7 Phase-II Demin Plant PLC System, Siemens PLC-S7-200	189
20.Diesel Engines	190
20.1. Emergency Diesel Engine	191




20.2. Fire Emergency Pump	192
21.Common Plants	193
21.1 Common Plants- Mechanical Parts:	194
HP/LP Steam Headers.....	194
Feed & Distillate Headers	198
Condensate Headers	201
Walk-way Bridges.....	201
21.2 Common Plants- Electrical Parts:	202
HP/LP Steam Headers.....	202
21.3 Common Plants- Instrumentation Parts:.....	202
Service Sea Water System	202
Bearing Cooling Water System.....	202
Compressed Air System.....	202
HP Live Steam Header.....	203
R.F.W. System	203
Water Integrator	203
HP/LP Steam Reducing Station	203
HP Dosing System	203
LP Dosing System.....	203

**Electricity & Water Authority (EWA)
Sitra Power & Water Station (SPWS)
The Station Plants, Machineries & Equipment**



- **Electricity Generation: 125 MW**
- **Water Production: 25 MGD**
- **Phase-I: Gas Reducing Station (GRS#1) Steam Generation Plant (Boiler#1,2, 3 & 4), Steam Turbines (T/A1, T/A2, T/A 3, T/A4) & Distiller 1A & 1B**
- **Phase-II: Gas Reducing Station (GRS#2), Gas Turbine (GT-5), Heat Recovery Boiler (HRB), Auxiliary Boiler & Distiller 5.**
- **Phase-III, Distiller 2, 3 & 4**

The Station Plants & Major Equipment

No	Phase & Main Plant	Photo	Q	Design Parameters
1	Phase I Boilers 1, 2, 3 & 4 Page 13 – 17	 A photograph showing four large industrial boilers with tall chimneys, situated in an outdoor industrial area. The boilers are arranged in a row, and the chimneys are prominent against the sky.	4	<ul style="list-style-type: none"> ▪ Manufacturer: Wagner Biro A.G. ▪ Boiler capacity: 204 tones /hr. Super heater steam pressure: 43.1 brag at temp.: 463 °c ▪ Type: Single Drum Natural Circulation ▪ Numbers Installed: Four Boilers Installation Boiler No. 1,2: 1975 ▪ Installation Boiler No. 3,4: 1977
2	Phase II Aux. Boiler Page 18 - 22	 A photograph of a large industrial boiler with a complex network of pipes and a tall chimney stack. The boiler is situated in an outdoor industrial setting.	1	<ul style="list-style-type: none"> ▪ Manufacturer: MACCHI MILAN, ITALY ▪ Steam Production at MCR: 165 T/H ▪ Design Pressure: 20 brag ▪ Steam Conditions at super heater outlet: 14 bar g and 220°C
3	Phase II Heat Recovery Boiler Page 23 - 26	 A photograph of a large industrial boiler with a complex network of pipes and a tall chimney stack. The boiler is situated in an outdoor industrial setting.	1	<ul style="list-style-type: none"> ▪ Manufacturer: MACCHI MILAN, ITALY ▪ Steam Production at MCR: 80 T/H ▪ Design Pressure: 20 brag ▪ Steam Conditions at super heater outlet: 14 bar g and 215°C ▪ Fuel Gas Temp. at Boiler outlet: 196°C ▪ Fuel Gas Flow at Boiler inlet: 472.537 Kg/hr.

4

**Phase I Distiller
1A/1B
Page 27 – 35**



2

- Manufacturer: SOCIETA ITALIANA RESINE, ITALY
- No. OF UNITS: 2
- OUTPUT: 2.5 MGPD
- No. of Stages: 15 Stages (3 Heat Rejection Stages & 12 Heat Recovery Stages)
- Type: MSF

5

**Phase III
Distiller 2, 3 & 4
Page 36 – 50**



3

- Manufacturer: ITALIMPIANTI, GENOVA
- No. OF UNITS: 3
- OUTPUT: 5 MGPD , at TBT 90°C
6.1 MGPD , at TBT 110
- No. of Stages: 21
- Type: MSF

6

**Phase II Distiller 5
Page 51 – 59**



1

- Manufacturer: ITALIMPIANTI, GENOVA
- No. OF UNITS: 1
- OUTPUT: 5 MGPD, at TBT 90°C
- No. of Stages: 16
- Type: MSF

7

**Phase-I Steam
Turbines
Page 60 – 70**



4

- Manufacturer: Franco Tosi – Italy
- Turbine Type: W.R.I- 16, Serial No.: 5363 / 1974
- Capacity: 30 MW, Rated Speed: 3000 RPM
- Over Speed: 3300 RPM,
- Steam Inlet Pressure: 42 bars
- Steam Inlet Temperature: 455°C
- Steam Exhaust Pressure: 0.101 (abs)
- Automat Extraction Pressure: 2.4 bar
- No. of Units: 4

8

**Phase II Gas Turbine
GT5
Page 71 – 85**



1

- Gas Turbine Fram 9D
- Manufacturer: ABB-Ansaldo
- Capacity: 30 MW
- Rated Generator Speed: 3000 RPM
- Turbine Speed: 9000 RPM

9

**Phase-I Gas Reducing
Station GRS#1 &
Condensate Handling
System
Page 86 - 88**



1

- Inlet Gas Pressure: 65 Bars
- Outlet Gas Pressure: 4 Bars
- Consists of 2scrabbers, 2knock outputs,2 swinny filters, 2 primary bath heaters & 3 secondary bath heaters

10

**Phase-II Gas Reducing
Station GRS#2
Page 89 – 91**



1

- Inlet Gas Pressure: 65 Bars
- Outlet Gas Pressure: 4 Bars
- Consists of 2scrabbers, 2knock outputs, 2 swinny filters and 2 bath heaters

11

**Phase-I, II & III Demin
Plants
Page 92 – 98**



2

- Consists of 3 Mixed Bed, Tanks

12

**Distillate Storage
Tanks (Break Tank 1
& 2)
Page 99 – 100**



2

- Each tank capacity is around 3050 m³
- Tank diameter is 18 m, and 12 m height.
- Made of mild steel.

13

**Ph. I, II, III Sea Water
Intakes
Page 101 – 105**



2

- Phase I sea water intake consists of two Rotating Screens with their reduction gears as well as screen wash pumps.
- Phase II sea water intake consists if one Rotary Chain Type Screen as well as a travelling bridge along with their reduction gears as well as screen wash pumps.

14

**Station Transformers
Page 106 – 113**



36

- Manufacturers: Italtrafo, EMCO, O.E.L, G.E.C, Saicem, BBC, OCREV, PIVI & Voltamp.
- Capacity: Varies from 37.5 MVA to 0.187 MVA
- Voltages: 66KV, 11KV, 3.3KV and 415 V
- Oil Types: Mineral oil & Silicone oil

15

**Electrical Cables
(ALL Plants)
Page 114 – 170**



1780

- Power cables used for various applications and voltages in SPWS

16

**Station Electrical
Boards (ALL Plants)
Page 171 – 175**



78

- Manufacturers: ESI MILANO, EMQ, CGE, BBC, ABB
- Capacity: Varies
- Voltages: 11KV, 3.3KV and 415 Vac.

17

**Phase– I, II & III
Seachlore Plant
Page 176 – 180**



2

- There are two Hypo-Chlorination plants

18

**Plants Cranes
Page 181 – 183**



35

- Manufacturers: Carruthers, Prim Sesto, Morris, Chisholm Moore, Pupinto Treviso.
- Capacity: Max 45 Ton and Min 0.25 Ton
Total Cranes in SPWS: 35 No.

19

Control Systems Page 184 – 189



- Distributed Control System ABB Procontrol 14
- Foxboroc SPEC-200 control system PLC System SIMATIC S7
- Bailey Controls 7000 Series Electronic Control System
- Secontic Control System, TR76 Temperature Control, Electrical Excitation, Generator Protection, Static Frequency Converter (SFC) and Hydraulic System on Gas Turbine Generating Unit Type 9 Brown, Boveri (BBC)
- Allen Bradley Micrologix 1400 PLC
- PLC System, Siemens S7-1500/ PLC-S7-200

20

Diesel Engines Page 190 – 192



- Emergency Diesel Generator
- Diesel Fire Pump

21

Common Plants Page 193 – 203



- HP/LP Steam Headers
- Feed & Distillate Headers
- Condensate Headers

22

**66 KV Switch
House &
Transmission
Tower**



23

**Sitra Local
Substation**



1. Phase-I Boiler 1, 2, 3 & 4



- **Manufacturer: Wagner Biro A.G.**
- **Boiler capacity: 204 tones /hr. Super heater steam pressure: 43.1 brag at temp.: 463 °c**
- **Type: Single Drum Natural Circulation**
- **Numbers Installed: Four Boilers**
- **Installation Boiler No. 1,2: 1975**
- **Installation Boiler No. 3,4: 1977**

1.1 Boilers 1 to 4 Mechanical Parts:

No	Item/Equipment / Classification	photo/ Drawing	Q	Description	Major Material
1.1.1	Furnace tubes		4	Outside Diameter: 70 mm Tube Thickness: 4/5.6 mm Combustion chamber rear wall: Tube Material: St 35.8/II Tube Outside Diameter: 60.3 mm Tube Thickness: 4 mm	Steel
1.1.2	Economizer - I		4	Tube Material: St 35.8/II Tube Outside Diameter: 31.8 mm Tube Thickness: 3.2 mm	Steel
1.1.3	Economizer - II		4	Tube Material: St 35.8/II Tube Outside Diameter: 31.8 mm Tube Thickness: 3.2 mm	Steel
1.1.4	Super heater - I		4	Super heater I-Tubes: Type: Coiled Tubes, Tube Material: St 35.8/II Tube Outside Diameter: 38 mm Tube Thickness: 3.6 mm Super heater I- headers: Number Per Boiler: 2 headers (Inlet & outlet), Material: 13 CrMo44, Internal Diameter: 145.8 mm, Thickness: 16 mm	Steel
1.1.5	Super heater - II		4	Super heater II-Tubes: Type: Coiled Tubes, Horizontal Tube Material: 13 CrMo44 Tube Outside Diameter: 38 mm Tube Thickness: 3.6 mm Super heater II- headers: Number Per Boiler: 2 headers (Inlet & outlet), Material: 13 CrMo44, Internal Diameter: 145.8 mm Tube, Thickness: 16	Steel
1.1.6	Super heater suspension tubes		4	Tube Outside Diameter: 44.5 mm Tube Thickness: 4 mm Tube Material: St 35.8/II	Steel
1.1.7	Steam / Water separators		4	Type: Cyclones, Number Installed: 10 Size: 250 mm	Steel
1.1.8	Attemperator		4	Number Installed: 1 Type: Spray Type	Steel
1.1.9	Safety Valves		12	Drum Safety Valves , 2 valves Installed Per Boiler Manufacturer: Hopkinson for Boiler# 1 & 2 and Sempell for Boiler# 3 & 4 Type: Spring Loaded Set Pressure: 50.2/50.5 Barg Quantity: 77,200 Kg/h = 21.4 kg/s	Steel

Safety valve-Superheater: Number Installed Per Boiler: 1
 Manufacturer: Waagner Biro, Type: Spring Loaded Set Pressure: 45.4
 Steam Quantity: 51,928 Kg/h = 14.4 kg/s

1.1.10	Boiler drum:	4	Construction: Welded Material: 19 Mn 5 Horizontal Length: 6.5 M Internal Diameter: 1.416 M Thickness: 42 mm Design Pressure: 50 Barg. Vol. of Water at Normal Working Level: 5.5 M3 Volume of Steam Space Above NWL : 5.5 M3	Steel
1.1.11	Blow-down vessel:	4	Internal Diameter: 1476 mm Thickness: 12 mm	Steel
1.1.12	Cyclone: (water collecting vessel)	4	Design Pressure: 50 Barg. Diameter: 560 mm End and Shell Wall Thickness: 20 mm	Steel
1.1.13	Clean drains tank:	4	Inside Dimensions: 3360 x 3360 x 1500 mm, Thickness: 10 mm	Steel
1.1.14	High pressure drains tank:	4	Inside Diameter: 1476 mm Shell and End Wall Thickness: 12 mm Method of Steam Distribution System: Multi-Hole Nozzle	Steel
1.1.15	Forced draft fan	4	Radial Type with Double Suction Arrangements-Waagner Biro	Steel
1.1.16	Silencer	16	Each Boiler has 4 Nos	Steel
1.1.17	Gas Burners	24	Each Boiler has 6 Nos Number of Nozzles per Burner: 6 Nozzles	Steel
1.1.18	Drain recirculation Pump	8	Each Boiler has 2 Pumps (A&B)	Steel
1.1.19	Chimney	4	Dia. 100 Inch X Height 28 meters	Steel
1.1.20	Sample Cooler Cooling System	8	2 per boiler Shell 8" Dia. X 500 mm length – SS304	Steel
1.1.21	Live Steam System Valves	4	12" Valve	Steel
1.1.22	Feed Water Valves	4	12" Valve	Steel
1.1.23	Attemperator Spray Valves	4	1 1/2 " Valves	Steel
1.1.24	Gas Valves	18	Each boiler: 8" V/V (12 Nos.) -- 8" NRV (6 Nos.)	Steel
1.1.25	Main Steam Stop Valves	4	12" Valve	Steel
1.1.26	Start Up Valves	4	6" Isolating Valve	Steel
1.1.27	Drum Level Indicator & Valves	4	3/4" Valve	Steel
1.1.28	Auxiliary Equipment	-	Air Compressor, Seawater Service Equipment associated with Each Boiler	Steel
1.1.29	Furnace tubes	-	Outside Dia.: 70 mm Tube Thickness: 4/5.6 mm Combustion chamber rear wall: Tube Material: St 35.8/II Tube Outside Diameter: 60.3 mm Tube Thickness: 4 mm	

1.1.30	Economizer – I (old)	1	Old Economizer removed from Phase – I Boilers in 2015 & kept beside Boiler # 4. Tube Material: St 35.8/II Tube Outside Diameter: 31.8 mm Tube Thickness: 3.2 mm	Steel
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1.2 Boilers 1 to 4 Electrical Parts:

1.2.1	FD FAN Motor (4 on Service + 1 Spare)	5	Fram size KR5435B-AQ-06, 3.3KV, 400KW, 990 RPM & Weight 3000 KG	Copper/Steel
1.2.2	Ignition Cooling Fan Motor	4	Fram size AMC13311A A798, 415V, 5.5KW, 2930 RPM & Weight 15KG	Copper/Steel
1.2.3	Steam stop valve actuator	4	415V, 0.08KW, 24RPM & weight 80KG	Copper/Steel
1.2.4	Steam Bypass valve actuator	4	415V, 1.5KW, 2800RPM & weight 35KG	Steel

1.3 Boilers 1 to 4 Instrumentation Parts:

1.3.1	Pressure Transmitter	32	ABB ASD800 Range -1 - +100 bar	Aluminum
1.3.2	Pressure Transmitter	20	ABB ASD800 Range -60 - +60 mbar	Aluminum
1.3.3	Flow Transmitter/Fuel gas	12	ABB ASK800 Range -400- +400 mbar	Aluminum
1.3.4	Flow Transmitter	8	ABB ASK800 Range -60 - +60 bar	Aluminum
1.3.5	Level Transmitter/Cyclone	8	ABB ASK800 Range -2.5 - +2.5 bar	Aluminum
1.3.6	Level Transmitter/Cyclone	4	ABB ASD800 Range -400 - +400 mbar	Aluminum
1.3.7	Temperature Transmitters	8	ABB ASD800 Range -16 - +16	Aluminum
1.3.8	Control Valve/Start-up valve	220	ABB TTH200E1 HBSEM	Aluminum
1.3.9	Control Valve	4	DRAG, Type: 100D, STI pneumatic Actuator double acting CCI SC/V 320 , Fisher Electro-Pneumatic Positioner Type: DVC 6030, Norgren B74G Regulator	Aluminum
1.3.10	Control Valve	4	ARCA, 6HL1, Actuator Type: MFI-20.6OE, Size: 1:/ welding ends, Body Material: A217WC6	Aluminum
1.3.11	Control Valve	8	BLAKEBOROUGH, BV502/A21FFB 1"	Carbon Steel
1.3.12	Control Valve	4	BLAKEBOROUGH, BV895/A29EGK, 6"	Carbon Steel
1.3.13	Control Valve	4	BLAKEBOROUGH, BV500/AA21FKD, 4"	Carbon Steel
1.3.14	Control Valve	4	ELOMATIC Actuator, Type: P 2500, Manual Override Type: MO-520	Carbon Steel
1.3.15	Control Valve	4	Regal RMG, Type RMG 300A-10004276 16 Bar	Carbon Steel
1.3.16	Pressure Regulator	4	ACTARIS ,Type 12 DN 80 ,16 Bar Max	Carbon Steel
1.3.17	Position Transmitter	45	Norgren B72 Series	Carbon Steel
1.3.18	ON-OFF Valve	45	SINGLE ACTING , TYPE: TZID-C WITH PRESSURE GAUGE BLOCK, ABB.	Carbon Steel
1.3.19	ON-OFF Valve	72	ALBRECHT-AUTOMATIK 50259 Pulheim, Class A, Type: GSV, DN: 100	Carbon Steel

1.3.20	ON-OFF Valve	48	HERION 3/2 directional valve, Connection size ¼", operating pressure 0-10bar, 24 Volt DC	Carbon Steel
1.3.21	Pressure Switch	24	Uni Geraie 47652WEEZE ,type 1-EVA5-4 24 Volt DC	Copper
1.3.22	Pressure Gauge	36	Honeywell DWR06-363 Range -0.1 - +0.6 bar	Copper
1.3.23	Air Register Actuator	48	Wika EN 837-1 100 bar	Stainless Steel
1.3.24	Thermal Links	24	IMI NORGREN,CYLINDER, AIR SLIDE 2 INCH BORE, P/NO: M/920/300 STROKE LENGTH: 300 MM OPERATING PRESSURE: 2-10 BAR	Aluminum
1.3.25	Igniter guns	24	FUSELINK, THERMAL 100 DEG.C RS.NO: 413-169 FOR PHASE I BOILER BURNER MANAGEMENT SYSTEM	Stainless Steel
1.3.26	Flame Detectors	24	Killark, CAT No: HFC1006	Stainless Steel
1.3.27	Junction Box	13	Flame System-Infrared Type: Dlx 100 UI-P 24 V Dc, Current O/P # 4-20ma Enclosure # Ip65 With Calbe Gland (En60529) With P Lug Conn & 5 M Cable	Stainless Steel
1.3.28	Oxygen Analyzer	4	ABB - AZ20	Aluminum
1.3.29	Instrument Tube	80m	Stainless steel, 316L,Type: Seamless	Carbon Steel
1.3.30	Instrument Tube	620m	Stainless steel, 316L,Type: Seamless, S.S/10mm	Stainless Steel
1.3.31	Instrument Tube	1190m	Stainless steel, 316L,Type: Seamless, S.S/12mm	Stainless Steel
1.3.32	Instrument Cables	35m	2 pairs	Copper
1.3.33	Instrument Cables	20m	4 pairs	Copper

2. Phase-II Auxiliary Boiler



- **Manufacturer: MACCHI MILAN, ITALY**
- **Steam Production at MCR: 165 T/H**
- **Design Pressure: 20 barg**
- **Steam Conditions at super heater outlet: 14 bar g and 220°C**
- **Number of Units: 1 Unit**

2.1. Phase-II Auxiliary Boiler - Mechanical Parts:

No	Item/Equipment / Classification	Photo/ Drawing	Q	Description	Major Material
2.1.1	Superheater		1	Vertical type, completely drainable and multi-pass Heating surface:99 m2 Tube diameter:51 mm	Steel
2.1.2	Economizer		1	Heating surface:1.856 m2 Tubes diameter:51 mm Tubes thickness:3.2 mm Tubes material: SA 192	Steel
2.1.3	Forced Draft Fan		1	Speed:1470 rpm Nominal capacity:174.5 m3/h Power supply:3.3 kV Rated power:400 kW Rated current:85 A	Steel
2.1.4	De-superheater		1		Steel
2.1.5	Burners		3	Type:MV 24/I/C Number:3 Burners Oil atomizer type:2-90° No. of atomizer per burner:1 Oil atomisation:Steam	Steel
2.1.6	Water drum		1		Steel
2.1.7	Steam drum		1		Steel
2.1.8	Water Tube pressurized "TITAN M " Package Boiler		1	Steam Production 165.000 Kg/Hr	Steel
2.1.9	Aux. Boiler fuel oil to burner valves		1	1 1/2" X 2" X 3" Valve	Steel
2.1.10	Aux. Boiler fuel gas to burner valves		1	6" Valve	Steel
2.1.11	Aux. Boiler super heater valves		1	6" Valve	Steel
2.1.12	Aux. Boiler blow down boiler oil flow valves		1	6" Valve	Steel
2.1.13	Aux. Boiler natural gas valves		1	10" & 6" Valve	Steel
2.1.14	Aux. Boiler feed water vent drain valve		1	10" & 6" Valve	Steel
2.1.15	Aux. Boiler water drum drain valves		1	3/4", 1", 2" Valves	Steel

2.1.16	Clean water pump valves	1	3/4", 1", 2" Valves	Steel
2.1.17	Feed water pump valves (suction/ delivery valves)	1	10" & 6" Valve	Steel
2.1.18	Feed water chemical dosing valves	1	1/2" Valve	Steel
2.1.19	Service water valves (Aux. Boiler/ HRB)	1	6" NRV	Steel
2.1.20	Service water valves (aux. Boiler/ HRB downstream & up stream)	1	6" NRV	Steel
2.1.21	Aux. Boiler Demin. – chlorination valves	1	6" NRV	Steel
2.1.22	Deaerator	1	2 Meter Dia. X 3.5 Meter Height	Steel
2.1.23	Demineralized Water Tank A	1	4.5 Meter Dia. X 8.8 Meter Height	Steel
2.1.24	Demineralized Water Tank B	1	4.5 Meter Dia. X 8.8 Meter Height	Steel
2.1.25	Feed makeup pump A	1	4.5 Meter Dia. X 8.8 Meter Height	Steel
2.1.26	Feed makeup pump B	1	4.5 Meter Dia. X 8.8 Meter Height	Steel
2.1.27	Clean drain tank	1	1.4 Meter Dia. X 4.5. Meter Length	Steel
2.1.28	Steam to Deaerator safety valves	1	4"Valve	Steel
2.1.29	Auxiliary Boiler Safety Valves	3	6" Valve	Steel
2.1.30	HRB Safety Valves	1	4"Valve	Steel
2.1.31	Deaerator with feed tank no.5 safety valves	1	4"Valve	

2.2. Phase-II Auxiliary Boiler - Electrical Parts:

2.2.1	FD Fan Motor	1	Frame Size AHSA-450MB-04A Voltage 3.3KV Power 400KW Speed: 1490RPM Weight 3000KG	Copper/Steel
2.2.2	Boiler Feed Water Valve actuator	2	Frame Size 1C 060/70-48 Voltage 415V power speed 0.07KW Speed 48 RPM Weight 65KG	Copper/Steel
2.2.3	Boiler Feed Water Suction Valve actuator	2	Frame Size 2C 060/70-48 Voltage 415V power speed 0.07KW Speed 48 RPM Weight 65KG	Copper/Steel
2.2.4	Deaerator Over Flow Valve actuator	2	Frame Size m1C 060 Voltage 415V Power 0.23KW Speed 1430 RPM Weight 37KG	Copper/Steel
2.2.5	Feed Water Suction Valve actuator	1	Frame Size 2C220/250-48 Voltage 415V Power 0.25KW Speed 48 RPM Weight 37 KG	Copper/Steel
2.2.6	Make Up Valve actuator	2	Frame Size M05C 0410 Voltage 415V Power 0.16KW Speed 1425 RPM Weight 75 KG	Copper/Steel
2.2.7	Make Up Valve actuator	1	Frame Size M05CR 016 Voltage 415V Power 0.07KW Speed 1420 RPM Weight 37 Kg	Copper/Steel
2.2.8	Make-Up to Deaerator Valve actuator	2	Frame Size M 05Cr040/55-20 Voltage 415V Power 0.055KW Speed 20 RPM Weight 26 KG	Copper/Steel

2.2.8	Make-Up to Deaerator Valve actuator	1	Frame Size 1C 060/70-48 Voltage 415V Power 0.07KW Speed 48 RPM Weight 26 KG	Copper/Steel
2.2.9	Aux. Boiler Valve Motor	1	Frame Size 2C 220/250-48 Voltage 415V Power 0.25KW Speed 48 RPM weight 65 Kg	Copper/Steel
2.2.10	Aux. Boiler Steam Outlet actuator	1	Frame Size 4C 440/500-48 Voltage 415V Power 0.5KW Speed 48 RPM Weight 70 Kg	Copper/Steel
2.2.11	Feed Water valve actuator	2	Frame Size 1C 060/70-48 Voltage 415V power speed 0.07KW Speed 48 RPM Weight 65 Kg	Copper/Steel
2.2.12	Feed Water valve actuator	1	Frame Size 1Cr 060/125-18 Voltage 415V power speed 0.125KW Speed 18 RPM weight 26KG	Copper/Steel
2.2.13	Feed Water Intake Bypass Valve actuator	1	Frame Size 1C 060/70-48 Voltage 415V Power 0.07KW Speed 48 RPM weight 26KG	Copper/Steel
2.2.14	Fuel Gas to Burner valve actuator	1	Frame Size M 05C 045 Voltage 415V Power 0.4KW Speed 2780 RPM weight 26KG	Copper/Steel
2.2.15	Fuel Gas to Burner valve actuator	2	Frame Size 05CR 040/55-20 Voltage 415V Power 0.055KW Speed 20 RPM weight 26KG	Copper/Steel
2.2.16	HCV Valve actuator	1	Frame Size 05CR 016/20-20 Voltage 415V Power 0.02KW Speed 20 RPM weight 26KG	Copper/Steel
2.2.17	Fuel Oil to Burner actuator	1	Frame Size 05CR 016/20-20 Voltage 415V Power 0.055KW Speed 20 RPM weight 26KG	Copper/Steel
2.2.18	Steam Valve actuator	2	Frame Size 05C040/55-20 Voltage 415V Power 0.055KW Speed 20 RPM weight 26KG	Copper/Steel

2.3. Phase-II Auxiliary Boiler - Instrumentation Parts:

2.3.1	Control Valves	6	MFR.: ITALINPAINTI-NUVOPIGNONE	Carbon Steel
2.3.2	Solenoid Valves	6	MFR: Alfa	Brass
2.3.3	Gas Block Valve	15	MFR: Alfa	Brass
2.3.4	Igniter Valve	9	MFR: Alfa	Brass
2.3.5	Gas Block V/V	36	MFR: Norgren	Brass
2.3.6	I/P Converter Regulator	12	FISHER	Aluminum
2.3.7	limit Switches	6	mfr: SQUARE D	Aluminum
2.3.8	Isolating Valve	24	mfr: SQUARE D	Aluminum
2.3.9	Pressure Transmitters	17	Mfr.Bailly	Carbon Steel
2.3.10	Level Transmitters	2	Mfr. ABB	Carbon Steel
2.3.11	Flame Detector	6	SIE FORNEY SPA UVISOR - ITALY	Aluminum

2.3.12	Igniter Gun	3	TAP/21/1700	Carbon Steel
2.3.13	Thermocouples	10	Mfr: LABEN MILANO-ITALY	Stainless Steel
2.3.14	I/P Converters	1	Mfr.Bailly	Aluminum

3. Phase-II Heat Recovery Boiler



- **Manufacturer: MACCHI MILAN, ITALY**
- **Steam Production at MCR: 80 T/H**
- **Design Pressure: 20 barg**
- **Steam Conditions at super heater outlet: 14 bar g and 215°C**
- **Fuel Gas Temp. at Boiler outlet: 196°C**
- **Fuel Gas Flow at Boiler inlet: 472.537 Kg/hr.**

3.1. Phase-II Heat Recovery Boiler - Mechanical Parts:

No	Item/Equipment / Classification	Photo/ Drawing	Q	Description	Major Material
3.1.1	Superheater		1	Vertical type, completely drainable and multi-pass Heating surface: 152 m ² Tube diameter: 51 mm Tubes thickness: 4 mm Tubes material: SA 192	Steel
3.1.2	Economizer		1	Heating surface: 4.075 m ² Tubes diameter: 51 mm Tubes thickness: 3.2 mm Tubes material: SA 192	Steel
3.1.3	Evaporator		1	Heating surface: 11.820 m ² Tubes diameter: 51 mm Tubes thickness: 3.2 mm Tubes material: SA 192	Steel
3.1.4	Forced circulation system		2	Manufacturer : Termomrccanica Italiana Type : RBS-K 250-32 Speed : 1480 Nominal Capacity : m3 /h 628 Nominal head: M.W.G 32,6	Steel
3.1.5	Steam Drum		1	O.D : 1600 mm Thickness : 20 mm Length 6500 Material :SA 202 gr.70	Steel
3.1.6	Safety valves		2	4" Valves	Steel
3.1.7	Chemical dosing system valves		1	3/4" Valve	Steel
3.1.8	HRB valves		1	12" Valve	Steel
3.1.9	Feed Valves		1	4" Valve	Steel
3.1.10	Drum valves		2	3/4" Valves	Steel
3.1.11	Main steam valves		1	12" H.P. Steam Gate Valve motorized	Steel
3.1.12	Recirculation pump A valves		1	12" NRV of Motorized Gate Valve	Steel
3.1.13	Recirculation pump B valves		1	12" NRV of Motorized Gate Valve	Steel
3.1.14	De-super heater		1	Mfr: Eur Control. Type : DA 4 /C/ANSI 300 RF	Steel

3.1.15	Attemperator valves	1	2" Pneumatic Valve	Steel
3.1.16	De-super heater valves	1	2" Pneumatic Valve	Steel
3.1.18	Service water valves (Aux. Boiler/ HRB)	1	6" NRV	Steel
3.1.19	Service water valves (aux. Boiler/ HRB downstream & up stream)	1	6" NRV	Steel
3.1.20	Aux. Boiler Demin. – chlorination valves	1	6" NRV	Steel
3.1.21	Deaerator	1	2 Meter Dia. X 3.5 Meter Height	Steel
3.1.22	Demineralized Water Tank A	1	4.5 Meter Dia. X 8.8 Meter Height	Steel
3.1.23	Demineralized Water Tank B	1	4.5 Meter Dia. X 8.8 Meter Height	Steel
3.1.24	Feed makeup pump A	1	4.5 Meter Dia. X 8.8 Meter Height	Steel
3.1.25	Feed makeup pump B	1	4.5 Meter Dia. X 8.8 Meter Height	Steel
3.1.26	Clean drain tank	1	1.4 Meter Dia. X 4.5. Meter Length	Steel
3.1.27	Steam to Deaerator safety valves	1	4"Valve	Steel
3.1.28	Auxiliary Boiler Safety Valves	3	6" Valve	Steel
3.1.29	HRB Safety Valves	1	4"Valve	Steel
3.1.30	Deaerator with feed tank no.5 safety valves	2	4"Valve	Steel

3.2. Phase-II Heat Recovery Boiler - Electrical Parts:

3.2.1	HRB Recirculation motor	2	Frame Size KA3-280S Voltage 415V Power 68KW Speed: 1475RPM Weight 700KG	Copper/Steel
3.2.2	Booster Pump Motor	2	Frame Size KME RB-112 Voltage 415V Power 4KW Speed: 1430RPM Weight 50KG	Copper/Steel
3.2.3	Fuel Oil Leakage Motor	2	Frame Size QuFa80 Voltage 415V Power 0.9KW Speed: 3000RPM Weight 15KG	Copper/Steel
3.2.4	Boiler Feed Pump Motor (2 on Service + 1 Spare)	3	Frame Size QuNXy450-0A2 Voltage 3.3KV Power 185KW Speed: 2971RPM Weight 2500KG	Copper/Steel
3.2.5	HRB Dosing Motor	2	Frame Size GD71S Voltage 415V Power 0.37KW Speed: 1400RPM Weight 7KG	Copper/Steel
3.2.6	Aux. Tank Dosing motor	2	Frame Size Ka071 Voltage 415V Power 0.28KW Speed: 1400RPM Weight 7KG	Copper/Steel
3.2.7	Feed Tank Dosing Motor	2	Frame Size Ka071 Voltage 415V Power 0.28KW Speed: 1400RPM Weight 7KG	Copper/Steel

3.2.8	Make-Up Motor	2	Frame Size KA1 132s Voltage 415V Power 6.25KW Speed: 1400RPM Weight 70KG	Copper/Steel
3.2.9	HRB 2 Mixer Motor	1	Frame Size GD71s Voltage 415V Power 0.37KW Speed: 1395RPM Weight 7KG	Copper/Steel
3.2.10	Aux Tank3 Mixer Motor	1	Frame Size GD71s Voltage 415V Power 0.37KW Speed: 1395RPM Weight 7KG	Copper/Steel
3.2.11	Feed Tank 1 Mixer motor	1	Frame Size GD71s Voltage 415V Power 0.37KW Speed: 1395RPM Weight 7KG	Copper/Steel
3.2.12	Feed Up Valve actuator	1	Frame Size 05C 040/28-70 Voltage 415V Power 0.028KW Speed: 70RPM Weight 37KG	Copper/Steel
3.2.13	Down Feed Valve actuator	1	Frame Size 05C 040/28-70 Voltage 415V Power 0.028KW Speed: 70RPM Weight 37KG	Copper/Steel
3.2.14	Main Stream Valve actuator	1	Frame Size 3WD/EPAC/1-1B99 Voltage 415V Power 0.028KW Speed: 70RPM Weight 37KG	Copper/Steel
3.2.15	Start-Up Feed Valve actuator	1	Frame Size 05C 040/28-70 Voltage 415V Power 0.028KW Speed: 70RPM Weight 37KG	Copper/Steel
3.2.16	HRB Circulation Pump Valve actuator	1	Frame Size 2C 220/250-36 Voltage 415V Power 0.23KW Speed: 36RPM Weight 65KG	Copper/Steel
3.2.16	HRB Circulation Pump Suction Valve actuator	1	Frame Size 4C 220/360-56 Voltage 415V Power 0.36KW Speed: 36RPM Weight 65KG	Copper/Steel
3.2.17	HRB Delivery Valve actuator	1	Frame Size 2C 220/250-36 Voltage 415V Power 0.25KW Speed: 36RPM Weight 65KG	Copper/Steel

3.3. Phase-II Heat Recovery Boiler - Instrumentation Parts:

3.3.1	Flow Control Valve Actuator	1	Mfr.:Brown Boveri , ANSI 316	Carbon Steel
3.3.2	Control Valve	2	Mfr.: Nuvopignone, Bari-Italia	Carbon Steel
3.3.3	Air Filter, Regulator	3	Mfr: NORGREN	Aluminum
3.3.4	Air Filter, Regulator	3	Mfr: FISHER	Aluminum
3.3.5	I/P Converter	1	Mfr: FISHER	Aluminum
3.3.6	Pressure Transmitters	6	Mfr: SMC,Model:IP300.IP310,pipe conn: 1/4 inch ,1/8 inch gauge ports	Aluminum
3.3.7	Flow Transmitters	6	Mfr.Bailly	Aluminum
3.3.8	Level Transmitters	2	Mfr.Bailly	Aluminum
3.3.9	Level Switches	2	Mfr: LABEN MILANO-ITALY	Aluminum
3.3.10	Temperature Switches	5	Mfr: SMC, Model: IL220, 3 PORTS 1/4 inch	Aluminum
3.3.11	Thermocouples	9	Mfr: LABEN MILANO-ITALY	Stainless Steel
3.3.12	I/P Converters	13	Norgren,a16-Mexico,3/8 Inch prt size,1/4 inch Gauge Size	Stainless Steel

4. Phase-I Distiller 1A/1B



- **Manufacturer: SOCIETA ITALIANA RESINE, ITALY**
- **No. OF UNITS: 2**
- **OUTPUT: 2.5 MGPD**
- **No. of Stages: 15 Stages (3 Heat Rejection Stages & 12 Heat Recovery Stages)**
- **Type: MSF**

4.1. Phase-I Distiller 1A & 1B - Mechanical Parts:

No	Item/Equipment / Classification	photo/ Drawing	Q	Description	Major Material
4.1.1	Brine Heater		2	No of Tube Passes: 1 Total Tubes: 3900 Tube Length: 9000 mm Tube Diameter: ¾"	Shell: Carbon steel Tubes: Cu70Ni30
4.1.2	Condensate cooler		2	No of Tube Passes: 2 Total Tubes: 258 Tube Length: 1500 mm Tube Diameter: ¾"	Shell: Carbon steel Tubes: Al-Brass
4.1.3	1st Vacuum Condenser		2	No of Tube Passes: 4 Total Tubes: 1100 Tube Length: 4200 mm Tube Diameter: ¾"	Shell: AISI 316 Tubes: Titanium
4.1.4	2nd Vacuum Condenser		2	No of Tube Passes: 2 Total Tubes: 240 Tube Length: 4200 mm Tube Diameter: ¾"	Shell: AISI 316 Tubes: Titanium
4.1.5	3rd Vacuum Condenser		2	No of Tube Passes: 1 Total Tubes: 120 Tube Length: 2000 mm Tube Diameter: ¾"	Shell: AISI 316 Tubes: Titanium
4.1.6	4th Vacuum Condenser		2	No of Tube Passes: 1 Total Tubes: 120 Tube Length: 2000 mm Tube Diameter: ¾"	Shell: AISI 316 Tubes: Titanium
4.1.7	Recovery Stages Condenser Tube Bundle (1-12)		2 4	No of Stages: 12 Total Tubes per Stage: 4204 Tube Length: 9500mm Tube Diameter: ¾" Tube Material: Cu70Ni30 (Stages 1-2) / Al-Brass (Stages 3-12)	Cu70Ni30 Al-Brass
4.1.8	Reject Stages Condenser Tube Bundle (13-15)		6	No of Stages: 3 Total Tubes per Stage: 2796 Tube Length: 9500mm Tube Diameter: ¾"	Cu70Ni30

Tube Material: Cu70Ni30

4.1.9 Deaerator

2

Shell Material: Carbon Steel, 40 mm thickness
Dimensions: Height 5780mm, Length 7700mm, Width 1980mm
Internal Material: AISI 316

Carbon Steel
AISI 316

4.1.10 Stages Demisters



2

Total Demister Area Per Distiller: 193 m²
Material: Monel 400

Monel 400

4.1.11 Steam Ejector:
Quick Start

2

Moving Steam (Design Condition): 35-40 bar abs. 455 °C
Moving Steam Flow: 5000 Kg/h
Material: AISI 316

AISI 316

4.1.12 Steam Ejector:
Vacuum System
1st Stage

2

Moving Steam (Design Condition): 35-40 bar abs. 455 °C
Moving Steam Flow: 1000 Kg/h
Material: AISI 316

AISI 316

2.1.13 Steam Ejector:
Vacuum System
2nd Stage

2

Moving Steam (Design Condition): 35-40 bar abs. 455 °C
Moving Steam Flow: 500 Kg/h
Material: AISI 316

AISI 316

4.1.14 Steam Ejector:
Vacuum System
3rd Stage

2

Moving Steam (Design Condition): 35-40 bar abs. 455 °C
Moving Steam Flow: 200 Kg/h
Material: AISI 316

AISI 316

4.1.15 Steam Ejector:
Vacuum System
4th Stage

2

Moving Steam (Design Condition): 35-40 bar abs. 455 °C
Moving Steam Flow: 100 Kg/h
Material: AISI 316

AISI 316

4.1.16 Steam Ejector:
P-I Priming

2

Moving Steam (Design Condition): 35-40 bar abs. 455 °C
Moving Steam Flow: 50 Kg/h
Material: AISI 316

AISI 316

4.1.17 Steam Turbine: Sea
Water Pump Driver
(TP-1)



2

RTD Power: 715 Kw
Speed: 9000 RPM
Gear: (9000/725)

Cast Iron







4.1.18 Steam Turbine: Brine
Pumps Driver
(TP-2)




2

RTD Power: 1655 Kw
Speed: 8500 RPM
Gears: (8500/1250) & (1250/480)

Cast Iron

4.1.19	Sea Water Feeding Pump		2	Type: Horizontal Rated Flow: 5800 m ³ / h Rated Head: 35 m Casing Material: <i>Ni Resist 1B</i> Impeller Material: <i>AISI 316L</i> Shaft Material: <i>Inox 18/8</i>	Ni Resist 1B AISI 316L Inox 18/8
4.1.20	Brine Extraction Pump		2	Type: Horizontal Rated Flow: 6100 m ³ / h Rated Head: 76 m Casing Material: <i>Ni Resist 1B</i> Impeller Material: <i>Ni Al-Bronze</i> Shaft Material: <i>Inox 18/8</i>	Ni Resist 1B Ni Al-Bronze Inox 18/8
4.1.21	Brine Booster Pump		2	Type: Horizontal Rated Flow: 6100 m ³ / h Rated Head: 76 m Casing Material: <i>Ni Resist D2B</i> Impeller Material: <i>Ni Al-Bronze</i> Shaft Material: <i>Inox 18/8</i>	Ni Resist D2B Ni Al- Bronze Inox 18/8
4.1.22	Product Extraction Pump		2	Type: Horizontal Rated Flow: 475 m ³ / h Rated Head: 40 m Casing Material: <i>Cast Iron</i> Impeller Material: <i>Bronze Zn Free</i> Shaft Material: <i>Inox 18/8</i>	Cast Iron Bronze Inox 18/8
4.1.23	Blowdown Extraction Pump		2	Type: Horizontal Rated Flow: 830 m ³ / h Rated Head: 20 m Casing Material: <i>Ni Resist 1B</i> Impeller Material: <i>Ni Al-Bronze</i> Shaft Material: <i>Inox 18/8</i>	Ni Resist 1B Ni Al-Bronze Inox 18/8
4.1.24	Condensate Extraction Pump		2	Type: Vertical Rated Flow: 78 m ³ / h Rated Head: 40 m Casing Material: <i>Cast Iron</i> Impeller Material: <i>Bronze Zn Free</i> Shaft Material: <i>Inox 18/8</i>	Cast Iron Bronze Inox 18/8

4.1.25	De-superheater Pump	2	Type: Vertical Rated Flow: 10 m ³ / h Rated Head: 100 m Casing Material: Cast Iron Impeller Material: Bronze Zn Free Shaft Material: Inox 18/8	Cast Iron Bronze Inox 18/8
4.1.26	Sulphite Recirculation Pump	2	Type: Vertical Rated Flow: 8 m ³ / h Rated Head: 10 m Casing Material: Cast Iron Impeller Material: Bronze Zn Free Shaft Material: Inox 18/8	Cast Iron Bronze Inox 18/8
4.1.27	Vent Condenser Extraction Pump	2	Type: Horizontal Rated Flow: 400 m ³ / h Rated Head: 18 m Casing Material: Ni Resist 1B Impeller Material: AISI 316 L Shaft Material: AISI 316 L	Ni Resist AISI 316L
4.1.28	Acid Cleaning Pump	2	Type: Horizontal Rated Flow: 300 m ³ / h Rated Head: 20 m Casing Material: Ebonized Steel Impeller Material: Ebonized Steel Shaft Material: Ebonized Steel	Ebonized Steel
4.1.29	Demin Feeding Pump	2	Type: Horizontal Rated Flow: 25 m ³ / h Rated Head: 27 m Casing Material: Cast Iron Impeller Material: Bronze Zn Free Shaft Material: Inox 18/8	Cast Iron Bronze Inox 18/8
4.1.30	HCL on Load Dosing Pump	2	RTD Flow: 310 liter/h RTD Power: 0/75 kw Membrane Material: Teflon Internal Material: PVC	Teflon PVC
4.1.31	Sulphite Dosing Pump	2	RTD Flow: 66 liter/h RTD Power: 0.18 kw Membrane Material: Teflon Internal Material: AISI 316	Teflon AISI 316

4.1.32	Polyphosphate Dosing Pump	2	RTD Flow: 200 liter/h RTD Power: 0.55 kw Membrane Material: <i>Teflon</i> Internal Material: <i>AISI 316</i>	Teflon AISI 316
4.1.33	NaOH Dosing Pump	2	RTD Flow: 200 liter/h RTD Power: 0.55 kw Membrane Material: <i>Teflon</i> Internal Material: <i>AISI 316</i>	Teflon AISI 316
4.1.34	HCL Charging & Dosing Pump	2	RTD Flow: 4000 liter/h RTD Power: 0.75 kw Body & Impeller Material: <i>PVC</i> Shaft Material: <i>AISI 316</i>	Teflon AISI 316
4.1.35	NaOH Dosing Pump	2	RTD Flow: 200 liter/h RTD Power: 0.55 kw Membrane Material: <i>Teflon</i> Internal Material: <i>AISI 316</i>	Teflon AISI 316
4.1.36	Polyphosphate Mixer	2	RTD Power: 0.55 kw Material: <i>AISI 316</i>	AISI 316
4.1.37	Sulphite Mixer	2	RTD Power: 0.55 kw Material: <i>AISI 316</i>	AISI 316
4.1.38	NaOH Mixer	2	RTD Power: 0.55 kw Material: <i>AISI 316</i>	AISI 316
4.1.39	Vacuum Discharge Drum	2	Height: 1250 mm Diameter: 1000 mm Volume: 1 m ³ Material: <i>Carbon Steel</i>	Carbon Steel
4.1.40	Polyphosphate Drum	2	 Height: 2000 mm Diameter: 1800 mm Volume: 5 m ³ Material: <i>Inox 18/8</i>	Inox 18/8

4.1.41	Sulphite Drums		<p>2</p> <p>Height: 2000 mm Diameter: 1800 mm Volume: 5 m³ Material: <i>Carbon Steel</i></p>	Carbon Steel
4.1.42	Hydrochloric Acid Drum		<p>2</p> <p>Height: 2000 mm Diameter: 1800 mm Volume: 5 m³ Material: <i>Carbon Steel</i></p>	Carbon Steel
4.1.43	Acid Cleaning Drum		<p>2</p> <p>Height: 6000 mm Diameter: 2100 mm Volume: 20 m³ Material: <i>Carbon Steel</i></p>	Carbon Steel
4.1.44	Air receivers		<p>Dimensions 2.4 m Dia. High 3.5 m Thickness 16 mm Capacity 15.823 m³</p>	Carbon Steel
4.1.45	Instrument Air Compressor		<p>1</p> <p>MFR: ELGI Capacity: 13.88 m³/min Type: E75-9</p>	Carbon Steel

4.1.46	Air Dryer		1 MFR: ELGI Capacity: 21.2 m ³ /min Type: EGRD 750	Steel/Copper
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4.2. Phase-I Distiller 1A & 1B - Electrical Parts:

4.2.1	TP2 Aux. Oil Pump Motor	2	Frame size:160M4, 415V, 11KW, 1400 RPM, Total weight: 75 KG	Copper/Steel
4.2.2	TP-1 /2 Speed Motor	2	Frame size:DV44E2/114, 415V, 0.25 KW, 1350 RPM, Total weight:5 KG	Copper/Steel
4.2.3	Sump Pump motor	2	Frame size: DA112MA, 415V, 4 KW, 2830 RPM, total weight: 45 KG	Copper/Steel
4.2.4	G3 Gear Oil Pump Motor	1	Frame size: DR90S4, 415V, 1.1 KW, 1410 RPM, Total weight:16 Kg	Copper/Steel
4.2.5	Instrument Air Compressor motor (B)	1	Frame size: FNC280S4, 415V, 75 KW, 1500 RPM, Total weight: 845 KG	Copper/Steel
4.2.6	Instrument Air Compressor motor (A)	1	Frame size: FNC280S4, 415V, 75 KW, 1500 RPM, Total weight: 650 KG	Copper/Steel
4.2.7	Acid Cleaning Pump Motor	1	Frame size: JSNF200L4, 415V, 30KW, 1500 RPM, Total weight:205 KG	Copper/Steel
4.2.8	De-supper Heater B7 Motor	2	Frame size: JSNF132M4, 415V, 7.5 KW, 1500 RPM, Total weight: 75 KG	Copper/Steel
4.2.9	Distillate product Pump Motor	2	Frame size: GNC 315M64, 415V, 90 KW,1000 RPM, Total weight: 720 KG	Copper/Steel
4.2.10	Blow Down Pump Motor	2	Frame size: FNC315S6A, 415V, 75 KW, 1000 RPM, Total weight: 830 KG	Copper/Steel
4.2.11	Condensate Pump Motor B6	2	Frame size: 225S4, 415V, 37 KW, 1470 RPM, Total weight: 250 KG	Copper/Steel
4.2.12	TP-1 Oil Pump Motor	2	Frame size: 132M4, 415V, 7.5 KW, 1400 RPM, Total weight: 75 KG	Copper/Steel
4.2.13	HCL Dosing Pump Motor	8	Frame size: Heva80L4, 415V, 1 HP = 0.745 KW , 1400 RPM, Total weight: 30 KG	Copper/Steel
4.2.14	Anti-foam / Anti-Scale / Sodium Sulphite Motor	14	Frame size: NFC 51-100, 415V, 0.55 KW, 1400 RPM, Total weight: 15 KG	Copper/Steel

4.2.15	Sea Water Discharge Valve actuator	2	Frame size:---, 415V, 1.5 KW, 2880 RPM, Total weight: 25 KG	Copper/Steel
4.2.16	Sea water Speed Changer valve actuator	2	Frame size: 132, 415V, 1.5 KW, 1440 RPM, Total weight: 25 KG	Copper/Steel
4.2.17	Brine Discharge Valve actuator	2	Frame size:---, 415V, 1.5 KW, 2800 RPM, Total weight: 25 KG	Copper/Steel
4.2.18	Brine Speed Changer Valve actuator	2	Frame size: D160L, 415V, 1.5 KW, 1450 RPM, Total weight: 25 KG	Copper/Steel
4.3. Phase-I Distiller 1A & 1B - Instrumentation Parts:				
4.3.1	Control Valves	2	DAVIS PNEUMATIC SYS. LTD, Power Cylinder, MS 80 x 150	Carbon Steel
4.3.2	Control Valves	4	AIR TORQUE S.P.A., MODEL: AT551S08, SIZE: 8"	Carbon Steel
4.3.3	Control Valves	4	IR TORQUE S.P.A., MODEL: AT551S08, SIZE: 4"	Carbon Steel
4.3.4	Control Valves	2	MORIN BIRMINGHAM, MODEL: C-210U-D000-JSO	Carbon Steel
4.3.5	Control Valves	2	DAVIS PNEUMATIC SYS. LTD, Power Cylinder, MS 63 x 150	Carbon Steel
4.3.6	Control Valves	2	BLAKEBOROUGH, BV500/AA21FKD, 4"	Carbon Steel
4.3.7	Control Valves	2	AIR TORQUE S.P.A., MODEL: AT 451S07, SIZE: 6"	Carbon Steel
4.3.8	Positioners	18	Single acting , type: tzid-c with pressure gauge block, abb.	Aluminum Alloys
4.3.9	Solenoid Valve	4	IMI NORGREN, AA332, 0-25 Bar	Aluminum Alloys
4.3.10	Pressure transmitter	36	ABB ASD800 -100 - +250 Kpa (1A) ABB 2600T -100 - 3000 Kpa (1B)	Aluminum Alloys
4.3.11	Level transmitter	8	ABB ASK800 -400 - +400 Kpa	Aluminum Alloys
4.3.12	Flow Transmitter	24	ABB ASK800 -400 - +400 Kpa	Aluminum Alloys
4.3.13	Level Switches	10	Officine orobiche, type 41c a. 2.m2.	Aluminum Alloys
4.3.14	Pressure Switches	11	Delta	Aluminum Alloys
4.3.15	Annubars	2	Annubar, MODEL:585SLF3000HH	Stainless Steel
4.3.16	Annubars	2	ANNUBAR, TYPE: DCR-46M-HP2M- CP25- MPDS-MSDSW	Stainless Steel
4.3.17	Annubars	2	Multihole Pitot For Brine & Sea Water Annubar Service	Stainless Steel
4.3.18	Pressure Gauges	26	NUOVA FIMA MP2	Stainless Steel
4.3.19	Temperature Gauges	58	Wika en-13190	Stainless Steel
4.3.20	Temperature Elements & Transmitter	138	ABB TTH200E1 HBSEM (TX), APRIRE SOTTO TENSIONE TYPE GUJP(RTD), Thermowell	Aluminum Alloys
4.3.21	Junction Box	26	PITCO ROMNA	Carbon Steel
4.3.22	Instrument Tube	51	Stainless steel, 316L,Type: Seamless, 6 mm	Stainless Steel
4.3.23	Instrument Tube	163	Stainless steel, 316L,Type: Seamless, 12 mm	Stainless Steel

5. Phase-III Distiller 2, 3 & 4



- **Manufacturer : ITALIMPIANTI, GENOVA**
- **No. OF UNITS : 3**
- **OUTPUT : 5 MGD , at TBT 90°C**
: 6.1 MGD , at TBT 110
- **No. of Stages : 21**
- **Type : MSF**

5.1. Phase-III Distiller 2, 3 & 4 - Mechanical Parts:

No	Item/Equipment / Classification	Photo/ Drawing	Q	Description	Major Material
5.1.1	Brine Heater		3	No of Tube Passes: 1 Total Tubes: 3811 Tube Length: 14300 mm Shell Diameter: 2.8 m Shell Material: Carbon steel, Cladded with Cu90Ni10 Tube Sheets: Naval Brass, 85mm Thickness Tube Material: Cu70Ni30	Carbon steel Cu90Ni10 Cu70Ni30
5.1.2	Recovery Stages (1-18)		54	No of Stages: 18 Per Distiller Total Tubes per Stage: 3812 Tube Length: 13600 mm Tube Material: Cu70Ni30 (Stages 1-4) / Cu90Ni10 (Stages 5-18) Tube Sheets: Naval Brass, 45mm Thickness Tube Support Plates: Cu90Ni10, 10mm Thickness Shell and Water Boxes: Carbon steel, Cu90Ni10 (Cladded) Distillate Trays & Channels: Cu90Ni10	Cu70Ni30 Cu90Ni10 Naval Brass
5.1.3	Reject Stages (19-21)		9	No of Stages: 3 Per Distiller Total Tubes per Stage: 3315 Tube Length: 13600 mm Tube Material: Cu70Ni30 Tube Sheets: Naval Brass, 45mm Thickness Tube Support Plates: Cu90Ni10, 10mm Thickness Shell and Water Boxes: Carbon steel, Cu90Ni10 (Cladded) Distillate Trays & Channels: Cu90Ni10 Shell Material:	Cu70Ni30 Cu90Ni10 Naval Brass
5.1.4	Deaerator		3	Dimensions: Height mm, Length mm, Width mm Internal Material: AISI 316	Carbon Steel AISI 316
5.1.5	Seawater Supply pump		3	MFR: Termomeccanica, Type: Double suction, Centrifugal Pump Speed: 595 RPM Capacity: 11,700 m3/h at 35.5 m Head Shaft Material: Monel k-500 Casing Material: GGG-NiCrNb 20.2 Impeller Material: ASTM A743	Monel k-500 NiCrNb 20.2 ASTM A743

5.1.6 Seawater Sump pump



3

MFR: Termomeccanica
Type: Single stage, Centrifugal Pump
Speed: 2900 RPM
Capacity: 30 m³/h at 12 m Head
Shaft Material: Monel
Casing Material: SS316L
Impeller Material: SS316L

Monel
SS316L

5.1.7 Brine recirculation pump



4

MFR: Termomeccanica
Type: Double suction, Centrifugal Pump
Speed: 595 RPM
Capacity: 11,500 m³/h at 8bar
Shaft Material: Monel k-500
Casing Material: GGG-NiCrNb 20.2
Impeller Material: SS 316L

Monel k-500
NiCrNb 20.2
SS316L





5.1.8 Brine Blowdown pump



6

MFR: Termomeccanica
Type: Double suction, Centrifugal Pump
Speed: 595 RPM
Capacity: 2580 m³/h at 14.6m Head
Shaft Material: Monel k-500
Casing Material: GGG-NiCrNb 20.2
Impeller Material: SS 316L

Monel k-500
NiCrNb 20.2
SS316L

<p>5.1.9</p> <p>High Purity Distillate Pumps</p>		<p>6</p> <p>MFR: Termomeccanica Type: Single stage, Centrifugal Pump Speed: 2900 RPM Capacity: 24.2 m3/h at 28 m Head</p>	<p>AISI 316L Monel k-500</p>
<p>5.1.10</p> <p>Product Distillate Pumps</p>		<p>6</p> <p>MFR: Termomeccanica Type: Double suction, single stage, Centrifugal Pump Speed: 985 RPM Capacity: 1320 m3/h at 36 m Head</p>	<p>AISI 316L Monel k-500</p>
<p>5.1.11</p> <p>Acid Dosing, Anti-scale, Anti-foam, Sodium sulfite, Caustic soda Pumps</p>		<p>24</p> <p>MFR: TURO, Type: single stage, Centrifugal Pump, Speed: 2900 RPM Capacity: 15 m3/h at 21.5 m Head 10 bar</p>	<p>AISI 316</p>
<p>5.1.12</p> <p>Stages Demisters</p>		<p>Demister Specific Area Per Distiller: 360 m2 /m3 Demister Thickness: 100 mm Material: Monel 400</p>	
<p>5.1.13</p> <p>Vacuum System: Pre-condenser</p>		<p>3</p> <p>MFR: AB PROGETTI Height: 5.8 m Diameter: 1.84 m Weight: 4500 kg (As Built Drawing)</p>	<p>AISI 316L</p>

Design Pressure & Temp: 1.5 bar Full Vacuum & 250 °C

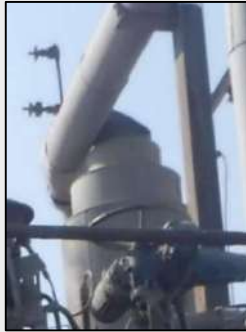
5.1.14 Vacuum System:
Hogging Ejector

3

MFR: AB PROGETTI
Height: 3.089 m
Nozzle Diameter: 19 mm
Weight: 170 kg (As Built Drawing)
Design Pressure Suction: 5 barg
Design Temperature: 250 °C
Evacuation Volume: 3700 m3/h

AISI 316L

5.1.15 Vacuum System:
Silencer



3

MFR: AB PROGETTI
Height: 2.5 m
Diameter: 1.84 m
Weight: 270 kg (As Built Drawing)
Design Temperature: 250 °C

AISI 316L

5.1.16 Vacuum System:
1st Stage Ejector

3

MFR: AB PROGETTI
Length: 3.294 m, Nozzle Diameter: 11 mm
Weight: 250 kg (As Built Drawing)
Design Pressure Suction: 5 barg, Suc. Pressure: 0.065 bar
Design Temperature: 250 °C
Motive Steam Flow Rate: 656 kg/h

AISI 316L

5.1.17 Vacuum System:
2nd Stage Ejector

3

MFR: AB PROGETTI
Length: 1.697 m
Nozzle Diameter: 10.2 mm
Weight: 150 kg (As Built Drawing)
Design Pressure Suction: 5 barg
Suction Pressure: 0.137 bar
Design Temperature: 250 °C
Motive Steam Flow Rate: 550 kg/h

AISI 316L

5.1.18 Vacuum System:
3rd Stage Ejector


3

MFR: AB PROGETTI
Length: 3.294 m
Nozzle Diameter: 12 mm
Weight: 80 kg (As Built Drawing)

AISI 316L

			Design Pressure Suction: 5 barg Suction Pressure: 0.42 bar Design Temperature: 250 °C Motive Steam Flow Rate: 788 kg/h MFR: AB PROGETTI Height: 3.75 m Diameter: 1.1 m	
5.1.19	1st Inter-condenser	3	Weight: 1,600 kg (As Built Drawing) Design Pressure: 5 barg Design Temperature: 250 °C Cooling Water Flowrate: 150 t/h MFR: AB PROGETTI Height: 3.25 m Diameter: 0.96 m	AISI 316L
5.1.20	2nd Inter-condenser	3	Weight: 1,200 kg (As Built Drawing) Design Pressure: 5 barg Design Temperature: 250 °C Cooling Water Flowrate: 130 t/h MFR: AB PROGETTI Height: 2.4 m Diameter: 0.51 m	AISI 316L
5.1.21	After-condenser	3	Weight: 500 kg (As Built Drawing) Design Pressure: 5 barg Design Temperature: 250 °C Cooling Water Flowrate: 35 t/h	AISI 316L
5.1.22	Ant scale Tank	3	MFR: TUBITAL Capacity: 10,000 liters Working Temperature: 35 °C Weight: 1,770 kg (As Built Drawing)	AISI 316L



<p>5.1.23</p> <p>Brine Temperature Control Valve</p>		<p>3</p> <p>MFR: NELES Fluid: Steam Maximum Flow Rate: 155 t/h at 0.5 - 0.7 bar Normal Flow Rate: 115 t/h at 1.4 – 1.65 bar Minimum Flow Rate: 70 t/h at 1.4 – 1.65 bar Maximum Steam Temperature: 146 °C</p>	<p>AISI 316</p>
<p>5.1.24</p> <p>Condensate Pumps</p>		<p>6</p> <p>MFR: Termomeccanica Type: two stage, Centrifugal Pump Speed: 1475 RPM Capacity: 160 m3/h at 70 m Head</p>	<p>AISI 316L</p>
<p>5.1.25</p> <p>H.P Distillate Cooler</p>		<p>3</p> <p>MFR: COSMIN – TEMA A.E.S Design Pressure: 6 barg Tube Bundle Weight: 970 kg (As Built Drawings) Total Weight: 2700 kg (As Built Drawings) No. of Tubes: 276 Tube Bore / Thickness: 23.7 mm / 1.2 mm Tube Length: 2536 mm Shell Material: SS 316L Tube Material: Cu70Ni30 Tube Sheet Material: Naval Brass</p>	<p>SS 316L Cu70Ni30 Naval Brass</p>
<p>5.1.26</p> <p>Steam Pressure Control Valve</p>		<p>3</p> <p>MFR: NUOVO – 1200 Fluid: Steam Maximum Flow Rate: 1.8 t/h at 42.2 bar Normal Flow Rate: 1.6 t/h at 42.2 bar Maximum Steam Temperature: 500 °C</p>	<p>ASTM A351</p>
<p>5.1.27</p> <p>Steam Temperature Control Valve</p>		<p>3</p> <p>MFR: NUOVO – 1200 Fluid: Water Maximum Flow Rate: 600 kg/h at 20 bar Normal Flow Rate: 400 kg/h at 20 bar</p>	<p>ASTM A216</p>

Maximum Steam Temperature: 40 - 116 °C

5.1.28 Sump Pit Drain Pump

1 MFR: Termomeccanica
Type: Single stage, Centrifugal Pump
Speed: 1450 RPM
Capacity: 5 m³/h at 15m Head
Driven: by Electrical Motor 7.5 KW of Power

Carbon Steel

5.1.29 Instrument Air Compressor (A)



1 MFR: KAESER
Type: BSD 81
Capacity: 6.8 m³/min.

Steel/Copper

5.1.30 Instrument Air Compressor (B)



1 MFR: KAESER
Type: CSG 130 -2A.
Capacity: 12.8 m³/min.

Steel/Copper

5.1.31 Service Air Compressor (A)



1 MFR: KAESER
Type: BSD 81
Capacity: 6.8 m3/min

Steel/Copper

5.1.32 Service Air Compressor (B)



1 MFR: ELGI
Type: E37-10.
Capacity: 5.38 m3/min

Steel/Copper

5.1.33 Air Dryer



1 MFR: Ingersoll Rand
Type: D950IN-A.
Capacity: 15.833 m3/min.

Steel/Copper

5.1.34 Air Dryer



1

MFR: KAESER
Type: TF 230
Capacity: 34 m3/min

Steel/Copper

Phase-III Distiller 2, 3 & 4 - Mechanical Spare Parts:

5.1.35 Brine recirculation pump (Spare)



1

Removed from Phas- III Distillers in 2020 & kept between Distillers for Major Overhauling
MFR: Termomeccanica
Type: Double suction, Centrifugal Pump
Speed: 595 RPM
Capacity: 11,500 m3/h at 8bar
Shaft Material: Monel k-500
Casing Material: GGG-NiCrNb 20.2
Impeller Material: SS 316L
Overhauled and ready to be installed

Monel k-500
NiCrNb 20.2
SS316L

5.1.36

Brine Recirculating Pump Thrust Bearing Frame (Spare)



1

Thrust Bearing Frame (the thrust pads are not included)

Steel

5.1.37 Distiller 2, 3, 4
Tubes in Box#1



43

Copper Nickle (CuNi 70/30) tubes collected in box#1 and kept opposite to Distiller 4
Tube length: 14 m
Tube Diameter: 26 mm
Tube Thickness: 2.3 mm

Copper Nickle
(CuNi 70/30)

5.1.38 Distiller 2, 3, 4
Tubes in Box#2 &
Box#3



493

The boxes kept beside L.P header in the area between Dist.5 & GT-5
Box #2 contains 135 tubes
Box #3 contains 358 tubes
Tube length: 14 m
Tube Diameter: 26 mm
Tube Thickness: 2.3 mm

Copper Nickle
(CuNi 70/30)

5.1.39 Distiller 2, 3, 4
Tubes in Box#4



175

Copper Nickle (CuNi 70/30) tubes collected in box#4 and kept beside GT 5 opposite to Auxiliary Boiler
Tube length: 14 m
Tube Diameter: 26 mm
Tube Thickness: 2.3 mm

Copper Nickle
(CuNi 70/30)

5.2. Phase-III Distiller 2, 3 & 4 - Electrical Parts:

No	Item/Equipment / Classification	Photo/ Drawing	Q	Description	Major Material
5.2.1	Sump Pump motor		3	Frame size: 132, 415V, 5.5 KW, 2930 RPM, Total weight: 59 KG	Copper/Steel
5.2.2	Anti-Scale(New) Pump motor		2	Frame size: BN90S4, 415V, 1.1KW, 1400 RPM, Total weight: 9 KG	Copper/Steel
5.2.3	Anti-Scale pump motor		6	Frame size: 90L415V,3.5 KW, 1420 RPM, Total weight: 16 KG	Copper/Steel
5.2.4	Sodium Sulphite pump motor		6	Frame size: 80K4, 415V, 0.55 KW, 1405 RPM, Total weight: 7.5 KG	Copper/Steel

5.2.5	Anti-Foam pump motor	6	Frame size: 80B4, 415V, 3.2 KW, 1400 RPM, Total weight: 39 KG	Copper/Steel
5.2.6	Acid Cleaning Pump motor	9	Frame size: 132, 415V, 5.5 KW, 2930 RPM, Total weight: 59 KG	Copper/Steel
5.2.7	Caustic Soda Pump motor	4	Frame size: 80B4, 415V, 3.2 KW, 1400 RPM, Total weight: 50 KG	Copper/Steel
5.2.8	Sodium Sulphite mixer motor	6	Frame size: 90L4, 415V, 1.5 KW, 1400 RPM, Total weight: 8.3 KG	Copper/Steel
5.2.9	Anti-Foam mixer motor	3	Frame size: 80B4, 415V, 0.5 KW, 1400 RPM, Total weight: 7.5	Copper/Steel
5.2.10	Caustic Soda Mixer motor	2	Frame size: 100LA4, 415V, 2.2 KW, 1400 RPM, Total weight: 35 KG	Copper/Steel
5.2.11	Anti-Scale Mixer motor	6	Frame size: 100LA4, 415V, 2.2 KW, 1420 RPM, Total weight: 35 KG	Copper/Steel
5.2.12	(HP) High Purity pump motor	6	Frame size: DM1 132 S2, 415V, 5.5 KW, 2920 RPM, Total weight: 59 KG	Copper/Steel
5.2.13	Taprogge Motor	3	Frame size: N6 112 M, 415V, 4 KW, 1445 RPM, Total weight: 40 KG	Copper/Steel
5.2.14	De-supper Heater	6	Frame size: N6 112 M, 415V, 4 KW, 1435 RPM, Total weight: 45 KG	Copper/Steel
5.2.15	Condensate pump Motor	6	Frame size: 250 M/4, 415V, 55KW, 1485 RPM, Total weight: 650 KG	Copper/Steel
5.2.16	Distillate pump Motor (6 on Service + 1 Spare)	7	Frame size: CT 315x6, 3.3KV, 165 KW, 986 RPM, Total weight: 1670 KG	Copper/Steel
5.2.17	Blow Down Pump Motor (6 on Service + 1 Spare)	7	Frame size: CT 40 w/0, 3.3KV, 135 KW, 591 RPM Total weight: 2560 KG	Copper/Steel
5.2.18	Brine Pump Motor (3 on Service + 1 Spare)	4	Frame size: CTV 900Y10, 3.3 KV, 3850 KW, 595 RPM Total weight: 23220 KG	Copper/Steel
5.2.19	Sea Water Supply pump Motor (3 on Service + 1 Spare)	4	Frame size: CT630Z10, 3.3KV, 1550 KW, 592 RPM Total weight: 11510 KG	Copper/Steel
5.2.20	Sea water Pit sump pump Motor	2	Frame size:---, 415V, --KW, RPM, Total weight:--	Copper/Steel
2.2.21	Taprogge two way valve actuator	3	Frame size: SD00063-4-0.04415V0.041400RPM25	Copper/Steel
5.2.22	Taprogge Three way valve actuator	3	Frame size: SD00063-4-0.04415V0.041400RPM25	Copper/Steel
5.2.23	Ball Catching valve	3	Frame size: SD00063-4-0.04415V0.041400RPM37	Copper/Steel
5.2.24	Sea Water to Reject v/v actuator	3	Frame size: X,415V, --KW, -- RPM, Total weight: 37 KG	Copper/Steel
5.2.25	Section Valve actuator	3	Frame size: L10A1008/1C11050415V, --KW, --RPM, Total weight: 37 KG	Copper/Steel
5.2.26	Taprogge Screen Valve actuator	3	Frame size: X,415V, --KW, -- RPM, Total weight: 37 KG	Copper/Steel
5.2.27	Main Steam Valve actuator	6	Frame size: X,415V, --KW, -- RPM, Total weight: 37 KG	Copper/Steel
5.2.28	Steam Ejector to hogger V/V actuator	3	Frame size: X,415V, --KW, -- RPM, Total weight: 37 KG	Copper/Steel
5.2.29	Sea Water Inlet valve actuator	6	Frame size: X,415V, --KW, -- RPM, Total weight: 215 KG	Copper/Steel
5.2.30	Sea Water Outlet Valve actuator	6	Frame size: X,415V, --KW, -- RPM, Total weight: 37 KG	Copper/Steel
5.2.31	Instrument Air Compressor motor	1	Frame size: 250M40012B35, 415V, 55 KW, 1485RPM, Total weight: 533 KG	Copper/Steel
5.2.32	Instrument Air Compressor FAN motor	1	Frame size: LSE-100LR, 415V, 2.2 KW, 1450RPM, Total weight: 25 KG	Copper/Steel
5.2.33	Service Air Compressor motor	1	Frame size: ILG6-200A-2AA96-2, 415V, 45 KW, 3000 RPM, Total weight: 280 KG	Copper/Steel
5.2.36	Service Air Compressor FAN motor	1	Frame size: Y2-90S-4, 415V, 1.1 KW, 13090 RPM, Total weight:25 KG	Copper/Steel

5.2.37	Instrument Air Compressor motor	1	Frame size: 20080MIMB35, 415V, 90 KW, 2980 RPM, Total weight: 640 KG	Copper/Steel
5.2.38	Instrument Air Compressor FAN motor	1	Frame size: LSE-100LR, 415V, 2.2 KW, 1450 RPM, Total weight: 25 KG	Copper/Steel
5.2.39	service Air Compressor motor	1	Frame size: 200L, 415V, 44.7 KW, 2965RPM, Total weight: 400 KG	Copper/Steel
5.2.40	service Air Compressor FAN motor	1	Frame size: Y2-90S-4, 415V, 1.1 KW, 13090 RPM, Total weight:25 KG	Copper/Steel
5.3. Phase-III Distiller 2, 3 & 4 - Instrumentation Parts:				
5.3.1	Control Valves	3	Nuovo Pignone, Type 1000, Size: 3", ANSI 150-RF	Austenitic Stainless
5.3.2	Control Valves	9	Nuovo Pignone, Type 1200, Size: 2", ANSI 150-RF	Austenitic Stainless
5.3.3	Control Valves	9	Nuovo Pignone, Type 1000, Size: 6", ANSI 150-RF	Carbon Steel
5.3.4	Control Valves	3	VANESSA, 33.000 Series Butterfly Control Valve ND 400 ANSI 150 RF Operated By SE ALGAS 0.4/300-CL Pneumatic Actuator	Carbon Steel
5.3.5	Control Valves	3	VANESSA, 33.000 Series Butterfly Control Valve ND 200 ANSI 150 RF Operated By SE ALGAS 0.2/175-OP Pneumatic Actuator	Carbon Steel
5.3.6	Control Valves	3	VANESSA, 41.000 Series Butterfly Control Valve ND 900 NP 16 Operated By DE ALGAS 5/535-M200 Pneumatic Actuator	Carbon Steel
5.3.7	Control Valves	3	VANESSA, 41.000 Series Butterfly Control Valve ND 700 NP 10 Operated By DE ALGAS 1/335-M175 Pneumatic Actuator	Carbon Steel
5.3.8	Control Valves	6	VANESSA, 41.000 Series Butterfly Control Valve ND 250 ANSI 150 RF Operated By SE ALGAS 0.2/200-CL Pneumatic Actuator	Carbon Steel
5.3.9	Control Valves	3	VANESSA, 33.000 Series Butterfly Control Valve ND 500 ANSI 150 RF Operated By SE ALGAS 0.7/385-CL Pneumatic Actuator	Carbon Steel
5.3.10	Control Valves	3	Neles Ball, Type: BJRY32	Carbon Steel
5.3.11	Control Valves	18	COLLAR, ELASTIC ITEM: 47 OF STI DRG: 23 DOUBLE ACTING POSITIONER FOR DOSING PUMP CONTROL TYPE: AM/C MFR: STRUMENTAZIONE INDUSTRIALE , ITALY	Carbon Steel
5.3.12	Control Valves	3	Neles Ball, Type: BJRY3	Carbon Steel
5.3.13	ON/OFF Valves	6	VANESSA, 33.000 Series Butterfly Control Valve ND 450 ANSI 150 RF Operated By SE ALGAS 0.7/385-OP Pneumatic Actuator	Carbon Steel
5.3.14	ON/OFF Valves	3	Nuovo Pignone, Type 1200, Size: 1", ANSI 130-RF	Austenitic Stainless
5.3.15	ON/OFF Valves	3	BOURDON STDEME MIX7 316 SS	Carbon Steel
5.3.16	Pressure transmitters	27	ABB 266HSH MKBA7	Aluminum Alloy
5.3.17	Level transmitters	15	ABB CODE: 26DSHESB2J7 LSRIB4I2H3	Aluminum Alloy
5.3.18	Flow Transmitters	24	KRONE, ALTOMETER, Magnetic Ind ALTOFLUX PRIMARY IFS 5000	Stainless Steel
5.3.19	Flow switches	6	OFFICINE OROBICHE ITALY module CVM25,MO,WPX,TYPE S	Aluminum Alloy
5.3.20	Level Switches	18	OFFICINE OROBICHE ITALY series 50 - CA/2546/31	Aluminum Alloy

5.3.21	Level Switches	42	COLIMA ,ITALY Visco 54 Dis NO : 50 - 1071	Stainless Steel
5.3.22	Temperature Switches	6	TERMAN MILANO	Stainless Steel
5.3.23	Temperature Switches	3	ACCURATE CONTROLS LTD,MODEL NO.A131	Stainless Steel
5.3.24	Temperature Switches	3	SECUTHERM BIT. Pat 1551956 ,Spannung bis 380v	Stainless Steel
5.3.25	Annubars	12	TORBAR S/NO: 31252	Stainless Steel
5.3.26	Flow Indicators	12	ABB purgemaster a623kn4baa044s	Stainless Steel
5.3.27	Pressure Gauges	39	NUOVA FIMA MP2	Stainless Steel
5.3.28	Temperature Gauges	57	Wika en-13190	Stainless Steel
5.3.29	Temperature Elements	6	Michell Bearing ENGLAND Type : NE156LL	Stainless Steel
5.3.30	Temperature Elements	30	APRIRE SOTTO TENSIONE TYPE GUJP	Stainless Steel
5.3.31	Level Indicators	18	COLIMA ,ITALY visco 54 Dis NO : 50 - 1071	Stainless Steel
5.3.32	Junction Box	18	PITCO ROMNA ITALY Q16	Stainless Steel
5.3.33	Vibration Pickups	3	SCHENCK VC - 1000 CV - 116,sensor:B&K Vibro type VS -068	Stainless Steel
5.3.34	Instrument Tube	1466.5	STAINLESS STEEL, 316L,TYPE: SEAMLESS, 10MM/12MM	Stainless Steel
5.3.35	Instrument Cables	1992	13 Pairs (Dist. 2,3&4)	Copper
5.3.36	Instrument Cables	1992	13 Pairs (Dist. 2,3&4)	Copper

6. Phase-II Distiller 5



- **Manufacturer : ITALIMPIANTI, GENOVA**
- **No. OF UNITS : 1**
- **OUTPUT : 5 MGP, at TBT 90°C**
- **No. of Stages: 16**
- **Type : MSF**

6.1. Phase-II Distiller 5 - Mechanical Parts:


No	Item/Equipment / Classification	Photo/ Drawing	Q	Description	Major Material
6.1.1	Seawater Supply pump		1	MFR: Termomeccanica, Type: Semi axial, Centrifugal Pump Speed: 596 RPM Capacity: 13,450 m ³ /h at 28 m Head Shaft Material: Monel k-500 Casing Material: GGG-NiCrNb 20.2 Impeller Material: ASTM A743	<i>Monel k-500</i> <i>NiCrNb 20.2</i> <i>ASTM A743</i>
6.1.2	Sea water lubricating pump		1	MFR: Termomeccanica Type: Double impeller, Centrifugal Pump Speed: 1450 RPM Capacity: 10 m ³ /h at 30 m Head, Driver: Electrical Motor 22KW of Power	Carbon Steel
6.1.3	Brine recirculation pump		2	MFR: Termomeccanica Type: Double impeller, semi axial, Centrifugal Pump Speed: 600 RPM Capacity: 14,400 m ³ /h at 63m Head Driver: Steam Turbine 630 RPM, Power output 3050KW	Carbon Steel
6.1.4	Distillate Water System		2	MFR: Termomeccanica Type: Double impeller, single stage, Centrifugal Pump Speed: 1485 RPM Capacity: 950 m ³ /h at 39m Head Driver: Electrical Motor 160KW of Power	Carbon Steel
6.1.5	Brine heater Condensate Pumps		2	MFR: Termomeccanica Type: Vertical axis, Centrifugal Pump Speed: 1500 RPM Capacity: 184 m ³ /h at 46m Head Driver: Electrical Motor 45KW of Power	Carbon Steel
6.1.6	Recirculation pump		1	MFR: Turo Type: Single stage, Centrifugal Pump Speed: 970 RPM Capacity: 1900 m ³ /h at 15m Head Driver: Electrical Motor 132KW of Power	Carbon Steel

6.1.7	Deaerator Sampling Pump	1	MFR: Cucchi Pompe Type: MBM – NX2/C Speed: 1450 RPM Capacity: 13,450 m ³ /h at 150 m Head Major Material: SS AISI 316	<i>AISI 316</i>
6.1.8	Vent Condenser		Type: Single Pass Surface Condenser No of Tubs: 335 Tubes Size (OD) in mm: 19.05 Tube Wall Thickness in mm: 0.611 mm Heat Exchange Surface Area: 283m ² Tube Bundle Diameter: 472mm Tube Design pressure: 2.94 bar Tube test pressure barg: 4.41 Shell Plate: SS ASTM A240 TP 316L Tube Plate: Aluminum Nickel Bronze ASTM B171 C630 Water Boxes: Cu90Ni10	<i>Cu90Ni10</i>
6.1.9	Evaporator Heat Recover Stage (1-13)		No of Stages: 13 Tube Bundle Diameter: 2110 Total Tubes each bundle: 2364 Tube Length: 14.50 m Tube Material: Cu90Ni10 (Stages 1-3)- Al-brass (Stages 4-13) Tube Sheets: Naval Brass, 1.2m Thickness Shell and Water Boxes: Carbon steel, Cu90Ni10 (Cladded)	<i>Cu90Ni10</i>
6.1.10	Evaporator Heat Rejection Stage (Stages 14-16)		No of Stages: 3 Tube Bundle Diameter: 2116 Total Tubes each bundle: 2158 Tube Length: 14.50 m Tube Material: Cu70Ni30 Tube Sheets: Naval Brass, 1.2m Thickness Shell and Water Boxes: Carbon steel, Cu90Ni10 (Cladded)	<i>Cu90Ni10</i> <i>Al-brass</i>
6.1.11	Shell: stages 1-3		Cladding Thickness: 3 mm Cladding Material: Cu90Ni10 Whole internal surfaces: A STM B402 C706	<i>Cu90Ni10</i>

6.1.12	Tube Plates	Tube plates: Solid naval brass ASTM B171 C464 Tube support plates: stages 1-2-3 : CuNi 90/10 Tube support plates: stages 4-16 : SS ASTM A240 TP 304L Water boxes and connecting pipes : CuNi 90/10	<i>Cu90Ni10</i>
6.1.13	Distillate trays: stages 1-2-3	Brine side: CuNi 90/10 Distillate side : SS ASTM A240 TP316L	<i>Cu90Ni10</i>
6.1.14	Brine heater	Type - No. of passes: Horizontal – Single pass No. of tubes: 2264 Tube size (OD): 31.75 mm Tube wall thickness: 1.22 mm Tube length: 17.20 m Tube Material: Cu70Ni30 Tube plates: Cu70Ni30 Water boxes: Fe 410.1 internally clad with Cu90Ni10 Shell: 14 mm Tube plates: 98 mm Tube support plates : 16 mm Water boxes Cladding: 12+3 mm Expansion joint: 5 mm Impingement plate: 10 mm	<i>Cu70Ni30</i>
6.1.15	Deaerator	Shell Thickness: 10mm Seawater distribution pipe: MONEL 400 ASTM B127 Steam distribution pipe: SS ASTM A240 TP 316L Packing rings support : SS ASTM A240 TP 316L	<i>MONEL 400 ASTM B127</i>
6.1.16	Ejector Condensers	Tubes Material: Titanium (ASTM B 338 Gr. 2) Number of tubes: 952 Tube size (OD): 19.05 mm Tube wall thickness: 0.89 mm Tube length: 4.115m Heat exchange surface area: 230 m ² Tube bundle diameter: 850mm Shell plate: ASTM B 169 Alloy 614 Tube plate: ASTM B 171 Alloy 614 Support plates & Water Boxes : ASTM B 169 Alloy 614	Titanium (ASTM B 338 Gr. 2)

6.1.17	Post condenser			<p>Tubes Material: Titanium (ASTM B 338 Gr. 2) Number of tubes: 476 Tube size (OD): 19.05 mm Tube wall thickness: 0.89 mm Tube length: 1.136m Heat exchange surface area: 30 m² Tube bundle diameter: 470 mm Shell plate: ASTM B 169 Alloy 614 Tube plate: ASTM B 171 Alloy 614 Support plates & Water Boxes : ASTM B 169 Alloy 614</p>	Titanium (ASTM B 338 Gr. 2)
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Phase-II Distiller 5 – Mechanical Main Spare Parts:

6.1.18	Brine recirculation pump		1	<p>Kept beside Distiller 5 for major Overhauling MFR: Termomeccanica Type: Double impeller, semi axial, Centrifugal Pump Speed: 600 RPM Capacity: 14,400 m³/h at 63m Head Driver: Steam Turbine 630 RPM, Power output 3050KW</p>	Carbon Steel
6.1.19	Brine Recirculating Pump Thrust Bearing Frame		1	<p>Kept beside Distiller 5 for major Overhauling MFR: Termomeccanica Italiana</p>	Carbon Steel
6.1.20	Steam Turbine (The Driver of Distiller 5 Brine Recirculating Pump) Along with Gear Box		1	<p>Kept beside Distiller 5 for major Overhauling MFR: KKK Type: Steam Turbine RPM: 630 RPM Power output: 3050 KW</p>	Steel

6.2. Phase-II Distiller 5 - Electrical Parts:

No	Item/Equipment / Classification	Photo/ Drawing	Q	Description	Major Material
6.2.1	Ejector condensate motor		2	Frame size:100L, 415V, 2.5KW, 2875 RPM, Total weight: 19 Kg	Copper/Steel
6.2.2	Chemical Sump Pump motor		1	Frame size:90L, 415V, 2.2 KW, 1400 RPM, Total weight:16 Kg	Copper/Steel
6.2.3	Acid Motor		2	Frame size: 315M, 415V, 120 KW, 990 RPM, Total weight: 885 Kg	Copper/Steel
6.2.4	Sea Water Resolution motor		1	Frame size: 315M, 415V, 120 KW, 990 RPM, Total weight: 885 Kg	Copper/Steel
6.2.5	Anti-Scale motor		2	Frame size: 80NR, 415V, 0.55 KW, 1380 RPM, Total weight: 7.5 Kg	Copper/Steel
6.2.6	Sodium Sulphite motor		2	Frame size: 80NR, 415V, 0.55 KW, 1380 RPM, Total weight: 7.5 Kg	Copper/Steel
6.2.7	Anti-Foam motor		2	Frame size: 80NR, 415V, 0.55 KW, 1380 RPM, Total weight: 7.5 Kg	Copper/Steel
6.2.8	Taprogge motor		1	Frame size: 112M, 415V, 4 KW, 1450 RPM, Total weight: 45 Kg	Copper/Steel
6.2.9	Condensate pump motor		2	Frame size: KA3 250M, 415V, 50 KW, 1470 RPM, Total weight: 550 Kg	Copper/Steel
6.2.10	Distillate pump motor (2 on Service + 1 Spare)		3	Frame size: QUVx355Pb4, 3.3kV, 160 KW, 1488 RPM, Total weight: 1650 Kg	Copper/Steel
6.2.11	Sea Water Supply Pump motor (2 on Service + 1 Spare)		3	Frame size: QRNVXY900-qb10, 3.3kV, 1400 KW, 595 RPM: Total weight: 10500 Kg	Copper/Steel
6.2.12	Service Water Pump Motor		2	Frame size: 132S, 415V, 4.58KW, 2930 RPM, Total weight: 10500 Kg	Copper/Steel
6.2.13	Screen Wash Pump motor		2	Frame size: 200L4, 415V, 22 KW, 1485 RPM, Total weight: 159 Kg	Copper/Steel
6.2.14	Aux Oil pump motor		1	Frame size: S200, 415V, 5 KW, 1500 RPM, Total weight: 55 Kg	Copper/Steel
6.2.15	Ejector Condensate Valve actuator		2	Frame size: 05D 0404/55-20, 415V, 1.7 KW, 20 RPM, Total weight: 110 Kg	Copper/Steel
6.2.16	Last Value Vacuum Valve actuator		1	Frame size: 05C 040 /28-70, 415V, 0.2 KW, 70 RPM, Total weight: 55 Kg	Copper/Steel
6.2.17	Vacuum Valve actuator		6	Frame size: 05D 0404/55-20, 415V, 0.1 KW, 20 RPM, Total weight: 26 Kg	Copper/Steel

6.2.18	Last Stage Valve actuator	3	Frame size: 1x 060 70-48, 415kV, 0.1 KW, 48 RPM, Total weight: 26 Kg	Copper/Steel
6.2.19	Last Stage Valve actuator	1	Frame size: A/A2541-2, 415V, 0.1 KW, 24 RPM, Total weight: 75 Kg	Copper/Steel
6.2.20	Sea Water Recirculation tank Valve actuator	4	Frame size : ..., 415V, 0.2 KW, RPM, Total weight: 55 Kg	Copper/Steel
6.2.21	Taprogge System Valve	4	Frame size: ..., 415V, 0.25 KW, RPM, Total weight: 37 Kg	Copper/Steel
6.2.22	Acid Cleaning Valve actuator	2	Frame size: A/A2532-4, 415V, 0.75 KW, 36 RPM, Total weight: 55 Kg	Copper/Steel
6.2.23	chemicals dosing Valve actuator	13	Frame size: ANS 1150, 415V, 0.2 KW, 20 RPM, Total weight: 55 Kg	Copper/Steel
6.2.24	Condensate pump valve actuator	2	Frame size: 2C220/250-48, 415V, 0.25 KW, 48 RPM, Total weight: 55 Kg	Copper/Steel
6.2.25	Condensate pump section Valve actuator	2	Frame size: 1C 060/70-48, 415V, 0.5 KW, 48 RPM, Total weight: 75 Kg	Copper/Steel
6.2.26	Condensate valve actuator	3	Frame size: 1C 060/70-48, 415V, 0.1 KW, 48 RPM, Total weight: 43 Kg	Copper/Steel
6.2.27	Distillate Valve actuator	8	Frame size: , 415V,0.1 KW, 24 RPM, Total weight: 55 Kg	Copper/Steel
6.2.28	Sea water Valve actuator	7	Frame size: SS2-11A, 415V, 0.2 KW, 24 RPM, Total weight: 50 Kg	Copper/Steel
6.2.29	Wash Pump Valve actuator	1	Frame size:, 415V, 0.1 KW, RPM, Total weight: 37 Kg	Copper/Steel
6.2.30	Make up Valve actuator	2	Frame size: , 415V, 0.75 KW, RPM, Total weight: 55 Kg	Copper/Steel
6.2.31	Second Stage Ejector Valve actuator	2	Frame size: 05C 040/28-70, 415V, 0.1 KW, 70 RPM, Total weight: 26 Kg	Copper/Steel
6.2.32	Vacuum vent valve actuator	2	Frame size: 05C 040/20, 415V, 0.1 KW, 20 RPM, Total weight: 26 Kg	Copper/Steel
6.2.33	outlet from stage 2 ejector Valve actuator	2	Frame size: ss2-74A, 415V, 0.7 KW, 36 RPM, Total weight: 55 Kg	Copper/Steel
6.2.34	Vacuum Vent valve actuator	3	Frame size: 05C 040/20, 415V, 0.1 KW, 20 RPM, Total weight: 45 Kg	Copper/Steel
6.2.35	First Stage Ejector Valve actuator	...	Frame size: BIA 7003-1, 415V, 0.7 KW, 36 RPM, Total weight: 55 Kg	Copper/Steel

6.2.36	Sea Water pump Inlet valve actuator	2	Frame size: ... , 415V, 1.5 KW, RPM, Total weight: 37 Kg	Copper/Steel
6.2.37	LP Steam Valve actuator	4	Frame size: ... , 415V, 1.7 KW, RPM, Total weight: 75 Kg	Copper/Steel
6.2.38	HP Steam ejector Valve actuator	3	Frame size: ... , 415V, 0.85 KW, RPM, Total weight: 49 Kg	Copper/Steel
6.2.39	HP Steam Valve actuator	2	Frame size: ... , 415V, 0.85 KW, RPM, Total weight: 40 Kg	Copper/Steel
6.2.40	Feed water Valve actuator	1	Frame size: ... , 415V, 0.2 KW, RPM, Total weight: 55 Kg	Copper/Steel
6.2.41	LP Steam Valve actuator	1	Frame size: ... , 415V, 1.7 KW, RPM, Total weight: 55 Kg	Copper/Steel
6.2.42	HP Steam Valve actuator	2	Frame size: ... , 415V, 0.85 KW, RPM, Total weight: 65 Kg	Copper/Steel
6.2.43	Condensate valve actuator	9	Frame size: ... , 415V, 0.1 KW, RPM, Total weight: 26 Kg	Copper/Steel
6.2.44	Condensate valve actuator	3	Frame size: ... , 415V, 0.1 KW, RPM, Total weight: 43 Kg	Copper/Steel
6.2.45	Gas station valve actuator	1	415V, 0.25 KW, Total weight: 37 Kg	Copper/Steel

6.3. Phase-I Distiller 5 - Instrumentation Parts:

6.3.1	Control Valve	4	Mfr.:Brown Boveri , ANSI 316	Carbon Steel
6.3.2	Control Valve	2	ANSI 300 RF	Carbon Steel
6.3.3	Control Valve	1	ANSI 150 RF	Carbon Steel
6.3.4	Control Valve	1	Mfr.: Shawa, ANSI.B16.5 PN 20 DN2632 SIZE: 700	Carbon Steel
6.3.5	Control Valve	1	C/V SIZE: 700, CONNECTION: DIN 2632 Mfr.: Shawa, PN 10	Carbon Steel
6.3.6	Control Valve	1	C/V SIZE: 500, CONNECTION: 816.5, DN 700 Mfr.: Shawa, DN0700. PN 10	Carbon Steel
6.3.7	Control Valve	1	C/V SIZE:600, CONNECTION: 816.5, Mfr.: Shawa, PN 20	Carbon Steel
6.3.8	Control Valve	2	Mfr.: Shawa, ANSI.B16.5 PN 20 DN150	Carbon Steel
6.3.9	Control Valve	1	Mfr.: Shawa, PN10 DiN 2632, DN 800	Carbon Steel
6.3.10	Control Valve	2	C/V, Mfr.: Shawa, CONNECTION: ANSI.B16.5 PN 20, DN 250,	Carbon Steel

6.3.11	Control Valve	3	Mfr: Parcol-Milano-Italy, double Acting Actuator type:100/600 PN6	Carbon Steel
6.3.12	Positioners	16	Mfr: SMC, Model: IP300.IP310, pipe conn: 1/4 inch , 1/8 inch gauge ports	Aluminum
6.3.13	Volume Boosters	9	Mfr: SMC, Model: IL220, 3 PORTS 1/4 inch	Aluminum
6.3.14	Regulators	18	Norgren,A16-Mexico,3/8 Inch Prt Size,1/4 Inch Gauge Size	Aluminum
6.3.15	I / P. Converters	13	Mfr: Nuovopignone-Italy, RTE Series	Aluminum
6.3.16	Pressure Transmitters	21	Mfr:bailey Babcock-USA, TYPE: ka1 & ka2	Aluminum
6.3.17	Flow Transmitters	16	Mfr:bailey Babcock-USA, TYPE: BQ 7 & BQ 8,Series 10k	Aluminum
6.3.18	Magnetic Flow	1	Flowmeter, Magnetic inductive, Application: Severe Service, Fluid Type: Sea Water, Model: OPTIFLUX 2300	Aluminum
6.3.19	Magnetic Flow	1	Flowmeter, Magnetic Assy 24 Inch/Ansi 150 Epoxy Lined	Aluminum
6.3.20	Magnetic Flow	1	flowmeter, Magnetic inductive, Application: Severe Service, Fluid Type: Sea Water, Model: OPTIFLUX 2300	Aluminum
6.3.21	Magnetic Flow	1	30" F-68700 CERNAY/CH-4153 REINACH,Tx.Sensor: PROMAG 50 W 30"	Aluminum
6.3.22	Magnetic Flow	1	Flowmeter, Magnetic Assy 18" Inch/Ansi 150 Epoxy Lined Carbon Steel To Conform To Std.Ansi-150 Rf- Ansi-B-16-5	Aluminum
6.3.23	LEVEL TRANSMITTERS	9	Mfr:bailey Babcock-USA, TYPE: BQ 7 & BQ 8,Series 10k	Carbon Steel
6.3.24	RTDs with Thermowell and Head	28	Mfr:Technomatic-italy, Laben Milano	Carbon Steel
6.3.25	Thermocouple with Thermowell and Head	7	Mfr:Technomatic-italy, Laben Milano	Carbon Steel
6.3.26	Solenoid Valve	8	Mfr: Morrel, Model: ED 300 N 55U005, IP 85	Copper

7. Phase-I Steam Turbines



- **Manufacturer: Franco Tosi – Italy**
- **Turbine Type: W.R.I- 16, Serial No.: 5363 / 1974**
- **Capacity: 30 MW, Rated Speed: 3000 RPM**
- **Over Speed: 3300 RPM,**
- **Steam Inlet Pressure: 42 bars**
- **Steam Inlet Temperature: 455°C**
- **Steam Exhaust Pressure: 0.101 (abs)**
- **Automat Extraction Pressure: 2.4 bar**
- **No. OF UNITS : 4**

7.1. Phase-I Steam Turbines - Mechanical Parts:

Sr. No.	Item/Equipment / Classification	Photo/ Drawing	Q	Description	Major Material
7.1.1	HP Cylinder Part		4	Manufacturer: Franco Tosi HP Impulse Blading: 1 Curtis Stage HP Reaction Blading: 22 Stage No. OF UNITS : 4	Carbon Steel
7.1.2	LP Cylinder Part		4	Manufacturer: Franco Tosi LP Impulse Blading: 1 rateau Stage LP Reaction Blading: 5Stage No. OF UNITS : 4	Carbon Steel
7.1.3	Rotor		4	Manufacturer: Franco Tosi Mean diameter of rotor: 909 mm Length of the rotor: 5603 mm, the rotor is machined from a solid forging of alloy steel No. OF UNITS : 4	Carbon Steel
7.1.4	Steam Turbine (Driver of Feed Pump)		1	Manufacturer: KKK Model: AF 4 G Turbine Capacity: 470-511 KW Turbine Speed: 2960 RPM No. OF UNITS : 1	Cast Steel
7.1.5	Steam Turbine (Driver of Feed Pump)		2	Manufacturer: KKK Model: CF 4 G Turbine Capacity: 325 KW Turbine Speed: 2971 RPM No. OF UNITS : 2	Cast Steel
7.1.6	Boiler Feed Pump 1,2,3,4,A & B		6	Manufacturer: KSB/ H.P centrifugal multi-stages P/P Model: CF 4 G Turbine Capacity: 235 m3/h Total head: 60.9 bar , 638 m head No. OF UNITS : 6	Cast Steel
7.1.7	Sump Pump		4	Manufacturer: KSB Model: MKA -B20-4-280 Capacity: 18 m3/h Speed: 595 RPM	Cast Steel

		No. OF UNITS : 4	
7.1.8	C.W Pump	8	Manufacturer: Franco Tosi Model: S.V .53 Capacity: 9724 G.P.M Speed: 595 RPM No. OF UNITS : 8 Cast Steel
7.1.9	Condensate Extraction Pump	8	Manufacturer: KSB Model: RVJK 100-380/2, Ser. No. 545712/15 Capacity: 127 m3/h,66m head Speed: 1450 RPM No. OF UNITS: 8 Cast Steel
7.1.10	Booster Pump	8	Manufacturer: Sociata Model: HC 50-125N Capacity: 27 m3/h, Speed: 2950 RPM No. OF UNITS : 8 Cast Steel
7.1.11	Auxiliary oil pump	4	Manufacturer: Franco Tosi Capacity: 7.5 H-P (AC) No. OF UNITS : 4 Cast Steel
7.1.12	Turning Gear oil Pump	4	Manufacturer: Franco Tosi Capacity: 7.5 H-P (AC) No. OF UNITS : 4 Cast Steel
7.1.13	Emergency Oil Pump	4	Manufacturer: Franco Tosi Capacity: 7.5 H-P (DC) No. OF UNITS : 4 Cast Steel
7.1.14	Instrument Air Compressor	2	Manufacturer: Ingersoll Rand Model: SIERRA-SM45A Capacity: 6.5 m3/h, Speed: 2930 RPM Discharge Pressure: 8.5 Bar No. OF UNITS : 2 Cast Steel
7.1.15	Service Air Compressor	1	Manufacturer: ELGI Model: E55-10 Capacity: 8.21 m3/min, Power: 55KW Cast Steel

		Discharge Pressure: 9.8 Bar		
		No. OF UNITS : 1		
7.1.16	Turbine Thrust Bearing	4	TYPE: W.R.I.16 Material: SAE 11 & 12 ASTM B 23 or SAE 13-16 ASTM B 23 MFR: FRANCO TOSI MECCANICA-ITALY OR ZAHNRADDER RENK-GERMANY.	SAE 11 & 12 ASTM B 23 or SAE 13-16 ASTM B 23
7.1.17	Throttle Valve	4	MFR: FRANCO TOSI MECCANICA-ITALY TYPE: Hydraulic type, double plug valve	Cast Steel
7.1.18	Turning Gear	4	ASSEMBLY ROTOR TORNING DRG NO 583155. FOR 25 MW TURBINE. PART NO: 4719; MFR: FRANCO TOSI. Speed: 3 RPM	Cast Steel
7.1.19	Condenser Tubes	16	Number of tubes per bundle: 1000 Tube Dimensions: 4 m length, 1" Dia. (OD), 1 mm Thickness	Al-Bronze
Phase-I Steam Turbines – Mechanical Main Spare Parts:				
7.1.20	HP Cylinder Part (Spare)	4	Kept in Turbine hall beside Steam Turbine #1 Manufacturer: Franco Tosi HP Impulse Blading: 1 Curtis Stage HP Reaction Blading: 22 Stage	Carbon Steel
7.1.21	Rotor (Spare)	1	Kept in Turbine hall beside Steam Turbine #1 Manufacturer: Franco Tosi Mean diameter of rotor: 909 mm Length of the rotor: 5603 mm, the rotor is machined from a solid forging of alloy steel Overhauled and assessment report is available	Carbon Steel
7.1.22	H.P. Reaction Row No 20	214	Kept In Chemical Store#2	High Alloyed Steel
7.1.23	H.P. Reaction Row No 21	212	Kept In Chemical Store#2	High Alloyed Steel
7.1.24	H.P. Reaction Row No 9	328	Kept In Chemical Store#2	High Alloyed Steel
7.1.25	H.P. Reaction Row No 10	332	Kept In Chemical Store#2	High Alloyed Steel
7.1.26	H.P. Reaction Row No 11	342	Kept In Chemical Store#2	High Alloyed Steel

7.1.27	H.P. Reaction Row No 17	286	Kept In Chemical Store#2	High Alloyed Steel
7.1.28	H.P. Reaction Row No 18	218	Kept In Chemical Store#2	High Alloyed Steel
7.1.29	H.P. Reaction Row No 6	340	Kept In Chemical Store#2	High Alloyed Steel
7.1.30	H.P. Reaction Row No 8	368	Kept In Chemical Store#2	High Alloyed Steel
7.1.31	L.P. Reaction Row No 3	238	Kept In Chemical Store#2	High Alloyed Steel
7.1.32	H.P. Reaction Row No 12	228	Kept In Chemical Store#2	High Alloyed Steel
7.1.33	H.P. Reaction Row No 13	230	Kept In Chemical Store#2	High Alloyed Steel
7.1.34	H.P. Reaction Row No 7	354	Kept In Chemical Store#2	High Alloyed Steel
7.1.35	H.P. Reaction Row No 19	216	Kept In Chemical Store#2	High Alloyed Steel
7.1.36	L.P. Reaction Row No1	354	Kept In Chemical Store#2	High Alloyed Steel
7.1.37	L.P. Reaction Row No 2	192	Kept In Chemical Store#2	High Alloyed Steel
7.1.38	H.P. Reaction Row No 2	294	Kept In Chemical Store#2	High Alloyed Steel
7.1.39	H.P. Reaction Row No 3	298	Kept In Chemical Store#2	High Alloyed Steel
7.1.40	H.P. Reaction Row No 14	234	Kept In Chemical Store#2	High Alloyed Steel
7.1.41	H.P. Reaction Row No 15	236	Kept In Chemical Store#2	High Alloyed Steel
7.1.42	H.P. Reaction Row No 1	292	Kept In Chemical Store#2	High Alloyed Steel
7.1.43	H.P. Reaction Row No 4	310	Kept In Chemical Store#2	High Alloyed Steel
7.1.44	H.P. Reaction Row No 5	320	Kept In Chemical Store#2	High Alloyed Steel
7.1.45	H.P. Reaction Row No 16	242	Kept In Chemical Store#2	High Alloyed Steel
7.1.46	H.P. Reaction Row No 22	236	Kept In Chemical Store#2	High Alloyed Steel
7.1.47	L.P. Impulse Row No 1	128	Kept In Chemical Store#2	High Alloyed Steel
7.1.48	Journal Bearing (Position 1 & 2)	2	Kept In Chemical Store#2 New Bearings supplied by Franco Tosi Diameter 227.6 mm X 228 mm Long Turbine Bearings	Steel
7.1.49	Refurbished Journal Bearing (Position 1 & 2)	3	Kept In Chemical Store#2 Refurbished Bearings Diameter 227.6 mm X 228 mm Long Turbine Bearings	

7.1.50	Journal Bearing (Position 3 & 4)	2	Kept In Chemical Store#2 New Bearings supplied by Franco Tosi Diameter 278mm X 340 mm Long Generator Bearings	Steel
7.1.51	Refurbished Journal Bearing (Position 3 & 4)	8	Kept In Chemical Store#2 Refurbished Bearings Diameter 278mm X 340 mm Long Generator Bearings	Steel
7.1.52	SET Rotor Labyrinth Seals	2	Kept In Chemical Store#2	Steel
7.1.53	H.P.Steam Chest Nozzle (Segments)	3	Kept In Chemical Store#2	High Alloyed Steel
7.1.54	Stator Impulse Row in 2 Halves	1	Kept In Chemical Store#2	High Alloyed Steel
7.1.55	H.P. Impulse Row No 1	348	Kept In Chemical Store#2	High Alloyed Steel
7.1.56	H.P. Impulse Row No 2	232	Kept In Chemical Store#2	High Alloyed Steel
7.1.57	SET Rotor Blade Assembly Materials	1	Kept In Chemical Store#2	Steel
7.1.58	Stator H.P. Impulse Row (Deviator Blades & Segments)	75	Kept In Chemical Store#2	High Alloyed Steel
7.1.59	Stator Labyrinth seals	1 SET	Kept In Chemical Store#2	High Alloyed Steel
7.1.60	Phase-I Steam Turbine old Bearings	4	Old Bearings, Kept In Chemical Store#2	
7.2. Phase-I Steam Turbines - Electrical Parts:				
7.2.1	Steam turbine Generator	4	Manufacturer: ASGEN Type:T-2-37500, 3 Phase 2 Pole 50Hz 3000 RPM 37500KVA 0.8PF, Weight: 76000 KG	Copper/Steel
7.2.2	Generator Rotor (Spare)	1	Used in Generator Type:T-2-37500, 3 Phase 2 Pole 50Hz 3000 RPM 37500KVA 0.8PF, Rotor Weight: 19000 KG	Copper/Steel
7.2.3	HP dosing pump motor	4	Frame size: RFU5547, 415V, 0.55 KW, 1410 RPM, Total weight: 6.7 Kg	Copper/Steel
7.2.4	LP Dosing pump motor	5	Frame size: REC12/47R, 415V, 0.18 KW, 1360 RPM, Total weight: 6.7 Kg	Copper/Steel
7.2.5	Aux Oil Pump motor	4	Frame size: 132, 415V, 7.5 KW, 1450 RPM,	Copper/Steel
7.2.6	Emergency Oil Pump motor	4	Frame size: 139, 240V, 40 KW, 2850 RPM,	Copper/Steel

7.2.7	Booster pump motor	8	Frame size: 112 M2, 415V, 3 KW, 2500 RPM, Total weight: 45 Kg	Copper/Steel
7.2.8	Service Air Compressor motor A	1	Frame size: 250, 415V, 55 KW, 1480 RPM, Total weight: 450 Kg	Copper/Steel
7.2.9	Service Air Compressor Fan motor A	1	Frame size: 90, 415V, 1.5 KW, 1420 RPM, Total weight: 30 Kg	Copper/Steel
7.2.10	Service Air Compressor motor B	1	Frame size: 200L , 415V, 45 KW, 2965 RPM, Total weight: 290 Kg	Copper/Steel
7.2.11	Service Air Compressor fan motor B	1	Frame size: 90, 415V, 1.5 KW, 1390 RPM, Total weight: 30 Kg	Copper/Steel
7.2.12	Cleans Drain pump motor	2	Frame size: 132MA4, 415V, 7.5 KW, 1445 RPM, Total weight: 75 Kg	Copper/Steel
7.2.13	Turbine Sump Pump motor	4	Frame size: AM80N2, 415V, 1.4KW, 2800 RPM, Total weight: 15 Kg	Copper/Steel
7.2.14	Bearing Cooling Water Pump motor	4	Frame size: AL90LA2, 415V, 2.2 KW, 2825 RPM, Total weight: 2800 Kg	Copper/Steel
7.2.15	Turning Gear motor	4	Frame size: 160L8, 415V, 5.5 KW, 720 RPM, Total weight: 69 Kg	Copper/Steel
7.2.16	Turning Gear Oil Pump motor	4	Frame size: 200, 415V, 7.5 KW, 1450 RPM,	Copper/Steel
7.2.17	Condensate Extraction pump motor	8	Frame size: 225M4, 415V, 43 KW, 1470 RPM, Total weight: 300 Kg	Copper/Steel
7.2.18	Cooling Water pump motor	8	Frame size: 355C/10, 415V, 85 KW, 595 RPM, Total weight: 974 Kg	Copper/Steel
7.2.19	Oil Vapor Fan motor	8	Frame size: AM90LCA2, 415kV, 2.2 KW, 2850 RPM, Total weight: 15 Kg	Copper/Steel
7.2.20	Gland Condenser Fan motor	8	Frame size: AM80ZBA2, 415V, 1.1 KW, 2830 RPM, Total weight: 15 Kg	Copper/Steel
7.2.21	Service Sea Water pump motor	4	Frame size: 160L4, 415V, 15 KW, 1460 RPM, Total weight: 133 Kg	Copper/Steel
7.2.22	Instrument Air compressor motor	2	Frame size: LS225, 415V, 60 KW, 2960 RPM, Total weight: 551 Kg	Copper/Steel
7.2.23	Instrument Air compressor Fan motor	2	Frame size: 112M4 , 415V, 4 KW, 1440 RPM, Total weight: 45 Kg	Copper/Steel
7.2.24	Cooling Water Booster pump motor	8	Frame size: 132SA2, 415V, 5.5 KW, 2910 RPM, Total weight: 65 Kg	Copper/Steel

7.2.25	Lube Oil Purifier motor	4	Frame size: MV90L4, 415V, 1.5 KW, 1420 RPM, Total weight: 15 Kg	Copper/Steel
7.2.25	Boiler Feed Pump motor	3	Frame size: MIB 500 90, 3.3kV, 565 KW, 2970 RPM, Total weight: 2500 Kg	Copper/Steel
7.2.26	Boiler Feed Pump motor (Spare)	1	Frame size: MIB 500 90, 3.3kV, 565 KW, 2970 RPM, Total weight: 2500 Kg	Copper/Steel
7.2.27	LP Dosing Mixer motor	2	Frame size: 80, 415V, 1.4 KW, 2845 RPM, Total weight: 35.5 Kg	Copper/Steel
7.2.28	Reserve Feed Water pump motor	2	Frame size: F225S4, 415V, 30 KW, 1480 RPM, Total weight: 45 Kg	Copper/Steel
7.2.29	Speed Changer Motor	4	Frame size: 63, 240VDC,40 KW, 2000 RPM, Total weight: 5 Kg	Copper/Steel
7.2.30	Fast run Back motor	4	Frame size: 63, 240VDC,40 KW, 2000 RPM, Total weight: 5 Kg	Copper/Steel
7.2.31	LP PASSOUT Motorize Actuators (Turbine Hall)	4	Frame size: 5221, 415V,1.5 KW, 2880 RPM, Total weight: 170 Kg	Copper/Steel
7.2.32	Turbine Hall Ventilation Compressor Motor	1	Frame size: 132M4 , 415V, 7.5 KW, 1460 RPM, Total weight: 70 Kg	Copper/Steel
7.2.33	PH-I, Bank 11 Batteries 240VDC	180	Type : KPL 270P, Manufacturer: HBL, A/H:270	Nickel Cadmium
7.2.34	PH-I, Bank 12 Batteries 240VDC	180	Type : KPL 270P, Manufacturer: HBL, A/H:270	Nickel Cadmium
7.2.35	PH-I, Bank 21 Batteries 240VDC	180	Type : KPL 275P, Manufacturer: HBL, A/H:275	Nickel Cadmium
7.2.36	PH-I, Bank 22 Batteries 240VDC	180	Type : KPL 270P, Manufacturer: HBL, A/H:270	Nickel Cadmium
7.2.37	PH-I, UPS System Bank 1 220VC	180	Type : SBM65-2, Manufacturer: SAFT	Nickel Cadmium
7.2.38	PH-I, UPS System Bank 2 220VC	180	Type : SBM65-2, Manufacturer: SAFT	Nickel Cadmium
7.2.39	PH-I, DCS System Bank 1 24VDC	21	Type : SBM830-1, Manufacturer: SAFT	Nickel Cadmium
7.2.40	PH-I, DCS System Bank 2 24VDC	21	Type : SBM830-1, Manufacturer: SAFT	Nickel Cadmium

7.3. Phase-I Steam Turbines - Instrumentation Parts:

7.3.1	Control Valves	4	BLAKEBOROUGH, BV802/A21FFB, 1"	Cast Steel
7.3.2	Control Valves	4	Fluxotrol CO15/1 , type ASA 150, DN 10"	Carbon Steel
7.3.3	Control Valves	4	HORA 300.01, Actuator Type: PA1080-60-M20, Size: 6"/ flange ends	Carbon Steel





7.3.4	Control Valves	4	Fisher controller, type 513, range 6-30 psi	Aluminum Alloys
7.3.5	Control Valves	4	Fisher controller, type 513, range 6-30 psi	Aluminum Alloys
7.3.6	ON-OFF Valves	12	Delta, type W/221/PB12, range 0-100 bar	Aluminum Alloys
7.3.7	Load limit Device Controller	4	Fisher controller, type 4150, supply pressure 20 psi, output pressure 3-15 psi	Aluminum Alloys
7.3.8	Pressure Transmitters	40	ASD800, -1 - +100 Bar	Aluminum Alloys
7.3.9	Flow Transmitters	4	ASK800, 0-200H2O	Aluminum Alloys
7.3.10	Level Transmitters	4	ASK800, -400 - +400 mbar	Aluminum Alloys
7.3.11	Temperature Transmitters	148	RTD, range 0-100 C, ABB TTH200E1 HBSEM	Aluminum Alloys
7.3.12	Transducers/Turbine Speed/Rotor/Eccentricity/Differential expansion	16	EPRO SPEED TRANSMITTER, MMS3311, GERMANY	Aluminum Alloys
7.3.13	Transducers/Axial expansion/ bearing no.1,2,3&4	20	EPRO SHAFT DISPLACEMENT TRANSMITTER, MMS 3210 , GERMANY	Aluminum Alloys
7.3.14	Pressure Gauges	64	Wika EN 837-1 0-70 bar	Stainless Steel
7.3.15	Limit Switches	148	Micro SWITCH, Precision limit switch	Aluminum Alloys
7.3.16	Flow Switches	40	FlotecT,220 V, model V4-SS-2-U-216	Aluminum Alloys
7.3.17	Level Switches	4	Model CV M25.MO.M2.WPXX , type. S Range 100 l/h, 220V	Aluminum Alloys
7.3.18	Temperature Switch	28	Accurate, Model A131 , Range 0-150 C	Aluminum Alloys
7.3.19	Pressure Switch	60	SWITCH, PRESSURE DIAPHRAGM TYPE REF: W 204 1 G E8 02 F RANGE: 50 - 350 M BAR PROCESS CONN: 1/4 INCH NPT MFR: DELTA CONTROLS, UK.	Aluminum Alloys
7.3.20	Instrument Tube	135m	Stainless steel, 316L,Type: Seamless, S.S/10mm/ S.S/12mm	Stainless Steel
7.3.21	Instrument cables	7695m	T/A1 -T/A2 -T/A3 & T/A4 - 2 pairs	Copper
7.3.22	Instrument cables	540m	T/A1 -T/A2 -T/A3 & T/A4 - 8 pairs	Copper

8. Phase-II Gas Turbine GT-5



- **Gas Turbine Fram 9D**
- **Manufacturer: ABB-Ansaldo**
- **Capacity: 30 MW**
- **Rated Generator Speed: 3000 RPM**
- **Turbine Speed: 9000 RPM**


8.1. Phase-II Gas Turbine - Mechanical Parts:

No	Item/Equipment / Classification	Photo/ Drawing	Q	Description	Major Material
8.1.1	Axial Compressor		1	<p>MFR:15 stage Axial Compressor connected to Gas Turbine</p> <p>Rotor material: Alloy steel</p> <p>Compressor blades material: Chromium stainless steel</p>	Steel
8.1.2	Gear Box		1	<p>MFR: MAAG Type: GX-56S, Center Distance: 565 mm (GT 1314)</p> <p>Main gears No.: 2</p> <p>Type: Helical</p> <p>Material: Cast steel</p>	Steel
8.1.3	Combustion Chamber		1	<p>MFR: ABB for Gas Turbine Type- 9, single, vertical, one burner, one nozzle fuel and one swirl vanes.</p> <p>Material: Cast steel</p>	Steel
8.1.4	Main oil tank		1	<p>Height 97 cm, width 205</p> <p>Material: Carbon steel</p>	Steel
8.1.5	Oil filter		2	<p>Material: Cast steel</p> <p>Diameter 57 cm</p> <p>Height 115 cm</p>	Steel

8.1.6	Auxiliary oil pumps	2	AC R5711 for lube oil AC R5715 for power oil Pumps types: Vertical Material: Cast steel	Steel
8.1.7	Jacking Oil Pump	1	- P/NO: 4008 INDENT NO: HTGD 33457 OP 1 211 7240 PE 6 ZW 70 /300/3 S 80 DRG: HGT 3-4- 695020 FOR CONTROL & LUBE OIL SYSTEM OF GAS TURBINE, DC 4008 Pump type: Reciprocating Pump Material: Cast steel	Steel
8.1.8	Cooling oil pump	1	Pumps types: Vertical Material: Cast steel	Steel
8.1.9	Journal Bearings	1	200 mm Diameter Material: Cast steel	Steel
8.1.10	Thrust Bearing	1	12 bronze pads Material: Bronze & lead	Steel



8.1.11	Coolant recirculating pump		2069 coolant recirculating pump for generator cooling system Pump type: Centrifugal overhang Pump Material: Carbon steel	<i>Carbon Steel</i>
8.1.12	Air Blow Off Control Valves		3 Type: Relief valves Diameter: 12 " Material: Cast steel	Steel
8.1.13	Manual filling pump		1 Manual filling pump for generator cooler 2074 Material: Cast steel	Steel
8.1.14	Burner		1 Contain the spark igniter and swirl vanes Material: Cast steel	Steel
8.1.15	Turbine & compressor Casing		1 Material: steel	Steel
8.1.16	Hot gas casing		1 Width 223 cm, height 163 cm Material: Cast steel	Steel

					Steel
8.1.17	Exhaust Duct		1	Material: Carbon steel Dimensions: 21.386 m Length, 5.7m Width, 2.8 m Height .	
8.1.18	Rotor barring gear		1	Material: Cast steel	Steel
8.1.19	Speed governor		1	NRV valve Material: Cast steel	Steel
8.1.20	Turbine		1	4 Stages blades reaction type	Steel
8.1.21	Air intake with filters		1	2 Stage of air filters self-cleaning type No. of filters: 476 Material: Carbon steel	Steel
8.1.22	Gas main stop valve		1	Type: Gate Valve Diameter: 6" Material: Cast steel	Steel
8.1.23	Starting valve		1	Type: relief valve Diameter: 6" Material: Cast steel	Steel
8.1.24	Gas stop Valve		1	Type: Globe valve Material: Carbon steel Diameter: 6" Model: IR 253 / D	Steel
8.1.25	Air cleaning compressors		2	Capacity: 500 L Working Pressure: 12 Bar @120 C°	Steel

Phase-II Gas Turbine – Mechanical Main Spare Parts:

8.1.26	Hot gas casing (Spare)		1	Width 223 cm, height 163 cm Material: Cast steel	Steel
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8.1.27 Corrugated Liner of the Combustion Chamber



1

Steel

8.1.29 Turbine Bearings for G.E Gas Turbines

3

Gas Turbine Main Journal Bearings
Diameter 253 mm X 254 mm Long

Steel

Phase-II Gas Turbine – special Tools

Alstom B 265169, Br 310 kg Dim: 91X69X130 cm Customer Ref GT-5 Tools Trolley M 90 Box # 1

Rack -A

Sr. No.	Item	Quantity
8.1.30	First Aid Box Small	1
8.1.31	Box Spanner 10 to 22 mm	1 Box
8.1.32	Number Punch Box 0 to 9	1
8.1.33	Number Punch Alphabet Box A to Z (Box)	1
8.1.34	Engineering Blue	1
8.1.35	Scale 0 to 300 mm	1
8.1.36	Knife	1
8.1.37	Right Angle 4" X 6"	2
8.1.38	Sizer	1
8.1.39	Divider Small	1
8.1.40	Pin Punch	5
8.1.41	Metal Marker	1
8.1.42	Diamond Point Chisel	1

Rack -B

8.1.43	Sandvik Coromont (620.25)	1
8.1.44	Monkey Player	1
8.1.45	Allen Key 14 mm and 12 mm	2

8.1.46	Inside Caliber	1
8.1.47	Player Special	1
8.1.48	Star Screwdriver	2
8.1.49	Screwdriver	3
8.1.50	Wire Brush	1
8.1.51	Plastic Measure Scale 2 Mtrs	1
Rack -C		
8.1.52	Box Spanner 10 to 32 mm	1 Box
8.1.53	Allen Key 14,17,19 mm with socket	3 Nos
8.1.54	Open Ring Spanner 6 7 8 11 13 14 15 16 17 18 19 mm	13
8.1.55	Open Spanner 17 X 19 mm	1
8.1.56	Open Ring Spanner 21 27 30 34 36 41	6
8.1.57	Wire Cutting Player	1
8.1.58	Measuring Tape 30 mtr	1
Rack -D		
8.1.59	Triangle Files	2
8.1.60	Round Files	3
8.1.61	Flat Files	1
8.1.62	Half Round Files	1
8.1.63	Sprit Level Magnetic	1
8.1.64	Chisel	2
8.1.65	White Metal Bearing Scrapper	1
8.1.66	Copper Bar	2
8.1.67	Wire Brush	1
8.1.68	Round Painting Brush	1
Rack -E		
8.1.69	Threading Tapes 8 mm	1
8.1.70	Threading Tapes 10 mm	2
8.1.71	Threading Tapes 14 mm	2
8.1.72	Threading Tapes 16 mm	2
8.1.73	Threading Tapes 20 mm	2

8.1.74	Threading Tapes 24 mm	2
8.1.75	Threading Tapes 3/8" BSP	2
8.1.76	Threading Tapes 1/2" BSP	2
8.1.77	Threading Tapes 5/8" BSP	2
8.1.78	Threading Tapes 3/4" BSP	2
8.1.79	Threading Tapes 1" BSP	2
8.1.80	Threading Dies 6 mm	2
8.1.81	Threading Dies 20 mm + 16 mm	2
8.1.82	Threading Dies 24 mm	1
8.1.83	Dies Holder	2
8.1.84	Taps Holder	3
8.1.85	Plastic Hammer	1
8.1.86	Hammer	1
8.1.87	Tap Wrenches with ratchet for RHS & LHS	2
8.1.88	20.5 mm dia 34 mm cutter tools	2
8.1.89	Drill Machine Drill Bit Socket	3
8.1.90	10.2,12,14,16,18,21,22 mm drill bit	7
Rack -F		
8.1.91	Hole Punch 2 mm + 0.50 mm Set	1 Box
	Thread Tap and Dies Box 3 mm -2,4mm-2, 5mm-	1Box
8.1.92	2,6mm -2 8mm-1, 10 mm-1 12 mm-2 Tapes. 3 mm-1,4mm-1 6mm-1 Dies	
8.1.93	Retaining Ring Player set	1 Box
8.1.94	Drill Bit Set 1mm to 6 mm (5 p/cs Missing)	1 Box
8.1.95	Gasket Cutter	1 Box
8.1.96	Pipe Tube Bender	1
8.1.97	Gripper Clamp	1
8.1.98	Cleaning Brush	1
8.1.99	S.S. Wire 1 mm	1
Rack -G		
8.1.100	Grinding Machine small	1

8.1.101	Dial Gauge Magnetic Block	1
8.1.102	Loctite	1
8.1.103	Copaslip	1
8.1.104	Oil can	1

Alstom B 265169, Br 310 kg Dim: 91X69X130 cm Customer Ref GT-5 Tools Trolley M 90 Box # 2

Rack -A

Sr. No.	Item	Quantity
8.1.105	First Aid Box Small	1
8.1.106	Feeler Gauge Small	1
8.1.107	Pin Punch	11
8.1.108	Knife	1
8.1.109	Chisel	2
8.1.110	Sizer	1
8.1.111	Inside Caliber	1
8.1.112	Measuring Right Angle	1
8.1.113	Number Punch Box 0 to 9	1
8.1.114	Number Punch Alphabet Box (A to Z)	1
8.1.115	Sprit level Magnetic	1
8.1.116	Scale 0 to 500 mm dia to 200 mm	2
8.1.117	Right Angle 4" X 6"	1
8.1.118	Allen key set 1.5 mm to 8 mm	1
8.1.119	Marker	1
8.1.120	Measuring Tape 30 Mtr	1

Rack -B

8.1.121	Monkey Player	2
8.1.122	Feeler Gauge Long	1
8.1.123	Pipe Spanner (Monkey Player Type)	1
8.1.124	Feeler Gauge long	1
8.1.125	Pipe Spanner (Monkey puller Type)	1
8.1.126	Player (Special)	1

8.1.127	Scrapper	1
8.1.128	Nose Player	1
8.1.129	Allen key 22mm,17mm,14mm,12mm	4
8.1.130	Chisel Diamond Point	1
8.1.131	Metal Marker	1
8.1.132	Star Screwdriver	7
8.1.133	Screwdriver	9
8.1.134	6" Divider	1
8.1.135	Metal Cutting Sizer	1
8.1.136	Grip Player	1
8.1.137	Normal Player	1
8.1.138	2 Meter Measurement	1
Rack –C		
8.1.139	10 mm to 32 mm box spanner set (Box)	1
8.1.140	Feeler Gauge Long	1
	Open Ring Spanner-	23
8.1.141	5,6,7,8,9,10,11,12,13,14,15,17,18,19,22,24 mm	
	Open Spanner 6X7 mm 10X11 mm 14X15 mm 18X19	4
8.1.142	mm	
8.1.143	21X23 mm Ring Spanner	1
8.1.144	Adjustable Spanner 8" & 10"	2
8.1.145	Grip Player	1
8.1.146	Wrench	1
8.1.147	Open Ring Spanner 21,27,30,32,34,36 & 41 mm	8
Rack –D		
8.1.148	Copper Bar dia 40 mm X 290 long	1
8.1.149	Painting Brush for (for cleaning)	2
8.1.150	Wire Brush	1
8.1.151	Chisel	3
8.1.152	Chisel Diamond Point	1
8.1.153	Small File set (1 Missing)	13
8.1.154	Copper Bar dia 30 mm X 200 mm long	1
8.1.155	Half Round + Round File	2

8.1.156	Flat file	4
8.1.157	Half Round file	3
8.1.158	Round file	2
8.1.159	Triangle file	8
Rack –E		
8.1.160	Copper Hammer	1
8.1.161	Plastic Hammer	2
8.1.162	Hammer	2
8.1.163	Adjustable Spanner 320 mm long	1
8.1.164	Crowbar 395 mm long	1
8.1.165	Hacksaw	1
8.1.166	Plastic Bar	1
8.1.167	Metal Cutter Taper	3
8.1.168	Tap wrenches with Ratchet for RHS & LHS	2
8.1.169	Drill Machine with Drill bit Socket	4
8.1.170	Drill Bit 10.2,12,14,16,18,18.2, 21,22	8
8.1.171	Thread Ties- 16mm,20mm,24mm	3
8.1.172	Thread Tape Handles	3
8.1.173	Thread Dies Handles	2
8.1.174	Adjustable 375 mm	1
8.1.175	Thread Tapes 1/8",1/4",3/8", 1/2", 5/8", 3/4",1"	14
Rack –F		
8.1.176	Thread Dies and Tapes set with Handles Dies 3 mm to 12 mm	7
8.1.177	Tapes 3 mm to 12 mm (Each Tape three pieces)	21
8.1.178	Drill Bit Set 6 mm to 10 mm (Box)	41
8.1.179	Drill Bit Set 1 mm to 6 mm (Box)	51
8.1.180	Drill Bit Set 4 mm to 12 mm (Box)	7
8.1.181	Pipe Tube Bender	1
8.1.182	Easy Remover Set	1
8.1.183	Oil Cane	1
8.1.184	Gripper Clamp	1
8.1.185	Cleaning Brush	2

8.1.186	Flashlight Torch	1
8.1.187	Retaining Ring Player set	1
8.1.188	Allen Key Set (4 p/cs missing)	7
8.1.189	Gasket cutter Manual	1
8.1.190	1 mm 5.5 wire (Rolls)	2
Rack –G		
8.1.191	Electric Hand Drill Machine	1
8.1.192	C- Clamps	2
8.1.193	Flexible Wire	1
8.1.194	Wire cutting Player	1
8.1.195	Emery Stone	1
8.1.196	Lead wire Roll	1
8.1.197	Small Hacksaw Blades 2 sets (each 5 p/cs)	2
8.1.198	High Speed Cutter Set -1 (6 p/cs)	1
8.1.199	High Speed Cutter	9
8.1.200	Drill Bit -5mm,6.8mm,8.5 mm	7
8.1.201	Hand Tube Light	1
8.1.202	Electric Plug with wire	2

8.2. Phase-II Gas Turbine - Electrical Parts:

8.2.1	Gas Turbine Generator	1	Manufacturer: BBC Type: WY 16L-044 LLT, 3 Phase 2 Pole 50Hz 3000 RPM 48940 KVA 0.8PF, Weight: 68150 KG	Copper/Steel
8.2.2	Spare Winding for Gas Turbine Generator	2	Generator Spare Windings (Generator Manufacturer: BBC Type: WY 16L-044 LLT) Total Weight for the windings is 650 KG	Copper
8.2.3	Brushless Exciter motor	1	Frame Size: WBF6-4G, Voltage: 260/355V, Power: 343/639W, Speed: 3000 RPM, Total Weight: 9 Kg	Copper/Steel
8.2.4	Generator Cooling Water Circulation pump motor	1	Frame Size: QUZY-225-S4BC, Voltage: 380V, Power: 33 kw, Speed: 1475 RPM, Total Weight: 500 Kg	Copper/Steel
8.2.5	Aux. Power Oil Pump Motor	1	Frame Size: QUVXY-250, Voltage: 380V,	Copper/Steel

		Power: 5/30KW, Speed: 1440 RPM, Total Weight: 450 Kg Frame Size: QUXY60L2BD, Voltage: 380V,	
8.2.6	Fuel Oil Pump Motor	1 Power: 85 KW, Speed: 2950 RPM, Total Weight: 750 Kg Frame Size: QUXY90S2AR, Voltage: 400V,	Copper/Steel
8.2.7	Lube Oil Purifier Motor	1 Power: 1.5 kW, Speed: 2800 RPM, Total Weight: 18 Kg Frame Size: d 3A710-2, Voltage: 220V,	Copper/Steel
8.2.8	Fuel Gas Extraction Fan Motor	1 Power: 0.37 kw, Speed: 2805 RPM, Total Weight: 7 Kg Frame Size: QUXY160LBC, Voltage: 380V,	Copper/Steel
8.2.9	Control Oil Pump Motor	1 Power: 12.8 kw, Speed: 2925 RPM, Total Weight: 100 Kg Frame Size: QuF-280, Voltage: 380V,	Copper/Steel
8.2.10	Fuel Oil Pump Motor	1 Power: 15.5 kw, Speed: 2950 RPM, Total Weight: 100 Kg Frame Size: GNF132L46, Voltage: 125 VDC,	Copper/Steel
8.2.11	DC Emergency Oil Pump Motor	1 Power: 2.2 kw, Speed: 1000 RPM, Total Weight: 100 Kg Frame Size: V1-112M, Voltage: 125VDC,	Copper/Steel
8.2.12	Control Oil Pump Motor	1 Power: 7.5 kw, Speed: 1450 RPM, Total Weight: 100 Kg Frame Size: 160L A/1, Voltage: 400V, Power:	Copper/Steel
8.2.13	Air Compressor Motor	2 15 kw, Speed: 1470 RPM, Total Weight: 333 Kg Frame Size: UUXY90S2AR, Voltage: 415V,	Copper/Steel
8.2.14	Oil Vapor Fan Motor	1 Power: 1.5 kw, Speed: 2800 RPM, Total Weight: 15 Kg Frame Size: QUXY200L8AD, Voltage: 380V,	Copper/Steel
8.2.15	Cooling Oil Fan Motor	4 Power: 11 kw, Speed: 730 RPM, Total Weight: 85 Kg Frame Size: QUXY200L8AD, Voltage: 380V,	Copper/Steel
8.2.16	Cooling Water Fan Motor	4 Power: 11 kw, Speed: 730 RPM, Total Weight: 85 Kg Frame Size: D518MD89394, Voltage:	Copper/Steel
8.2.17	Flap Actuator	1 415V, Power: ... kw, Speed: 80 RPM, Total Weight: 35 Kg	Copper/Steel

8.2.18 Seal Actuators	2	Frame Size: TPC-A-0AI-1C1-A000, Voltage: 415V, Power 0.03 kw, Speed 90 RPM, Tot. Weight 35 Kg	Copper/Steel
8.2.19 Fuel Gas Actuators	4	Frame Size: ..., Voltage: 415V, Power: ... kw, Speed: RPM, Total Weight: 35 Kg	Copper/Steel
8.2.20 Purging Air Compressor	2	Frame Size: D0211, Voltage: 415V, Power: 15kw, Speed: 1470 RPM, Total Weight: 180 Kg	Copper/Steel
8.2.21 Ph-II, GT5 control Room 125VDC	9 9		Nickel Cadmium
8.2.22 Ph-II, GT5 control Room 24VDC	1 9		Nickel Cadmium

8.3. Phase-II Gas Turbine - Instrumentation Parts:

No	Item/Equipment / Classification	Photo/ Drawing	Q	Description	Major Material
8.3.1	Pressure Transmitters		3	ABB	Stainless steel
8.3.2	Gas Metering System		1	Elektrischer Medumformer AVC 200	Stainless steel
8.3.3	RTD's and Thermocouples		19	Mfr: BBC-Switzerland, order No: 1-332382	Stainless steel
8.3.4	Pressure Gauges		12	Mfr: burden tube	Stainless steel
8.3.5	Temperature Gauges		16	Mfr: BBC TGT3 4-695056	Stainless steel
8.3.6	Level Switches		2	Mft: Officine Orobicha	Stainless steel
8.3.7	Pressure Switches		8	MFR: Huba control AG	Stainless steel
8.3.8	Temperature Switches		7	Mfr: BBC TGT3 4-695056	Stainless steel
8.3.9	Limit and Proximate Switches		13	Switch, limit roller lever actuated, type: EX-AR roller mat. Bronze, actuation: counter	Aluminum
8.3.10	Isolation and Drain Valves		9	MFR: HOKE INTERN. LTD, U.S.A, VALVE, NEEDLE 316SS BODY	Carbon Steel
8.3.11	Solenoid Valves		8	Type 10230 - Swiss land 230 v , 50Hz	Carbon Steel
8.3.12	DC/AC Converter		1	INVERTER CVA-30B	Aluminum
8.3.13	Filter and Regulator		2	FISHER	Stainless steel
8.3.14	Pressure Gauges		2	WIKA	Stainless steel
8.3.15	Solenoid Valves (Air Intake)		110	Mfr: GOYEN AUSTRALI	Stainless steel
8.3.16	Vibration Pick-Up		6	Type: V23G Swiss F92400 courbevoie S/N:02789	Aluminum

9. Phase-I Gas Reducing Station GRS#1 & Condensate Handling System



- **Inlet Gas Pressure: 65 Bars**
- **Outlet Gas Pressure: 4 Bars**
- **Consists mainly of 2scrabbers, 2knock outputs, 2 Fine filters, 2 primary bath heaters, 3 secondary bath heaters, hydrocarbon condensate tank & Flare system.**

9.1 Phase-I Gas Reducing Station GRS#1- Mechanical Parts:

No	Item/Equipment / Classification	Photo/ Drawing	Q	Description	Major Material
9.1.1	Knock out Pot		2	OD 600, Thickness 35 mm, long 2.7 Mt.	Steel
9.1.2	Primary Bath Heater		2	Primary Bath Heater (Including Burner and Chimney)	Steel
9.1.3	Fire Tube ND1000 X 5 mm		2	OD1000 x 5 mm Thk, 7.3 Mt.	Steel
9.1.4	Gas Coil ND150		2	Sch. 80, OD 168.3, 11 mm Thk , 146 Mt. long	Steel
9.1.5	Shell Ø 2743 x 10 mm		2	OD2743 x 10 mm Thk, 7.3 Mt.	Steel
9.1.6	Gas Burner		2	-----	
9.1.7	Chimney ND1000 x 5 mm		2	OD1000 x 5 mm Thk, 7.3 Mt.	Steel
9.1.8	Secondary Bath Heater		3	Secondary Bath Heater Including Burner and Chimney	Steel
9.1.9	Fire Tube ND600 x 5 mm		3	Ø 600 x 5 mm x 7 Mt	Steel
9.1.10	Gas Coil ND150		3	Sch. 80, OD 168.3, 11 mm Thk , 96 Mt. long	Steel
9.1.11	Shell Ø 1500 x 12 mm		3	OD1500 x 10 mm Thk, 6 Mt.	Steel
9.1.12	Gas Burner		3	-----	
9.1.13	Chimney ND600 x 5 mm		3	Ø 600 x 5 mm x 5 Mt	Steel
9.1.14	Swinney Filter		2	OD 400, Thickness 50 mm, long 2.0 Mt.	Steel
9.1.15	Flame arrestor		5	Size; 4 inches	Steel
9.1.16	Safety Valve		4	Size; 4 inches, class 600	Steel
9.1.17	Plug valve		5	Size; 12 inches, class 600	Steel
9.1.18	Plug valve		2	Size; 10 inches, class 300	Steel
9.1.19	Plug valve		12	Size; 8 inches, class 300	Steel
9.1.20	Plug valve		12	Size; 6 inches, class 600	Steel
9.1.21	Plug valve		10	Size; 4 inches, class 600	Steel
9.1.22	Butterfly Valve		7	Size; 14 inches, class 150	Steel
9.1.23	Ball Valve		3	Size; 4 inches, class 600	Steel
9.1.24	Ball Valve		5	Size; 6 inches, class 600	Steel
9.1.25	Ball Valve		3	Size; 8 inches, class 150	Steel
9.1.26	Ball Valve		5	Size; 12 inches, class 600	Steel
9.1.27	Steel Pipe		12 length	Size 4 inches, Schedule 40	Steel
9.1.28	Steel Pipe		16 length	Size; 6 inches, Schedule 40	Steel
9.1.29	Steel Pipe		12 length	Size; 8 inches, Schedule 80	Steel
9.1.30	Steel Pipe		14 length	Size; 10 inches, Schedule 80	Steel
9.1.31	Steel Pipe		10 length	Size; 12 inches ,Schedule 80	Steel

9.1.32	Condensate Tank	1	Max Design Pressure: 80 PSIG Operating Pressure: 1.0 bar Design Temperature: 80o C Tank Capacity: 45 m3 Bursting Discs: 3.5 Bar, 4.5 bar
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9.2 Phase-I Gas Reducing Station GRS#1- Electrical Parts:

9.2.1	Main gas Supply line Actuators	2	Frame Size: .., Voltage: 415V, Power: 0.42 kw, Speed: .., Total Weight: 70 Kg	Copper/Steel
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9.3 Phase-I Gas Reducing Station GRS#1- Instrumentation Parts:

9.3.1	Primary Stream No.1 Regulator	1	RMG, Type:512, Size: 3"	Aluminum Alloys
9.3.2	Primary Stream No.2 Regulator	1	FISHER, Type: 310A-32A, Size: 3"	Carbon Steel
9.3.3	Primary Pilot Stream Regulator	1	FISHER, Type: 310A-32A	Carbon Steel
9.3.4	Secondary Stream Working Monitor Regulator	3	FISHER, Type: 310A-32A-32A, Size: 3" inlet 4" outlet	Carbon Steel
9.3.5	Secondary Stream Active Regulator	3	FISHER, Type: 310A-32A, Size: 3"	Carbon Steel
9.3.6	Line Guard System with regulator	3	4 way valve	Stainless Steel
9.3.7	Line Guard Pressure Shut Off Valve	3	Fisher	Aluminum Alloys
9.3.8	ON-OFF Valve	5	Fisher	Carbon Steel
9.3.9	Solenoid	11	Fisher	Carbon Steel
9.3.10	Regulators	16	Fisher, TYPE: 95L, Size: 1/2"	Carbon Steel
9.3.11	Flare Igniter	6	Combustex, Pilot Pro	Carbon Steel
9.3.12	B.H Pressure Regulator	4	Fisher	Carbon Steel
9.3.13	Shut Off Valve Primary B.H	2	Fisher	Carbon Steel
9.3.14	Pressure Relieve Valve B.H	6	Fisher	Carbon Steel
9.3.15	Temperature Gauges	10	Wika en-13190	Carbon Steel
9.3.16	Differential Pressure Gauges	2	NUOVA FIMA MP2	Carbon Steel
9.3.17	Pressure Gauges	58	NUOVA FIMA MP2 160 Bar	Stainless Steel
9.3.18	Level Switches	7	AYVAZ, Type C-4	Carbon Steel
9.3.19	Flow Transmitters	2	Rosemount, Model:300SMVMRA, Built-in Orifice Size:12"	Stainless Steel
9.3.20	Pressure Transmitters	3	ABB	Aluminum Alloys
9.3.21	Flare System	1	----	steel

10. Phase-II Gas Reducing Station GRS#2



- **Inlet Gas Pressure: 65 Bars**
- **Outlet Gas Pressure: 4 Bars**
- **Consists of 2scrabbers, 2knock outputs, 2 Fine filters and 2 bath heaters**

10.1. Phase II - Gas Reducing Station GRS#2 - Mechanical Parts:

No	Item/Equipment / Classification	Photo/ Drawing	Q	Description	Major Material
10.1.1	Knock out Pot		2	OD 1000, Thickness 30 mm, long 8 Mt.	Steel
10.1.2	Scrubber Filters		2	OD 600, Thickness 30 mm, long 3 Mt.	Steel
10.1.3	Bath Heaters A & B		2	Bath Heaters A & B (Including Burner and Chimney)	Steel
10.1.4	Fire Tube		2	Sch. 5S, OD 610, Thickness 4.19 mm, long 12 Mt.	Steel
10.1.5	Gas Coil		2	Sch. 80s, OD 89, Thickness 7.62 mm, long 6 Mt.	Steel
10.1.6	Heater outer shell		2	Sch. 80s, OD 610, Thickness 12.7 mm, long 6 Mt.	Steel
10.1.7	Gas Burner		2	-----	Steel
10.1.8	Chimney		2	Sch. 5S, OD 610, Thickness 4.19 mm, long 6 Mt	Steel
10.1.9	Swinney Filters		2	OD 400, Thickness 20 mm, long 3 Mt.	Steel
10.1.10	Flame arrestor		2	Size; 1 inch	Steel
10.1.11	Flame arrestor		2	Size; 3 inches	Steel
10.1.12	Flame arrestor		1	Size; 8 inches	Steel
10.1.13	Pressure Damper		1	----	Steel
10.1.14	Plug valve		2	Size; 4 inches, class 600	Steel
10.1.15	Pneumatic Plug valve		4	Size; 1½ inches, class 600	Steel
10.1.16	Plug valve		1	Size; 6 inches, class 600	Steel
10.1.17	Pneumatic Plug valve		2	Size; 2 inches, class 600	Steel
10.1.18	Pneumatic Plug valve		2	Size; 6 inches, class 600	Steel
10.1.19	Pneumatic Plug valve		2	Size; 4 inches, class 600	Steel
10.1.20	Pneumatic Plug valve		2	Size; 3 inches, class 600	Steel
10.1.21	Motorized Ball Valve		1	Size; 4 inches, class 600	Steel
10.1.22	Safety Valve		1	Size; 2 inches, class 600	Steel
10.1.23	Safety Valve		4	Size; 3 inches, class 600	Steel
10.1.24	Ball Valve		8	Size; 2 inches, class 600	Steel
10.1.25	Ball Valve		20	Size; 4 inches, class 600	Steel
10.1.26	Ball Valve		9	Size; 6 inches, class 600	Steel
10.1.27	Ball Valve		2	Size; 8 inches, class 600	Steel
10.1.28	Globe Valve		6	Size; 2 inches, class 600	Steel
10.1.29	Steel Pipe		8 length	Size; 4 inches, Sch. 40	Steel
10.1.30	Steel Pipe		10 length	Size; 6 inches, Sch. 80	Steel
10.1.31	Steel Pipe		2 length	Size; 8 inches, Sch. 80	Steel

10.3. Phase – II Gas Reducing Station GRS#2 - Instrumentation Parts:



No	Item/Equipment / Classification	Photo/ Drawing	Q	Description	Major Material
10.3.1	Control Valve		2	Gas pressure regulator with silencer and monitor incorporated reflux 819+DB +PM DN 3-inch S/NO: 8203 & 8207/87 range:70 to 14.4 bar Mfr: Pietro Fiorentini, Italy.	Stainless Steel
10.3.2	Pilot Regulator Control Valve		8	Mfr: Pietro Fiorentini Italy., size: 3 inch	Stainless Steel
10.3.3	Isolator's Actuator		2	Isolating V/V MFR: Pietro Fiorentini Italy., size: 3 inch Range: 70 TO 14.4 BAR	Aluminum
10.3.4	Control Valve		2	1 IN TYPE: PVS 782. S/NO: 1101/2 MFR: Pietro Fiorentini, Milano, Italy.	Stainless Steel
10.3.5	Control Valve		2	Mfr: Nuovo Pignone, RANGE: 275 to 325 mm	Stainless Steel
10.3.6	Control Valve		2	Mfr: FISHER, RANGE: 6.5 to 1.4 bar	Stainless Steel
10.3.7	Control Valve		2	Mfr: Pietro Fiorentini, size: 4 inch RANGE: 14.4 4 BAR	Stainless Steel
10.3.8	Pilot regulator		2	Mfr: Pietro Fiorentini, size: 4 inch RANGE: 14.4 4 BAR	Stainless Steel
10.3.9	Actuator		2	Mfr: Pietro Fiorentini, size: 4 inch RANGE: 14.4 4 BAR	Stainless Steel
10.3.10	Actuator		2	Mfr: Pietro Fiorentini, size: 4 inch RANGE: 14.4 4 BAR	Stainless Steel
10.3.11	Level Control Valve		2	Mfr: Pietro Fiorentini Italy., size: 1 inch	Stainless Steel
10.3.12	Control Valves		2	Mfr: Fisher	Stainless Steel
10.3.13	Solenoid Valves		6	MFR: HERION	Aluminum
10.3.14	Solenoid Valves		10	Two-way solenoid valve 24 VDC n.c. Type EA/2037. Italimpianti Mfr: Metano Impianti.	Aluminum
10.3.15	Pressure Transmitter		1	Mfr: BAILLY, 0-80 BAR	Aluminum
10.3.16	Gas Flow Transmitter		1	Mfr: BAILLY, 0-80 BAR	Aluminum
10.3.17	Differential Pressure gauges		5	Mfr: Ettore Cella Spa, Italy	Aluminum
10.3.18	Limit Switches		10	Switch, limit roller lever actuated, type: EX-AR roller mat. Bronze, actuation: counter clockwise, electrical rating:15 amp s.p.d.t ,housing: explosion proof, Mfr: micro switch, U.S.A	Aluminum
10.3.19	Resistance Temperature Detectors		2	RTD	Stainless Steel
10.3.20	Pressure Switch		9	SWITCH, PRESSURE MFR: ETTORE CELLA SPA, ITALY	Aluminum
10.3.21	Level Switch		7	SWITCH, LEVEL FOR FINE FILTER GRS SINGLE MICROSWITCH AS PER ATTACHED SPECIFICATION SHEETS. MFR: OFFICINE.	Stainless Steel
10.3.22	Flow Transmitters		2	Rosemount, Model:300SMVMRA, Built-in Orifice	Stainless Steel

11. Phase-I, II & III Demin Plants



- Used to demineralize the distilled water in order to use it in the boilers
- Consists of 3 Mixed Bed, as well as several chemical Tanks

11.1. Phase-I, II & III Demin Plants- Mechanical Parts

No	Item/Equipment / Classification	photo/ Drawing	Q	Description	Major Material
11.1.1	Mixed bed exchanger		3	201 - 202 - 203 / 1200 diameter - 2400 high Material: Carbon steel rubber from inside	Steel
11.1.2	Mixed bed diaphragm v/v		20	2 " diameter Material: Cast iron	Steel
11.1.3	Mixed bed + air blower v/v		10	2" diameter Type: diaphragm v/v Material: Stainless steel	Steel
11.1.4	Air blowers		2	1.5 Bar / Q = 25 m3/h Material: Cast iron	Steel
11.1.5	Caustic soda pumps		2	Type: Reciprocating Pump Dosing pump / 2 bar pressure / Q= 190 m3/h	Steel

11.1.6 Caustic soda storage tank



1

650 mm diameter / 1000 mm high / 0.25 m3 volume
Material: Stainless steel

Steel

11.1.7 Acid storage tank

1

650 mm diameter / 1000 mm high / 0.25 m3 volume
Material: fiberglass

Steel

11.1.8 Acid recycle tank



1

High 1400 mm / thickness 3 mm / width 1000 m

Steel





11.1.9 Service Air Compressor








2

MFR: ELGI. Capacity: 5.38 m3/min. Type: E37-10.

Scrap Steel

11.1.10 Instrument Air Compressor		2	MFR: Ingersoll Rand. Capacity: 31.5 m3/min. Type: ESV-NIL.	Scrap Steel
11.1.11 Air Dryer		2	MFR: Ingersoll Rand. Capacity: 31.5 m3/min. Type: D1890IN-A MFR: Ingersoll Rand. Capacity: 3.16 m3/min. Type: TMS 80	Scrap Steel
11.1.12 Instrument air receiver		1	Thickness 29.7 mm Diameter 1390 mm High 3500 mm	Scrap Steel
11.1.13 Service air receiver		1	Thickness 29.7 mm Diameter 1390 mm High 3500 mm	Scrap Steel
11.1.14 Acid tank		1	3000 mm high /Diameter 2130 mm / Thickness 29.7 mm / 0.25 m3 volume Material: Stainless steel	Scrap Steel

<p>11.1.15 Caustic soda tank</p>		<p>1</p>	<p>3000 mm high /Diameter 2130 mm / Thickness 29.7 mm / 0.25 m3 volume Material: Fiberglass</p>	<p>Fiberglass</p>
<p>11.1.16 Acid pump</p>		<p>2</p>	<p>Dosing pump / 2 bar pressure / Q = 190 m3/h Type: Reciprocating Pump Material: stainless steel</p>	<p>stainless steel</p>
<p>11.1.17 Caustic soda pump</p>		<p>2</p>	<p>Dosing pump / 2 bar pressure / Q = 190 m3/h Type: Reciprocating Pump Material: stainless steel</p>	<p>Scrap Steel</p>
<p>11.1.18 Mixed bed exchanger</p>		<p>2</p>	<p>Thickness 3.3 mm / High 5000 mm/ Diameter 1100 mm</p>	<p>Scrap Steel</p>
<p>11.1.19 Mixed bed diaphragm v/v</p>		<p>2</p>	<p>2 " diameter Material: Cast iron</p>	<p>Cast iron</p>

11.2. Phase-I, II & III Demin Plants- Electrical Parts:

11.2.1	RFW pump (NEW) motor	1	Frame size: F225 S4, 240V, 30 KW, 1480 RPM, Total weight: 118 Kg	Copper/Steel
11.2.2	RF - Circulation Pump motor	3	Frame size: 160 MX2, 415V, 17.3 KW, 2990 RPM, Total weight: 118 Kg	Copper/Steel
11.2.3	RFW pump motor	3	Frame size: A2001A-4, 415V, 30 KW, 2940 RPM, Total weight: 118 Kg	Copper/Steel
11.2.4	Caustic Soda Pump motor	2	Frame size: NFC 51-100, 415V, 0.55 KW, 1420 RPM, Total weight: 15 Kg	Copper/Steel
11.2.5	HCL Dosing Pump motor	2	Frame size: Heva80L4, 415V, 10 KW, 1420 RPM, Total weight: 100 Kg	Copper/Steel
11.2.6	Acid Recycle Pump motor	2	Frame size: 90, 415V, 2.2 KW, 2870 RPM, Total weight: 16 Kg	Copper/Steel
11.2.7	Instrument Air Compressor motor	2	Frame size: 225M, 415V, 39 KW, 1864 RPM, Total weight: 615 Kg	Copper/Steel
11.2.8	Service Air Compressor motor	2	Frame size: 200L 415V, 45 KW, 2965 RPM, Total weight: 300 Kg	Copper/Steel
11.2.9	Service Air Compressor Fan motor	2	Frame size: 225M, 415V, 39 KW, 1864 RPM, Total weight: 45 Kg	Copper/Steel
11.2.10	Caustic Soda Pump motor	2	Frame size: NFC 51-100, 415V, 0.55 KW, 1450 RPM, Total weight: 15 Kg	Copper/Steel
11.2.11	Acid Dilution motor	2	Frame size: 80A4, 415V, 6 KW, 1580 RPM, Total weight: 62 Kg	Copper/Steel
11.2.12	Air Mixer motor	2	Frame size: DM1 132 S2, 415V, 5.5 KW, 2920 RPM, Total weight: 59 Kg	Copper/Steel
11.2.13	Sump Pump motor	2	Frame size: 80A4, 415V, 4 KW, 1960 RPM, Total weight: 45 Kg	Copper/Steel

11.3. Phase-I, II & III Demin Plants- Instrumentation Parts:

11.3.1	Flow Transmitters	3	ABB Code NO 266DSHFSMA2B1 L1	Stainless Steel
11.3.3	Flow Transmitters	2	Foxboro Transmitter , model 823 DP	Carbon Steel
11.3.4	ON-OFF Valves	27	Saunders, Automatic Valves, Type A	Carbon Steel
11.3.5	Level Switch	3	Colima, Mecai 316	Carbon Steel
11.3.6	Pressure Gauge	16	Bourdon Sedeme France MEX5	Stainless Steel
11.3.7	Temperature Gauge	1	HP Distillate Inlet	Stainless Steel
11.3.8	Pressure Indicator	3	YOKOGAWA, EJX110A Range: 3600 psi	Stainless Steel
11.3.9	Level Indicator	2	Officine Oobicha, model: 503.B.A.J.J.N	Stainless Steel

11.3.10	Flow Indicator	2	Colima, Model: Visco, Type:150#, length 2800mm	Stainless Steel
11.3.11	On-Off Pneumatic v/v Actuators	30	Mfr: Saunder Saunair-ES, Model: ESCO-69, Diaphragm Actuator, Size: 80 mm	Carbon Steel
11.3.12	Totalizar	2	DN 50" MFR: ELSTER, MODEL: 91601 SK	Carbon Steel
11.3.13	Flow Rota Meter	4	METER-FLUX-ITALY, 6" ORFICE	Stainless Steel
11.3.14	Pressure Gauge	10	FIMA 0-4 BAR	Stainless Steel
11.3.15	Air regulator	2	Norgren Model: 112GD	Aluminum
11.3.16	Instrument Tube	460m	Copper-1/4"	Copper
11.3.17	Instrument Tube	50m	Stainless steel, 316L, Type: Seamless, S.S/12mm	Aluminum
11.3.17	Instrument cable	1093m	12 Cores	Copper
11.3.17	Instrument cable	330m	3 Cores	Copper

12. Phase – I, II & III Distillate Storage Tanks (Break Tank 1 & 2)



- Each tank capacity is around 3050 m³
- Tank diameter is 18 m, 12 m height.
- Made of mild steel.

No	Item/Equipment / Classification	Photo/ Drawing	Q	Description	Major Material
12.1.1	Break Tank		2	Capacity: 3050 m3 Diameter: 18m Height: 12m	Carbon Steel

13. Phase-I, II & III Sea Water Intakes







- Phase I sea water intake consists mainly of two Rotating Screens with their reduction gears as well as screen wash pumps.
- Phase II sea water intake consists mainly of one Rotary Chain Type Screen as well as a travelling bridge along with their reduction gears as well as screen wash pumps.

13.1. Phase- I, II & III Seawater Intakes - Mechanical Parts:

No	Item/Equipment / Classification	Photo/ Drawing	Q	Description	Major Material
13.1.1	Rotating Screen Assembly # 1 & 2		2	Mfr. F. W Brackett Colchester .UK	Carbon Steel
13.1.2	Reduction Gear Box No. 1 & 2		2	Mfr: F.W Brackett Colchester .UK	Carbon Steel
13.1.3	Screen wash Pump No. 1 & 2		2	Mfr. SCOPEL POMPE ITALY	Carbon Steel
13.1.4	Sea feed pump Basket Strainers		2	Basket Filters	Carbon Steel
13.1.5	Sea feed Pumps		3	Type: KDP-80/26H Mfr: Kirloskar India	Carbon Steel
13.1.6	Coarse Screens Gate		8	Size; 12 Ft x 8 Ft	Carbon Steel
13.1.7	Log Stop Gates Small		7	Small Size: 7 Ft x 7 Ft	Carbon Steel
13.1.8	Log Stop Gates Big		5	Big Size: 10 Ft x 12 Ft	Carbon Steel
13.1.9	Upright Carbon Steel Stand		1	Stand for Coarse Screens and Log gates	Carbon Steel
13.1.10	Butterfly Valves		4	Size; 4 inches	Carbon Steel
13.1.11	Butterfly Valves		3	Size; 6 inches	Carbon Steel
13.1.12	Butterfly Valves		5	Size; 8 inches	Carbon Steel
13.1.13	Non-Return Valve		1	Size; 8 inches	Carbon Steel
13.1.14	Non-Return Valve		1	Size; 6 inches	Carbon Steel
13.1.15	Ball Valve		7	Size; 3 inches	Carbon Steel
13.1.16	Ball Valve		8	Size; 4 inches	Carbon Steel
13.1.17	Gate Valve		5	Size; 4 inches	Carbon Steel
13.1.18	Gate Valve		9	Size; 6 inches	Carbon Steel
13.1.19	Diaphragm Valve		4	Size; 3 inches	Carbon Steel
13.1.20	Chain Rotary Screen Assembly with sprocket wheel		1	Rotary Chain Type Screen	Carbon Steel
13.1.21	Screen Reduction Gear Box		1	Gear Box	Carbon Steel
13.1.22	Travelling Bridge Gear Box Assembly		1	Gear Box	Carbon Steel
13.1.23	Travelling Bridge Air Blower		1	Mfr: ROBUSCHI ITALY	Carbon Steel
13.1.24	Travelling Bridge & Pump		1	Travelling Bridge walk way And Pump	Carbon Steel
13.1.25	Screen wash pump Type: R2T-R2V (Vertical)		2	Mfr. SCOPEL POMPE ITALY	Carbon Steel

13.1.26	Log Gates	4	Size: 5Ft x 14Ft	Carbon Steel
13.1.27	Log Gates	6	Size: 7Ft x 7Ft	Carbon Steel
13.1.28	Hypo Injection Pumps A & B	2	Pump	Carbon Steel
13.1.29	Service Water Pumps	2	Pump	Carbon Steel
13.1.30	Acid Cleaning pumps	2	Pump	Carbon Steel
13.1.31	Purging Fan	2	Fan	Carbon Steel
13.1.32	Sea Water Inlet Basket Filters A & B	2	Basket Filters	Carbon Steel
13.1.33	Hypo chloride Acid Tank TK1001A	1	Tank : TK1001A	Carbon Steel
13.1.34	Hypo chloride Tank A & B TK1001B	2	Tank: TK1001B	Carbon Steel
13.1.35	Butterfly Valves	8	Size ; 8 inches	Carbon Steel
13.1.36	Butterfly Valves	3	Size ; 6 inches	Carbon Steel
13.1.37	Butterfly Valves	11	Size ; 4 inches	Carbon Steel
13.1.38	Butterfly Valves	6	Size ; 3 inches	Carbon Steel
13.1.39	Non-Return Valve	2	Size ; 8 inches	Carbon Steel
13.1.40	Non-Return Valve	9	Size ; 4 inches	Carbon Steel
13.1.41	Gate Valve	2	Size ; 6 inches	Carbon Steel
13.1.42	Diaphragm Valve	10	Size ; 4 inches	Carbon Steel
13.1.43	Diaphragm Valve	4	Size ; 3 inches	Carbon Steel
13.1.44	Building Structure I-Beam	lot	Size: 160 x150 mm(Weight 18 kg per mtr)	Carbon Steel
13.1.45	Building Structure I-Beam	lot	Size: 200 x200 mm(Weight 25 kg per mtr)	Carbon Steel
13.1.46	Building Structure I-Beam	lot	Size:160 x 80 mm(Weight 12 kg per mtr)	Carbon Steel
13.1.47	Building Structure I-Beam	lot	Size :200 x 400 mm (Weight 75 kg per mtr)	Carbon Steel
13.1.48	Building Structure Channel	lot	Size :60 x 120 mm(Weight 6 kg per mtr)	Carbon Steel
13.1.49	Wooden Door	1	Size; 2.2 x 4 Meters	Wood
13.1.50	Metal Door	2	Size: 2.1 x 3 Meter	Carbon Steel

13.1.51 Phase – I Rotating Screens Stands		4 Kept Beside Distiller 5 Height: 4.55 m Diameter: 600 mm Thickness: 12 mm	Carbon Steel
13.1.52 Phase – I Course Screens & their Stand/frame		9 Kept in Phase – I Sea Water Intake Area	Steel
13.1.53 Culverts Stop Gates		4 Kept in Phase – I Sea Water Intake Area	Steel
13.1.54 Phase – II Course Screen		1 Kept in Phase – I Sea Water Intake Area	Steel

13.2. Phase- I, II & III Seawater Intakes - Electrical Parts:

13.2.1 PH-I, Sea Feed Pump motor	3 Frame Size: 132 M2, Voltage: 415V, Power: 11 KW, Speed: 1460 RPM, Total Weight: 108 Kg	Copper/Steel
13.2.2 PH-I, Service Water Pump Motor	2 Frame Size: 160, Voltage: 415V, Power: 11 KW, Speed: 1460 RPM, Total Weight: 108 Kg	Copper/Steel
13.2.3 PH-I, Spurge Pump Motor	2 Frame Size: 200L, Voltage: 415V, Power: 30 KW, Speed: 1470 RPM, Total Weight: 159 Kg	Copper/Steel

13.2.4	PH- I Screen Drive Motor	2	Frame Size: 200, Voltage: 415V, Power:3/7.5 KW,Speed:360/1440 RPM, Total Weight:170kg	Copper/Steel
13.2.5	PH-II, Screen Drive motor	1	Frame Size: 100L, Voltage: 415V, Power: 0.54/0.94KW, Speed: 710/1410 RPM, Total Weight: 45Kg	Copper/Steel
13.2.6	PH-II, Travelling Bridge motor	1	Frame Size: 132s, Voltage: 415V, Power: 5.5 KW, Speed: 2870 RPM, Total Weight: 59Kg	Copper/Steel
13.2.7	PH-II, Compressor Traveling Bridge motor	1	Frame Size: 132s, Voltage: 415V, Power: 4.6 KW, Speed: 2930 RPM, Total Weight: 48Kg	Copper/Steel

13.3. Phase- I, II & III Seawater Intakes - Instrumentation Parts:

13.3.1	Control Valves	1	Severn Glocon, DN3"	Carbon Steel
13.3.2	ON-OFF Valve	3	Alfa Valvole,	Aluminum Alloys
13.3.3	ON-OFF Valve	2	Masoneilan, Valve, Control Complete Camfle X li, Body Size: 1.1/2", Body	Carbon Steel
13.3.4	Pressure Switch	3	Elektronic GmbH, DW 812	Aluminum Alloys
13.3.5	Pressure Switch	1	Elektronic GmbH,	Aluminum Alloys
13.3.6	Flow Switch	2	OFFICINE OROBICHE, MODEL PL-P-2-MI1	Aluminum Alloys
13.3.7	Temperature Gauge	2	Wika en-13190	Stainless Steel
13.3.8	Level Transmitter	1	ROSEMOUNT pressure transmitter / 0 to 248 KPA	Stainless Steel
13.3.9	Pressure Switch	2	Ettore Cella S.P.A, MOD: DPA-100US	Stainless Steel
13.3.10	Pressure Gauge	18	NUOVA FIMA MP2	Stainless Steel
13.3.11	Level Indicator	3	Pressure Gauge Nuova FIMA, 0-6 mH2O	Stainless Steel

14. Station Transformers



- **Manufacturers:** Italtrafo, EMCO, O.E.L, G.E.C, Saicem, BBC, OCREV, PIVI & Voltamp.
- **Capacity:** Varies from 37.5 MVA to 0.187 MVA
- **Voltages:** 66KV, 11KV, 3.3KV and 415 V
- **Oil Types:** Mineral oil & Silicone oil

No	Item/Equipment / Classification	photo/ Drawing	Q	Description	Major Material
14.1	Generator Transformer No. (1)		1	Sr.#. 3H7001, Service date 1973, 37.5 MVA, HV:66kV 300.2A, LV:11kV 1968AVector Group: YNd1 Z:15.30 %, Cooling Type: OFWF, Temp rise of copper: 50 C, Temp. raise of oil 45 C, MFC.: Italtrafo, mineral oil Tap. Changer: OFF Load, Total weight: 57000 KG	Copper/Steel
14.2	Generator Transformer No. (2)		1	Sr.#. 12553, Service date 2006, 37.5 MVA, HV:66kV 300.2A, LV:11kV 1968AVector Group: YNd1 Z:15.30 %, Cooling Type: OFWF, Temp rise of copper: 50 C, Temp. raise of oil 45 C, MFC.: EMCO, mineral oil Tap. Changer: OFF Load, Total weight: 51000 KG	Copper/Steel
14.3	Generator Transformer No. (3)		1	Sr.#. 3M7040, Service date 1973, 37.5 MVA, HV:66kV 300.2A, LV:11kV 1968AVector Group: YNd1 Z:15.30 %, Cooling Type: OFWF, Temp rise of copper: 50 C, Temp. raise of oil 45 C, MFC.: Italtrafo, mineral oil Tap. Changer: OFF Load, Total weight: 57000 KG	Copper/Steel
14.4	Generator Transformer No. (4)		1	Sr.#. 3M7040/1, Service date 1973, 37.5 MVA, HV:66kV 300.2A, LV:11kV 1968AVector Group: YNd1 Z:15.30 %, Cooling Type: OFWF, Temp rise of copper: 50 C, Temp. raise of oil 45 C, MFC.: Italtrafo, mineral oil Tap. Changer: OFF Load, Total weight: 57000 KG	Copper/Steel
14.5	Generator Transformer (Spare) without mineral oil		1	Sr.#. , Service date 1973, 37.5 MVA, HV:66kV 300.2A, LV:11kV 1968AVector Group: YNd1 Z:15.30 %, Cooling Type: OFWF, Temp rise of copper: 50 C, Temp. raise of oil 45 C, MFC.: Italtrafo, mineral oil Tap. Changer: OFF Load, Total weight: 40000 KG	Copper/Steel
14.6	Spare Generator Transformer Winding		1	Spare Winding for Generator Transformer with following details 37.5 MVA, HV:66kV 300.2A, LV:11kV 1968AVector Group: YNd1 Z:15.30 %, Cooling Type: OFWF, Temp rise of copper: 50 C, Temp. raise of oil 45 C, MFC.: Italtrafo, mineral oil Tap. Changer: OFF Load, Total weight: 57000 KG	Copper/Steel
14.7	Unit Transformer No. (1)		1	Sr.#. 3M7042/1, Service date 1973, 2.5 MVA, HV:11kV 131.2A, LV:3.4kV 418.5A Vector Group: Dyn11 Z: 7.0 %, Cooling Type: ONAN, Temp rise of copper: 50 C, Temp. raise of oil 45 C, MFC.: Italtrafo, mineral oil Tap. Changer: OFF Load, Total weight: 8500 KG	Copper/Steel
14.8	Unit Transformer No. (2)		1	Sr.#. 3M7042/2, Service date 1973, 2.5 MVA, HV:11kV 131.2A, LV:3.4kV 418.5A Vector Group: Dyn11 Z: 7.0 %, Cooling Type: ONAN, Temp rise of copper: 50 C, Temp. raise of oil 45 C, MFC.: Italtrafo, mineral oil Tap. Changer: OFF Load, Total weight: 8500 KG	Copper/Steel
14.9	Unit Transformer No. (3)		1	Sr.#. 3Z7001, Service date 1975, 2.5 MVA, HV:11kV 131.2A, LV:3.4kV 418.5A Vector Group: Dyn11 Z: 7.0 %, Cooling Type: ONAN, Temp rise of copper: 50 C, Temp. raise of oil 45 C, MFC.: Italtrafo, mineral oil Tap. Changer: OFF Load, Total weight: 8500 KG	Copper/Steel

14.10	Unit Transformer No. (4)	1	Sr.#. 3Z7001/2, Service date 1975, 2.5 MVA, HV:11kV 131.2A, LV:3.4kV 418.5A Vector Group: Dyn11 Z: 7.0 %, Cooling Type: ONAN, Temp rise of copper: 50 C, Temp. raise of oil 45 C, MFC.: Italtrafo, mineral oil Tap. Changer: OFF Load, Total weight: 8500 KG	Copper/Steel
14.11	Unit. Aux. Transformer No. (1)	1	Sr.#. T11379/3, Service date 1983, 500kVA, HV:3.3kV 87.3A, LV:433V 666.7A Vector Group: Dyn1, Z: 5.10 %, Cooling Type: ONAN, MFC.: Italtrafo, silicone oil , Tap. Changer: OFF Load, Total weight: 2135 KG	Copper/Steel
14.12	Unit. Aux. Transformer No. (2)	1	Sr.#. T11379/3, Service date 1983, 500kVA, HV:3.3kV 87.3A, LV:433V 666.7A Vector Group: Dyn1, Z: 5.10 %, Cooling Type: ONAN, MFC.: Italtrafo, silicone oil , Tap. Changer: OFF Load, Total weight: 2135 KG	Copper/Steel
14.13	Unit. aux. Transformer No. (3)	1	Sr.#. T11379/3, Service date 1983, 500kVA, HV:3.3kV 87.3A, LV:433V 666.7A Vector Group: Dyn1, Z: 5.10 %, Cooling Type: ONAN, MFC.: Italtrafo, silicone oil , Tap. Changer: OFF Load, Total weight: 2135 KG	Copper/Steel
14.14	Unit. aux. Transformer No. (4)	1	Sr.#. T11379/3, Service date 1983, 500kVA, HV:3.3kV 87.3A, LV:433V 666.7A Vector Group: Dyn1, Z: 5.10 %, Cooling Type: ONAN, MFC.: Italtrafo, silicone oil , Tap. Changer: OFF Load, Total weight: 2135 KG	Copper/Steel
14.15	General Aux. Transformer No.(1)	1	Sr.#. G.A.T-1, 750kVA, HV:3.3kV 131A, LV:433V 1000A Vector Group: Dy1, Z: 5.20 %, Cooling Type: ONAN, Temp rise of copper: 50 C, Temp. raise of oil 45 C MFC.: Italtrafo, mineral oil ,Tap. Changer: OFF Load, Total weight: 2750 KG	Copper/Steel
14.16	General Aux Transformer No. (2)	1	Sr.#. 3Z7003, Service date 1975, 750kVA, HV:3.3kV 131A, LV:433V 1000A,Vector Group: Dy1, Z: 5.20 %, Cooling Type: ONAN, Temp rise of copper: 50 C , Temp. raise of oil 45 C ,MFC.: Italtrafo, mineral oil ,Tap. Changer: OFF Load, Total weight: 2750 KG	Copper/Steel
14.17	General Aux. Transformer No.(3)	1	Sr.#. 113033, Service date 1989, 750kVA, HV:3.3kV 131.2A, LV:433V,Vector Group: Dyn1, Z: 5.19 %, Cooling Type: ONAN, Temp rise of copper: 55 C, Temp. raise of oil 50 C MFC.: U.K, mineral oil ,Tap. Changer: OFF Load, Total weight: 2750 KG	Copper/Steel
14.18	Station Transformer No. (1)	1	Sr.#. 3M7041/1, Service date 1973, 5MVA, HV:66kV 43.74A, LV:3.45KV 836.7A,Vector Group: Yyn0d5, Z: 7.57 %, Cooling Type: ONAN, Temp rise of copper: 50 C, Temp. raise of oil 45 C, MFC.: Italtrafo, mineral oil , Tap. Changer: ON Load, Total weight: 21500 KG	Copper/Steel

14.19	Station Transformer No. (2)	1	Sr.#. 3M7070/1, Service date 1975, 5MVA, HV:66kV 43.74A, LV:3.45KV 836.7A, Vector Group: Yyn0d5, Z: 7.57 %, Cooling Type: ONAN, Temp rise of copper: 50 C, Temp. raise of oil 45 C, MFC.: Italtrafo, mineral oil , Tap. Changer: ON Load, Total weight: 21500 KG	Copper/Steel
14.20	Station Aux Transformer No. (1)	1	Sr.#. T11380/2, Service date 1983,1000KVA, HV:3.3kV 174.8A, LV:433V 1333A, Vector Group: Dyn1, Z: 5.24 %, Cooling Type: ONAN, Temp rise of copper: 50 C, Temp. raise of oil 45 C, MFC.: Italtrafo, silicone oil , Tap. Changer: OFF Load, Total weight: 4475 KG	Copper/Steel
14.21	Station Aux Transformer No. (2)	1	Sr.#. T11380/1, Service date 1983,1000KVA, HV:3.3kV 174.8A, LV:433V 1333A, Vector Group: Dyn1, Z: 5.24 %, Cooling Type: ONAN, Temp rise of copper: 50 C, Temp. raise of oil 45 C, MFC.: Italtrafo, silicone oil , Tap. Changer: OFF Load, Total weight: 4475 KG	Copper/Steel
14.22	1BT1 transformer	1	Sr.#. 7494, Service date 1982,6000KVA, HV:11kV 315A, LV:3.3KV 990A, Vector Group: Dyn11, Z: 7.50 %, Cooling Type: ONAN, Temp rise of copper: 50 C, Temp. raise of oil 40 C, MFC.: O.E.L, mineral oil , Tap. Changer: OFF Load, Total weight: 15282 KG	Copper/Steel
14.23	1BT2 transformer	1	Sr.#. PT0198, Service date 2017,6000KVA, HV:11kV 315A, LV:3.3KV 990A, Vector Group: Dyn1, Z: 7.95 %, Cooling Type: ONAN, Temp rise of copper: 50 C, Temp. raise of oil 40 C, MFC.: VOLTAMP, mineral oil , Tap. Changer: OFF Load, Total weight: 16600 KG	Copper/Steel
14.24	1CT1 transformer	1	Sr.#. 7492, Service date 1982,1250KVA, HV: 3.3kV 218.7A, LV:440V 1640A, Vector Group: Dyn11, Z: 5.20 %, Cooling Type: ONAN, Temp rise of copper: 50 C, Temp. raise of oil 40 C, MFC.: O.E.L, mineral oil , Tap. Changer: OFF Load, Total weight: 4340 KG	Copper/Steel
14.25	1CT2 transformer	1	Sr.#. 7493, Service date 1982,1250KVA, HV: 3.3kV 218.7A, LV:440V 1640A, Vector Group: Dyn11, Z: 5.20 %, Cooling Type: ONAN, Temp rise of copper: 50 C, Temp. raise of oil 40 C, MFC.: O.E.L, mineral oil , Tap. Changer: OFF Load, Total weight: 4340 KG	Copper/Steel

14.26	C.W intake transformer (1)	1	Sr.#. C.W.I.T-1,750KVA, HV: 3.3kV 131A, LV:433V 1000A, Vector Group: Dy1, Z: 5.23 %, Cooling Type: ONAN, Temp rise of copper: 50 C, Temp. raise of oil 45 C, MFC.: Italtrafo , mineral oil , Tap. Changer: OFF Load, Total weight: 2750 KG	Copper/Steel
14.27	C.W intake transformer (2)	1	Sr.#. 85671,800KVA, HV: 3.3kV 140A, LV:433V 1067A,Vector Group: Dy0, Z: 4.86 %, Cooling Type: ONAN, MFC.: G.E.C , mineral oil ,Tap. Changer: OFF Load, Total weight: 2800 KG	Copper/Steel
14.28	4TA-001 transformer	1	Sr.#. 40961, Service date 1984,9/12MVA, HV: 11kV 472/650A, LV:3.442kV 1501/2013A,Vector Group: Dyn1, Z: 7 %, Cooling Type: ONAF, Temp rise of copper: 55 C, Temp. raise of oil 50 C, MFC.: Saicem, mineral oil , Tap. Changer: OFF Load, Total weight: 17821 KG	Copper/Steel
14.29	3TA-001 transformer	1	Sr.#. 40963, Service date 1984,9/12MVA, HV: 11kV 472/650A, LV:3.442kV 1501/2013A,Vector Group: Dyn1, Z: 7 %, Cooling Type: ONAF, Temp rise of copper: 55 C, Temp. raise of oil 50 C, MFC.: Saicem, mineral oil , Tap. Changer: OFF Load, Total weight: 17821 KG	Copper/Steel
14.30	2TA-001 transformer	1	Sr.#. 40962, Service date 1984,9/12MVA, HV: 11kV 472/650A, LV:3.442kV 1501/2013A,Vector Group: Dyn1, Z: 7 %, Cooling Type: ONAF, Temp rise of copper: 55 C, Temp. raise of oil 50 C, MFC.: Saicem, mineral oil , Tap. Changer: OFF Load, Total weight: 17821 KG	Copper/Steel
14.31	1AT1 transformer	1	Sr.#. 7490, Service date 1982,32.5/50MVA, HV: 66kV 281/437A, LV:11.2kV 1659.9/2579A,Vector Group: Ynd1, Z: 11 %, Cooling Type: ONAF, Temp rise of copper: 50 C, Temp. raise of oil 40 C, MFC.: O.E.L, mineral oil , Tap. Changer: OFF Load, Total weight: 61500 KG	Copper/Steel
14.32	3M2 transformer	1	Sr.#. 16199-1-1, Service date 1982,940KVA, HV: 2.760kV 196.6A, LV: 380V 1428A,Vector Group: Ynd11, Z: 5.16 %, Cooling Type: ONAN, Temp rise of copper: 50 C, MFC.: BBC, mineral oil ,Tap. Changer: OFF Load, Total weight: 3320 KG	Copper/Steel

14.33	2CT1 transformer	1	Sr.#. 7509, Service date 1982,1250kVA, HV: 3.3kV 218.7A, LV:400V 1804A,Vector Group: Dzn0, Z: 5.44 %, Cooling Type: ONAN, Temp rise of copper: 50 C, Temp. raise of oil 40 C, MFC.: O.E.L, mineral oil , Tap. Changer: OFF Load, Total weight: 3447 KG	Copper/Steel
14.34	2BT1 transformer	1	Sr.#. 24146/T/1/8, Service date 1975, 1250KVA, HV: 11kV 64.7A, LV: 400V 1804A,Vector Group: Dy11, Z: 6.09 %, Cooling Type: ONAN, Temp rise of copper: 50 C, MFC.: Secheron, mineral oil ,Tap. Changer: OFF Load, Total weight: 4117 KG	Copper/Steel
14.35	2TB-001 transformer	1	Sr.#. 40958, Service date 1983, 1250kVA, HV: 3.3kV 218.7A, LV:440V 1604A,Vector Group: Dyn1,Z: 6.85 %, Cooling Type: ONAN, Temp rise of copper: 55 C, Temp. raise of oil 50 C, MFC.: Saicem, mineral oil , Tap. Changer: OFF Load, Total weight: 3283 KG	Copper/Steel
14.36	3TB-001 transformer	1	Sr.#. 40960, Service date 1983, 1250kVA, HV: 3.3kV 218.7A, LV:440V 1604A,Vector Group: Dyn1,Z: 6.85 %, Cooling Type: ONAN, Temp rise of copper: 55 C, Temp. raise of oil 50 C, MFC.: Saicem, mineral oil , Tap. Changer: OFF Load, Total weight: 3283 KG	Copper/Steel
14.37	4TB-001 transformer	1	Sr.#. 40959, Service date 1983, 1250kVA, HV: 3.3kV 218.7A, LV:440V 1604A,Vector Group: Dyn1,Z: 6.85 %, Cooling Type: ONAN, Temp rise of copper: 55 C, Temp. raise of oil 50 C, MFC.: Saicem, mineral oil , Tap. Changer: OFF Load, Total weight: 3283 KG	Copper/Steel
14.38	Dist. Aux. Transformer (1)	1	Sr.#. 3Z7003/1, Service date 1975, 750KVA, HV: 3.3kV 131A, LV:433V 1000A,Vector Group: Dy1, Z: 5.20 %, Cooling Type: ONAN, MFC.: Italtrafo , mineral oil , Tap. Changer: OFF Load, Total weight: 2750 KG	Copper/Steel
14.39	Dist. Aux. Transformer No. 2	1	Sr.#. 3Z7003/2, Service date 1975, 750KVA, HV: 3.3kV 131A, LV:433V 1000A,Vector Group: Dy1, Z: 5.20 %, Cooling Type: ONAN, MFC.: Italtrafo , mineral oil , Tap. Changer: OFF Load, Total weight: 2750 KG	Copper/Steel

14.40	Excitation Transformer #1	1	Sr.#. --, Service date 2001, 210KVA, HV: 3.3kV 36.74 A, LV:220 V 551.1 A,Vector Group: Yd 11, Z: 2X2.5%, Cooling Type: AN, MFC.: OCREV , Dry Type, Total weight: 1450 KG	Copper/Steel
14.41	Excitation Transformer #2	1	Sr.#. --, Service date 2001, 210KVA, HV: 3.3kV 36.74 A, LV:220 V 551.1 A,Vector Group: Yd 11, Z: 2X2.5%, Cooling Type: AN, MFC.: OCREV , Dry Type, Total weight: 1450 KG	Copper/Steel
14.42	Excitation Transformer #3	1	Sr.#. --, Service date 2001, 210KVA, HV: 3.3kV 36.74 A, LV:220 V 551.1 A,Vector Group: Yd 11, Z: 2X2.5%, Cooling Type: AN, MFC.: OCREV , Dry Type, Total weight: 1450 KG	Copper/Steel
14.43	Excitation Transformer #4	1	Sr.#. --, Service date 2001, 210KVA, HV: 3.3kV 36.74 A, LV:220 V 551.1 A,Vector Group: Yd 11, Z: 2X2.5%, Cooling Type: AN, MFC.: OCREV , Dry Type, Total weight: 1450 KG	Copper/Steel
14.44	3CT1 Transformer	1	Sr.#. --, Service date 1982, 187KVA, HV: 3.3kV 36.74 A, LV:90 V 1349 A,Vector Group: Yd 11, Z: 4.95%, Cooling Type: AN, MFC.: PIVI , Dry Type, Total weight: 1000 KG	Copper/Steel
14.45	3CT2 Transformer	1	Sr.#. --, Service date 1982, 187KVA, HV: 3.3kV 36.74 A, LV:90 V 1349 A,Vector Group: Yd 11, Z: 4.95%, Cooling Type: AN, MFC.: PIVI , Dry Type, Total weight: 1000 KG	Copper/Steel
14.46	Ph-I Neutral Transformer #1	1	Sr.#. T10453/1, Service date 1983, 59KVA, HV: 11kV 5.4 A, LV:177 V 333 A, Z: 3.5%, Cooling Type: LNaN, MFC.: R.F , mineral oil, Total weight: 520 KG	Copper/Steel

14.47 Ph-I Neutral Transformer #2

1

Sr.#. T10453/2, Service date 1983, 59KVA, HV: 11kV 5.4 A, LV:177 V 333 A, Z: 3.5%, Cooling Type: LNaN, MFC.: R.F , mineral oil, Total weight: 520 KG

Copper/Steel

14.48 Ph-I Neutral Transformer #3

1

Sr.#. T10453/3, Service date 1983, 59KVA, HV: 11kV 5.4 A, LV:177 V 333 A, Z: 3.5%, Cooling Type: LNaN, MFC.: R.F , mineral oil, Total weight: 520 KG

Copper/Steel

14.49 Ph-I Neutral Transformer #4

1

Sr.#. T10453/4, Service date 1983, 59KVA, HV: 11kV 5.4 A, LV:177 V 333 A, Z: 3.5%, Cooling Type: LNaN, MFC.: R.F , mineral oil, Total weight: 520 KG

Copper/Steel

15. Electrical Cables



- **Power cables used for various applications and level of voltages in SPWS.**

No.	From	Route	To	QTY	Working Voltage	Type	Conductor Material	Size (Sq.mm)	No. Of Core	Length (meter)
15.01	PH-I Demin Plant 415V Board		recirculation Pump motor 201	1	415V	XLPE	Copper	2.5	3	14
15.02	PH-I Demin Plant 415V Board		recirculation Pump motor 202	1	415V	XLPE	Copper	2.5	3	16
15.03	PH-I Demin Plant 415V Board		RFW 1 Motor	1	415V	XLPE	Copper	2.5	3	17
15.04	PH-I Demin Plant 415V Board		RFW 2 Motor	1	415V	XLPE	Copper	2.5	3	18
15.05	PH-I Demin Plant 415V Board		RFW 3 Motor	1	415V	XLPE	Copper	2.5	3	19
15.06	PH-I Demin Plant 415V Board		Caustic Soda 1	1	415V	XLPE	Copper	2.5	3	20
15.07	PH-I Demin Plant 415V Board		Caustic Soda 2	1	415V	XLPE	Copper	2.5	3	20
15.08	PH-I Demin Plant 415V Board		Acid Recycling motor	1	415V	XLPE	Copper	2.5	3	26
15.09	PH-I Demin Plant 415V Board		Exhaust Fan 1	1	415V	XLPE	Copper	2.5	3	24
15.10	PH-I Demin Plant 415V Board		Exhaust Fan 2	1	415V	XLPE	Copper	2.5	3	24
15.11	PH-I Demin Plant 415V Board		HCL Dosing pump motor 1	1	415V	XLPE	Copper	2.5	3	21
15.12	PH-I Demin Plant 415V Board		HCL Dosing pump motor 2	1	415V	XLPE	Copper	2.5	3	21
15.13	PH-I Demin Plant 415V Board		Hoist Crane	1	415V	XLPE	Copper	2.5	3	32
15.14	PH-I Demin Plant 415V Board		Socket Outlet panel	1	415V	XLPE	Copper	2.5	3	15
15.15	PH-I Demin Plant 415V Board		Lighting outlet panel	1	415V	XLPE	Copper	6	3	19
15.16	PH-I Demin Plant 415V Board		Station Aux. Board No.1	1	415V	XLPE	Copper	25	3	42
15.17	PH-I Demin Plant 415V Board		Dist.2 415V Board	1	415V	XLPE	Copper	25	3	140
15.18	PH-I Demin Plant 415V Board		Mix Ped Control panel	1	415V	XLPE	Copper	2.5	3	10
15.19	PH-I Demin Plant 415V Board		Sump Pump	1	415V	XLPE	Copper	2.5	3	38
15.20	PH-I Demin Plant 415V Board		HCL Mixer	1	415V	XLPE	Copper	2.5	3	26
15.21	PH-I Demin Plant 415V Board		Caustic Soda Mixer	1	415V	XLPE	Copper	2.5	3	27
15.22	PH-I Demin Plant 415V Board		Air Blower 1	1	415V	XLPE	Copper	2.5	3	12
15.23	PH-I Demin Plant 415V Board		Air Blower 2	1	415V	XLPE	Copper	2.5	3	13
15.24	PH-I Demin Plant 415V Board		Dryer	1	415V	XLPE	Copper	2.5	3	10
15.25	Ph-I Station Board No. 1		Station Aux. Transformer No.1	1	3.3KV	XLPE	Copper	120	3	53
15.26	Ph-I Station Board No. 1		Station Aux. Transformer No.1	1	415V	XLPE	Copper	2.5	16	53
15.27	Ph-I Station Board No. 1		Unit Aux. Transformer No.1	1	3.3KV	XLPE	Copper	120	3	54
15.28	Ph-I Station Board No. 1		Unit Aux. Transformer No.1 - Control	1	415V	XLPE	Copper	2.5	16	54
15.29	Ph-I Station Board No. 1		Unit Aux. Transformer No.2	1	3.3KV	XLPE	Copper	120	3	98
15.30	Ph-I Station Board No. 1		Unit Aux. Transformer No.2 - control	1	415V	XLPE	Copper	2.5	16	98

15.31	Ph-I Station Board No. 1	Boiler Feed Pump No.1	1	3.3KV	XLPE	Copper	120	3	30
15.32	Ph-I Station Board No. 1	Boiler Feed Pump No.1 - Control	1	415V	XLPE	Copper	2.5	24	30
15.33	Ph-I Station Board No. 1	Boiler Feed Pump No.2	1	3.3KV	XLPE	Copper	120	3	48
15.34	Ph-I Station Board No. 1	Boiler Feed Pump No.2 - Control	1	415V	XLPE	Copper	2.5	24	48
15.35	Ph-I Station Board No. 1	FD Fan No.1	1	3.3KV	XLPE	Copper	70	3	68
15.36	Ph-I Station Board No. 1	FD Fan No.1 - Control	1	415V	XLPE	Copper	2.5	16	68
15.37	Ph-I Station Board No. 1	FD Fan No.2	1	3.3KV	XLPE	Copper	70	3	86
15.38	Ph-I Station Board No. 1	FD Fan No.2 - Control	1	415V	XLPE	Copper	2.5	16	86
15.39	Ph-I Station Board No. 1	Distiller Aux. Transformer	2	3.3KV	XLPE	Copper	120	3	101
15.40	Ph-I Station Board No. 1	Distiller Aux. Transformer - Control	1	415V	XLPE	Copper	2.5	16	101
15.41	Ph-I Station Board No. 1	C.W.I Transformer No.1	1	3.3KV	XLPE	Copper	120	3	173
15.42	Ph-I Station Board No. 1	C.W.I Transformer No.1 - Control	1	415V	XLPE	Copper	2.5	16	173
15.43	Ph-I Station Board No. 1	General Aux. Transformer No.1	1	3.3KV	XLPE	Copper	120	3	93
15.44	Ph-I Station Board No. 1	General Aux. Transformer No.1 - Control	1	415V	XLPE	Copper	2.5	16	93
15.45	Ph-I Station Board No. 2	Boiler Feed Pump No.3	1	3.3KV	XLPE	Copper	120	3	40
15.46	Ph-I Station Board No. 2	Boiler Feed Pump No.3 - Control	1	415V	XLPE	Copper	2.5	24	40
15.47	Ph-I Station Board No. 2	Unit Aux. Transformer No.4	1	3.3KV	XLPE	Copper	120	3	58
15.48	Ph-I Station Board No. 2	Unit Aux. Transformer No.4 - control	1	415V	XLPE	Copper	2.5	16	58
15.49	Ph-I Station Board No. 2	Unit Aux. Transformer No.3	1	3.3KV	XLPE	Copper	120	3	92
15.50	Ph-I Station Board No. 2	Unit Aux. Transformer No.3 - Control	1	415V	XLPE	Copper	2.5	16	92
15.51	Ph-I Station Board No. 2	FD Fan No.3	1	3.3KV	XLPE	Copper	70	3	102
15.52	Ph-I Station Board No. 2	FD Fan No.3 - Control	1	415V	XLPE	Copper	2.5	16	102
15.53	Ph-I Station Board No. 2	Station Aux. Transformer No.2	1	3.3KV	XLPE	Copper	120	3	51
15.54	Ph-I Station Board No. 2	Station Aux. Transformer No.2 - Control	1	415V	XLPE	Copper	2.5	16	51
15.55	Ph-I Station Board No. 2	FD Fan No.4	1	3.3KV	XLPE	Copper	70	3	106
15.56	Ph-I Station Board No. 2	FD Fan No.4 - Control	1	415V	XLPE	Copper	2.5	16	106
15.57	Ph-I Station Board No. 2	General Aux. Transformer No.3	1	3.3KV	XLPE	Copper	120	3	62

15.58	Ph-I Station Board No. 2	General Aux. Transformer No.3 - Control	1	415V	XLPE	Copper	2.5	16	62
15.59	U.B.NO.2	U.T.No.2	3	3.3KV	XLPE	Copper	1000	1	27
15.60	U.B.NO.2	U.T.No.2 Control	1	415V	XLPE	Copper	2.5	44	22
15.61	U.B.NO.1	U.T.No.1	3	3.3KV	XLPE	Copper	1000	1	36
15.62	U.B.NO.1	U.T.No.1 - control	1	415V	XLPE	Copper	2.5	44	19
15.63	U.B.NO.3	U.T.No.3	3	3.3KV	XLPE	Copper	1000	1	29
15.64	U.B.NO.3	U.T.No.3 - Control	1	415V	XLPE	Copper	2.5	44	30
15.65	U.B.NO.4	U.T.No.4	3	3.3KV	XLPE	Copper	1000	1	48
15.66	U.B.NO.4	U.T.No.4 - Control	1	415V	XLPE	Copper	2.5	44	25
15.67	RT101	C.W.I 415V Board	3	600/1KV	XLPE	Copper	32	3	12
15.68	RT102	C.W.I 415V Board	3	600/1KV	XLPE	Copper	32	3	10
15.69	RT103	C.W.I 415V Board	3	600/1KV	XLPE	Copper	32	3	10
15.70	See Feed Pump No.1	C.W.I 415V Board	3	600/1KV	XLPE	Copper	25	3	50
15.71	See Feed Pump No.1 - control	C.W.I 415V Board	1	240v	XLPE	Copper	1.5	12	50
15.72	See Feed Pump No.2	C.W.I 415V Board	2	600/1KV	XLPE	Copper	25	3	52
15.73	See Feed Pump No.2 - control	C.W.I 415V Board	1	240v	XLPE	Copper	1.5	12	52
15.74	See Feed Pump No.3	C.W.I 415V Board	2	600/1KV	XLPE	Copper	25	3	54
15.75	See Feed Pump No.3 - control	C.W.I 415V Board	1	240v	XLPE	Copper	1.5	12	54
15.76	Rotating Screen1	Rotating Screen Motor 1	3	600/1KV	XLPE	Copper	16	3	80
15.77	Rotating Screen1	Rotating Screen Motor 1 - control	1	240v	XLPE	Copper	24	1.5	80
15.78	Rotating Screen2	Rotating Screen Motor 2	3	600/1KV	XLPE	Copper	16	3	62
15.79	Rotating Screen2	Rotating Screen Motor 2 - control	1	240v	XLPE	Copper	24	1.5	62
15.80	Sparge Pump1	Sparge Pump Motor 1	2	600/1KV	XLPE	Copper	25	3	70
15.81	Sparge Pump1	Sparge Pump Motor 1 - control	1	240v	XLPE	Copper	1.5	16	70
15.82	Sparge Pump2	Sparge Pump Motor 2	3	600/1KV	XLPE	Copper	25	3	67
15.83	Sparge Pump2	Sparge Pump Motor 2 - control	1	240v	XLPE	Copper	1.5	16	67
15.84	0-BB-003 415V Board	RT101	3	600/1KV	XLPE	Copper	35	1	40
15.85	0-BB-003 415V Board	RT101 - control	1	240v	XLPE	Copper	6	4	40
15.86	0-BB-003 415V Board	RT101 - control	1	240v	XLPE	Copper	1.5	36	80
15.87	0-BB-003 415V Board	RT102	3	600/1KV	XLPE	Copper	35	1	30
15.88	0-BB-003 415V Board	RT102 - control	1	240v	XLPE	Copper	6	4	30
15.89	0-BB-003 415V Board	RT102 - control	1	240v	XLPE	Copper	1.5	36	60
15.90	0-BB-003 415V Board	RT103	3	600/1KV	XLPE	Copper	35	1	20

15.91	0-BB-003 415V Board	RT103 - control	1	240v	XLPE	Copper	6	4	20
15.92	0-BB-003 415V Board	RT103 - control	1	240v	XLPE	Copper	1.5	36	40
15.93	0-BB-003 415V Board	Service Caustic	1	600/1KV	XLPE	Copper	16	3	28
15.94	0-BB-003 415V Board	Service Caustic - control	1	240v	XLPE	Copper	1.5	8	28
15.95	0-BB-003 415V Board	Service Hydrochloric	1	600/1KV	XLPE	Copper	16	3	30
15.96	0-BB-003 415V Board	Service Hydrochloric - control	1	240v	XLPE	Copper	1.5	8	30
15.97	0-BB-003 415V Board	Purging Fan A	1	600/1KV	XLPE	Copper	16	3	30
15.98	0-BB-003 415V Board	Purging Fan A - control	1	240v	XLPE	Copper	1.5	12	30
15.99	0-BB-003 415V Board	Purging Fan B	1	600/1KV	XLPE	Copper	16	3	30
15.100	0-BB-003 415V Board	Purging Fan B - control	1	240v	XLPE	Copper	1.5	12	30
15.101	0-BB-003 415V Board	Degassing Fan A	1	600/1KV	XLPE	Copper	16	3	27
15.102	0-BB-003 415V Board	Degassing Fan A - control	1	240v	XLPE	Copper	1.5	12	27
15.103	0-BB-003 415V Board	Degassing Fan B	1	600/1KV	XLPE	Copper	16	3	27
15.104	0-BB-003 415V Board	Degassing Fan B - control	1	240v	XLPE	Copper	1.5	12	27
15.105	0-BB-003 415V Board	Hypo Injection A	1	600/1KV	XLPE	Copper	16	3	30
15.106	0-BB-003 415V Board	Hypo Injection A - control	1	240v	XLPE	Copper	1.5	16	30
15.107	0-BB-003 415V Board	Hypo Injection B	1	600/1KV	XLPE	Copper	16	3	30
15.108	0-BB-003 415V Board	Hypo Injection B - control	1	240v	XLPE	Copper	1.5	12	30
15.109	0-BB-003 415V Board	Hypo Injection C	1	600/1KV	XLPE	Copper	16	3	32
15.110	0-BB-003 415V Board	Hypo Injection C - control	1	240v	XLPE	Copper	1.5	8	32
15.111	C.W.I 415V Board No.2	C.W.I Transformer No.2	10	600/1KV	XLPE	Copper	35	1	16
15.112	C.W.I 415V Board No.1	C.W.I Transformer No.1	10	600/1KV	XLPE	Copper	35	1	30
15.113	RT 101 Panel	RT 101 Cells	2	600/1KV	XLPE	Copper	35	1	5
15.114	RT 101 Panel	RT 101 Cells - control	1	240v	XLPE	Copper	2.5	2	5
15.115	RT 102 Panel	RT 102 Cells	2	600/1KV	XLPE	Copper	35	1	5
15.116	RT 102 Panel	RT 102 Cells - control	1	240v	XLPE	Copper	2.5	2	5
15.117	RT 103 Panel	RT 103 Cells	2	600/1KV	XLPE	Copper	35	1	5
15.118	RT 103 Panel	RT 103 Cells - control	1	240v	XLPE	Copper	2.5	2	5
15.119	C.W.I 415V Board	Screen D.B Supply	1	600/1KV	XLPE	Copper	25	3	55
15.120	C.W.I 415V Board	Screen Cathodic	1	600/1KV	XLPE	Copper	16	3	8
15.121	C.W.I 415V Board	EMS Store	1	600/1KV	XLPE	Copper	50	4	85
15.122	C.W.I 415V Board	MMS Workshop D.B2	1	600/1KV	XLPE	Copper	32	5	120
15.123	C.W.I 415V Board	Demister Clean area	1	600/1KV	XLPE	Copper	25	4	50
15.124	C.W.I 415V Board	MMS Workshop D.B2	1	600/1KV	XLPE	Copper	32	4	120
15.125	C.W.I 415V Board	Socket supply	2	600/1KV	XLPE	Copper	16	4	7

15.126	Dist#4 3.3KV Board	Distillate motor A	3	3.3KV	XLPE	Copper	185	4	42
15.127	Dist#4 3.3KV Board	Distillate motor A -Control	11	240v	XLPE	Copper	1.5	10	176
15.128	Dist#4 3.3KV Board	Blow Down Motor A	3	3.3KV	XLPE	Copper	185	4	38
15.129	Dist#4 3.3KV Board	Blow Down Motor A - Control	11	240v	XLPE	Copper	1.5	10	183
15.130	Dist#4 3.3KV Board	Brine Motor	6	3.3kv	XLPE	Copper	240	4	60
15.131	Dist#4 3.3KV Board	Brine Motor - control	11	240v	XLPE	Copper	1.5	10	230
15.132	Dist#4 3.3KV Board	Sea Water Supply motor	3	3.3KV	XLPE	Copper	185	3	50
15.133	Dist#4 3.3KV Board	Sea Water Supply motor - Control	10	240v	XLPE	Copper	1.5	10	237
15.134	Dist#4 3.3KV Board	Capacitor Bank	3	3.3KV	XLPE	Copper	185	4	40
15.135	Dist#4 3.3KV Board	Capacitor Bank - Control	5	240v	XLPE	Copper	1.5	10	220
15.136	Dist#4 3.3KV Board	4TB-001	3	3.3KV	XLPE	Copper	240	3	72
15.137	Sitra Local 11KV	4TA-001	3	11KV	XLPE	Copper	95	6	380
15.138	Dist#4 3.3KV Board	Distillate Motor B	3	3.3KV	XLPE	Copper	185	4	35
15.139	Dist#4 3.3KV Board	Distillate Motor B - Control	11	240v	XLPE	Copper	1.5	10	215
15.140	Dist#4 3.3KV Board	Blow Down Motor B	3	3.3KV	XLPE	Copper	185	4	44
15.141	Dist#4 3.3KV Board	Blow Down Motor B - Control	11	240v	XLPE	Copper	1.5	10	224
15.142	Dist#3 3.3KV Board	Distillate motor A	3	3.3KV	XLPE	Copper	185	4	26
15.143	Dist#3 3.3KV Board	Distillate motor A- Control	11	240v	XLPE	Copper	1.5	10	196
15.144	Dist#3 3.3KV Board	Distillate motor B	3	3.3KV	XLPE	Copper	185	4	26
15.145	Dist#3 3.3KV Board	Distillate motor B - Control	11	240v	XLPE	Copper	1.5	10	197
15.146	Dist#3 3.3KV Board	Blow Down Motor A	3	3.3KV	XLPE	Copper	185	4	22
15.147	Dist#3 3.3KV Board	Blow Down Motor A - Control	11	240v	XLPE	Copper	1.5	10	192
15.148	Dist#3 3.3KV Board	Blow Down Motor B	3	3.3KV	XLPE	Copper	185	4	29
15.149	Dist#3 3.3KV Board	Blow Down Motor B - Control	11	240v	XLPE	Copper	1.5	10	199
15.150	Dist#3 3.3KV Board	Brine Motor	6	3.3KV	XLPE	Copper	240	4	134
15.151	Dist#3 3.3KV Board	Brine Motor - Control	11	240v	XLPE	Copper	1.5	10	304
15.152	Dist#3 3.3KV Board	Sea Water Supply motor	3	3.3KV	XLPE	Copper	185	3	60
15.153	Dist#3 3.3KV Board	Sea Water Supply motor - control	10	240v	XLPE	Copper	1.5	10	230
15.154	3TB001 incoming	3TB001	3	3.3KV	XLPE	Copper	240	3	14
15.155	Incoming	3TA001	3	3.3kv	XLPE	Copper	95	6	15
15.156	3.3 KV C.B	C.B	3	3.3KV	XLPE	Copper	185	3	34
15.157	3.3 KV C.B	C.B - Control	5	240v	XLPE	Copper	1.5	10	204
15.158	Dist#3 3.3KV Board	3TB001	3	3.3kv	XLPE	Copper	185	6	58

15.159	Dist#3 3.3KV Board	3TB001 - control	6	240v	XLPE	Copper	1.5	10	228
15.160	Sitra Local 11KV	3TA001	3	11KV	XLPE	Copper	185	4	320
15.161	Dist#2 3.3KV Board	Distillate motor A	3	3.3KV	XLPE	Copper	185	4	67
15.162	Dist#2 3.3KV Board	Distillate motor A - Control	11	240v	XLPE	Copper	1.5	10	240
15.163	Dist#2 3.3KV Board	Distillate motor B	3	3.3KV	XLPE	Copper	185	4	67
15.164	Dist#2 3.3KV Board	Distillate motor B - Control	11	240v	XLPE	Copper	1.5	10	242
15.165	Dist#2 3.3KV Board	Blow Down Motor A	3	3.3KV	XLPE	Copper	185	4	56
15.166	Dist#2 3.3KV Board	Blow Down Motor A - Control	11	240v	XLPE	Copper	1.5	10	229
15.167	Dist#2 3.3KV Board	Blow Down Motor B	3	3.3KV	XLPE	Copper	185	4	64
15.168	Dist#2 3.3KV Board	Blow Down Motor B - Control	11	240v	XLPE	Copper	1.5	10	237
15.169	Dist#2 3.3KV Board	Brine Motor	4	3.3Kv	XLPE	Copper	240	4	55
15.170	Dist#2 3.3KV Board	Brine Motor	2	3.3KV	XLPE	Copper	240	4	59
15.171	Dist#2 3.3KV Board	Brine Motor - Control	11	240v	XLPE	Copper	1.5	10	230
15.172	Dist#2 3.3KV Board	2TB001	3	3.3KV	XLPE	Copper	185	3	60
15.173	Dist#2 3.3KV Board	Sea Water Supply motor	3	3.3KV	XLPE	Copper	185	3	107
15.174	Dist#2 3.3KV Board	Sea Water Supply motor - control	12	240v	XLPE	Copper	1.5	10	280
15.175	Dist#2 3.3KV Board	Capacitor Bank	3	3.3KV	XLPE	Copper	185	4	26
15.176	Dist#2 3.3KV Board	Capacitor Bank - Control	5	240v	XLPE	Copper	1.5	10	199
15.177	Sitra Local 11KV	2TA001	3	11KV	XLPE	Copper	185	6	323
15.178	2TA001	Incoming	3	3.3KV	XLPE	Copper	95	6	15
15.179	INCOMING	2AA-001	3	3.3kv	XLPE	Copper	240	3	11
15.180	INCOMING	2AA-002 - Control	6	240v	XLPE	Copper	1.5	10	184
15.181	GAT1	GAB1	10	415V	XLPE	Copper	120	3	28
15.182	GAT2	GAB2	10	415V	XLPE	Copper	120	3	17
15.183	GAB2	planning building	1	415V	XLPE	Copper	35	3	34
15.184	GAB	Socket 125A	1	415V	XLPE	Copper	25	4	44
15.185	GAB	Outage Room	2	415V	XLPE	Copper	25	3	25
15.186	GAB	Mess Room	1	415V	XLPE	Copper	35	3	62
15.187	GAB	Relay Room	1	415V	XLPE	Copper	35	3	20
15.188	GAB	ECR AC	1	415V	XLPE	Copper	35	3	14
15.189	GAB	ADMIN Toilet	2	415V	XLPE	Copper	240	3	60
15.190	GAB	Site Office	1	415 V	XLPE	Copper	120	3	130
15.191	GAB	EMS Training center	1	415 V	XLPE	Copper	300	3	120
15.192	GAB	Simulation Room EMS	1	415V	XLPE	Copper	50	3	125

15.193	GAB	Street Lighting	1	415V	XLPE	Copper	120	3	145
15.194	GAB	Maintenance Outlets	1	415V	XLPE	Copper	70	3	97
15.195	GAB	Boiler House	1	415v	XLPE	Copper	120	3	100
15.196	GAB	Admin Building AC	1	415V	XLPE	Copper	240	3	75
15.197	GAB	Control Block	1	415V	XLPE	Copper	35	3	55
15.198	GAB	Mint 15-18	1	415V	XLPE	Copper	25	3	90
15.199	GAB	Mint 16-17	1	415V	XLPE	Copper	25	3	93
15.200	GAB	L D U 22 A	1	415V	XLPE	Copper	70	3	148
15.201	GAB	Gas Reducing Station	1	415V	XLPE	Copper	35	3	190
15.202	GAB	DTDH 1,2	2	415V	XLPE	copper	30	3	189
15.203	GAB3	Canteen	1	415V	XLPE	Copper	95	3	147
15.204	GAB3	Oil Filtration	1	415V	XLPE	Copper	70	3	51
15.205	GAB3	SAB No.3	4	415V	XLPE	Copper	35	3	70
15.206	GAB3	GAT3	10	415V	XLPE	Copper	70	3	52
15.207	Dist#2 415V Board	Condensate Motor A	1	415V	XLPE	Copper	35	4	46
15.208	Dist#2 415V Board	Condensate Motor A - control	1	240v	XLPE	Copper	1.5	24	55
15.209	Dist#2 415V Board	Condensate Motor B	1	415V	XLPE	Copper	35	4	44
15.210	Dist#2 415V Board	Condensate Motor B - control	1	240v	XLPE	Copper	1.5	24	57
15.211	Dist#2 415V Board	Desupper Heater Motor A	1	415V	XLPE	Copper	25	4	33
15.212	Dist#2 415V Board	Desupper Heater Motor A - control	1	240v	XLPE	Copper	1.5	24	43
15.213	Dist#2 415V Board	Desupper Heater Motor B	1	415V	XLPE	Copper	25	4	31
15.214	Dist#2 415V Board	Desupper Heater Motor B - control	1	240v	XLPE	Copper	1.5	24	42
15.215	Dist#2 415V Board	High-Purity motor A	1	415V	XLPE	Copper	25	4	20
15.216	Dist#2 415V Board	High-Purity motor A - control	1	240v	XLPE	Copper	1.5	24	30
15.217	Dist#2 415V Board	High-Purity motor B	1	415V	XLPE	Copper	25	4	22
15.218	Dist#2 415V Board	High-Purity motor B - control	1	240v	XLPE	Copper	1.5	24	34
15.219	Dist#2 415V Board	Caustic Soda	1	415V	XLPE	Copper	2.5	4	63
15.220	Dist#2 415V Board	Caustic Soda - control	1	240v	XLPE	Copper	1.5	24	74
15.221	Dist#2 415V Board	Sump Pump	1	415V	XLPE	Copper	2.5	4	34
15.222	Dist#2 415V Board	Sump Pump - control	1	240v	XLPE	Copper	1.5	24	31
15.223	Dist#2 415V Board	Anti-Scale A	1	415V	XLPE	Copper	2.5	4	40
15.224	Dist#2 415V Board	Anti-Scale A - control	1	240v	XLPE	Copper	1.5	24	46
15.225	Dist#2 415V Board	Anti-Scale B	1	415V	XLPE	Copper	2.5	4	42

15.226	Dist#2 415V Board	Anti-Scale B - control	1	240v	XLPE	Copper	1.5	24	54
15.227	Dist#2 415V Board	Anti-Scale New	1	415V	XLPE	Copper	2.5	4	39
15.228	Dist#2 415V Board	Anti-Scale New - control	1	240v	XLPE	Copper	1.5	24	39
15.229	Dist#2 415V Board	Sodium sulphite A	1	415V	XLPE	Copper	2.5	4	52
15.230	Dist#2 415V Board	Sodium sulphite A - control	1	240v	XLPE	Copper	1.5	24	63
15.231	Dist#2 415V Board	Sodium sulphite B	1	415V	XLPE	Copper	2.5	4	54
15.232	Dist#2 415V Board	Sodium sulphite B - control	1	240v	XLPE	Copper	1.5	24	65
15.233	Dist#2 415V Board	Tapproge Panel	1	415V	XLPE	Copper	2.5	4	27
15.234	Dist#2 415V Board	Tapproge Panel - control	1	240v	XLPE	Copper	1.5	24	38
15.235	Dist#2 415V Board	Sea water to Reject Valve	1	415V	XLPE	Copper	2.5	4	19
15.236	Dist#2 415V Board	Sea water to Reject Valve - control	1	240v	XLPE	Copper	1.5	24	29
15.237	Dist#2 415V Board	Anti-Scale Mixer 1	1	415V	XLPE	Copper	2.5	4	21
15.238	Dist#2 415V Board	Anti-Scale Mixer 1 - control	1	240v	XLPE	Copper	1.5	24	31
15.239	Dist#2 415V Board	Anti-Scale Mixer 2	1	415V	XLPE	Copper	2.5	4	19
15.240	Dist#2 415V Board	Anti-Scale Mixer 2 - control	1	240v	XLPE	Copper	1.5	24	30
15.241	Dist#2 415V Board	Anti-Foam Dosing 1	1	415V	XLPE	Copper	2.5	4	20
15.242	Dist#2 415V Board	Anti-Foam Dosing 1 - control	1	240v	XLPE	Copper	1.5	24	35
15.243	Dist#2 415V Board	Anti-Foam Dosing 2	1	415V	XLPE	Copper	2.5	4	23
15.244	Dist#2 415V Board	Anti-Foam Dosing 2 - control	1	240v	XLPE	Copper	1.5	24	29
15.245	Dist#2 415V Board	Caustic Soda Dosing 1	1	415V	XLPE	Copper	2.5	4	23
15.246	Dist#2 415V Board	Caustic Soda Dosing 1 - control	1	240v	XLPE	Copper	1.5	24	35
15.247	Dist#2 415V Board	Caustic Soda Dosing 2	1	415V	XLPE	Copper	2.5	4	26
15.248	Dist#2 415V Board	Caustic Soda Dosing 2 - control	1	240v	XLPE	Copper	1.5	24	35
15.249	Dist#2 415V Board	Acid Dosing	1	415V	XLPE	Copper	2.5	4	28
15.250	Dist#2 415V Board	Acid Dosing - control	1	240v	XLPE	Copper	1.5	24	35
15.251	Dist#2 415V Board	Caustic Soda Mixer	1	415V	XLPE	Copper	2.5	4	27
15.252	Dist#2 415V Board	Caustic Soda Mixer - control	1	240v	XLPE	Copper	1.5	24	38
15.253	Dist#2 415V Board	Anti-Foam Mixer	1	415V	XLPE	Copper	2.5	4	26
15.254	Dist#2 415V Board	Anti-Foam Mixer - control	1	240v	XLPE	Copper	1.5	24	33
15.255	Dist#2 415V Board	Sodium Sulphite Mixer 1	1	415V	XLPE	Copper	2.5	4	25
15.256	Dist#2 415V Board	Sodium Sulphite Mixer 1 - control	1	240v	XLPE	Copper	1.5	24	36
15.257	Dist#2 415V Board	Aux Power Supply	1	415V	XLPE	Copper	70	4	77
15.258	Dist#2 415V Board	Power Socket	1	415V	XLPE	Copper	35	4	18

15.259	Dist#2 415V Board	Lighting panel	1	415V	XLPE	Copper	70	4	26
15.260	Dist#2 415V Board	DC Battery Charger	1	415V	XLPE	Copper	70	4	104
15.261	Dist#2 415V Board	Sodium Sulphite Mixer 2	1	415V	XLPE	Copper	2.5	4	30
15.262	Dist#2 415V Board	Chemical Crane	1	415V	XLPE	Copper	20	4	23
15.263	Dist#2 415V Board	Air Compressor 1	1	415V	XLPE	Copper	35	4	40
15.264	Dist#2 415V Board	Air Compressor 1 - control	1	240v	XLPE	Copper	1.5	24	52
15.265	Dist#2 415V Board	Sea Water Filter A	1	415V	XLPE	Copper	25	4	100
15.266	Dist#2 415V Board	Sea Water Filter A - control	1	240v	XLPE	Copper	1.5	24	190
15.267	Dist#2 415V Board	Sea Water Filter B	1	415V	XLPE	Copper	25	4	106
15.268	Dist#2 415V Board	Sea Water Filter B - control	1	240v	XLPE	Copper	1.5	24	133
15.269	Dist#2 415V Board	Sea Water Section Valve	1	415V	XLPE	Copper	25	4	118
15.270	Dist#2 415V Board	Sea Water Section Valve - control	1	240v	XLPE	Copper	1.5	24	125
15.271	Dist#2 415V Board	Circulation Motor	1	415V	XLPE	Copper	2.5	4	12
15.272	Dist#2 415V Board	3 way Valve	1	415V	XLPE	Copper	2.5	4	8
15.273	Dist#2 415V Board	3 way Valve - control	1	240v	XLPE	Copper	1.5	24	15
15.274	Dist#2 415V Board	2 Way Valve	1	415V	XLPE	Copper	2.5	4	10
15.275	Dist#2 415V Board	2 Way Valve - control	1	240v	XLPE	Copper	1.5	24	20
15.276	Dist#2 415V Board	Screen Valve	1	415V	XLPE	Copper	25	4	22
15.277	Dist#2 415V Board	Screen Valve - control	1	240v	XLPE	Copper	1.5	24	31
15.278	Dist#2 415V Board	Vacuum Valve 1	1	415V	XLPE	Copper	2.5	4	55
15.279	Dist#2 415V Board	Vacuum Valve 1 - control	1	240v	XLPE	Copper	1.5	24	66
15.280	Dist#2 415V Board	Vacuum Valve 2	1	415V	XLPE	Copper	25	4	57
15.281	Dist#2 415V Board	Vacuum Valve 2 - control	1	240v	XLPE	Copper	1.5	24	68
15.282	Dist#2 415V Board	Vacuum Valve 3	1	415V	XLPE	Copper	2.5	4	67
15.283	Dist#2 415V Board	Vacuum Valve 3 - control	1	240v	XLPE	Copper	1.5	24	78
15.284	Dist#2 415V Board	Air Compressor 2	1	415V	XLPE	Copper	2.5	4	45
15.285	Dist#2 415V Board	Air Compressor 2 - control	1	240v	XLPE	Copper	1.5	24	54
15.286	Dist#2 415V Board	Dryer	1	415V	XLPE	Copper	2.5	4	39
15.287	Dist#2 415V Board	Dryer - control	1	240v	XLPE	Copper	1.5	24	48
15.288	Dist#2 415V Board	AC 1	1	415V	XLPE	Copper	4	4	13
15.289	Dist#2 415V Board	AC 1 - control	1	240v	XLPE	Copper	1.5	24	25
15.290	Dist#2 415V Board	AC 2	1	415V	XLPE	Copper	2	4	15
15.291	Dist#2 415V Board	AC 2 - control	1	240v	XLPE	Copper	1.5	24	25
15.292	Dist#2 415V Board	Crane 1	1	415V	XLPE	Copper	35	4	52

15.293	Dist#2 415V Board	Crane 1 - control	1	240v	XLPE	Copper	1.5	24	70
15.294	Dist#2 415V Board	Crane 2	1	415V	XLPE	Copper	35	4	60
15.295	Dist#2 415V Board	Crane 2 - control	1	240v	XLPE	Copper	1.5	24	70
15.296	Dist#2 415V Board	Crane 3	1	415V	XLPE	Copper	35	4	75
15.297	Dist#2 415V Board	Crane 3 - control	1	240v	XLPE	Copper	1.5	24	70
15.298	Dist#4 415V Board	Condensate Motor A	1	415V	XLPE	Copper	35	4	40
15.299	Dist#4 415V Board	Condensate Motor A - control	1	240v	XLPE	Copper	1.5	24	52
15.300	Dist#4 415V Board	Condensate Motor B	1	415V	XLPE	Copper	35	4	44
15.301	Dist#4 415V Board	Condensate Motor B - control	1	240v	XLPE	Copper	1.5	24	57
15.302	Dist#4 415V Board	Desupper Heater Motor A	1	415V	XLPE	Copper	2.5	4	22
15.303	Dist#4 415V Board	Desupper Heater Motor A - control	1	240v	XLPE	Copper	1.5	24	33
15.304	Dist#4 415V Board	Desupper Heater Motor B	1	415V	XLPE	Copper	2.5	4	24
15.305	Dist#4 415V Board	Desupper Heater Motor B - control	1	240v	XLPE	Copper	1.5	24	35
15.306	Dist#4 415V Board	High-Purity motor A	1	415V	XLPE	Copper	2.5	4	10
15.307	Dist#4 415V Board	High-Purity motor A - control	1	240	XLPE	Copper	1.5	24	15
15.308	Dist#4 415V Board	High-Purity motor B	1	415V	XLPE	Copper	2.5	4	11
15.309	Dist#4 415V Board	High-Purity motor B - control	1	240	XLPE	Copper	1.5	24	21
15.310	Dist#4 415V Board	Caustic Soda	1	415V	XLPE	Copper	2.5	4	63
15.311	Dist#4 415V Board	Sump Pump	1	415V	XLPE	Copper	2.5	4	25
15.312	Dist#4 415V Board	Sump Pump - control	1	240v	XLPE	Copper	1.5	24	25
15.313	Dist#4 415V Board	Anti-Scale A	1	415V	XLPE	Copper	2.5	4	20
15.314	Dist#4 415V Board	Anti-Scale A - control	1	240v	XLPE	Copper	1.5	24	31
15.315	Dist#4 415V Board	Anti-Scale B	1	415V	XLPE	Copper	2.5	4	20
15.316	Dist#4 415V Board	Anti-Scale B - control	1	240v	XLPE	Copper	1.5	24	31
15.317	Dist#4 415V Board	Anti-Scale New	1	415V	XLPE	Copper	2.5	4	39
15.318	Dist#4 415V Board	Sodium sulphite A	1	415V	XLPE	Copper	2.5	4	52
15.319	Dist#4 415V Board	Sodium sulphite A - control	1	240v	XLPE	Copper	1.5	24	27
15.320	Dist#4 415V Board	Sodium sulphite B	1	415V	XLPE	Copper	2.5	4	54
15.321	Dist#4 415V Board	Sodium sulphite B - control	1	240v	XLPE	Copper	1.5	24	28
15.322	Dist#4 415V Board	Tapproge Panel	1	415V	XLPE	Copper	2.5	4	26
15.323	Dist#4 415V Board	Tapproge Panel - control	1	240v	XLPE	Copper	1.5	24	37
15.324	Dist#4 415V Board	Sea water to Reject Valve	1	415V	XLPE	Copper	2.5	4	20
15.325	Dist#4 415V Board	Sea water to Reject Valve - control	1	240	XLPE	Copper	1.5	24	32

15.326	Dist#4 415V Board	Anti-Scale Mixer 1	1	415V	XLPE	Copper	2.5	4	21
15.327	Dist#4 415V Board	Anti-Scale Mixer 1 - control	1	240v	XLPE	Copper	1.5	24	33
15.328	Dist#4 415V Board	Anti-Scale Mixer 2	1	415V	XLPE	Copper	2.5	4	19
15.329	Dist#4 415V Board	Anti-Scale Mixer 2 - control	1	240v	XLPE	Copper	1.5	24	27
15.330	Dist#4 415V Board	Anti Foam Dosing 1	1	415V	XLPE	Copper	2.5	4	20
15.331	Dist#4 415V Board	Anti-Foam Dosing 1 - control	1	240v	XLPE	Copper	1.5	24	29
15.332	Dist#4 415V Board	Anti-Foam Dosing 2	1	415V	XLPE	Copper	2.5	4	23
15.333	Dist#4 415V Board	Anti-Foam Dosing 2 - control	1	240v	XLPE	Copper	1.5	24	32
15.334	Dist#4 415V Board	Caustic Soda Dosing 1	1	415V	XLPE	Copper	2.5	4	23
15.335	Dist#4 415V Board	Caustic Soda Dosing 1 - control	1	240v	XLPE	Copper	1.5	24	32
15.336	Dist#4 415V Board	Caustic Soda Dosing 2	1	415V	XLPE	Copper	2.5	4	26
15.337	Dist#4 415V Board	Caustic Soda Dosing 2 - control	1	240v	XLPE	Copper	1.5	24	37
15.338	Dist#4 415V Board	Acid Dosing	1	415V	XLPE	Copper	2.5	4	28
15.339	Dist#4 415V Board	Acid Dosing - control	1	240v	XLPE	Copper	1.5	24	33
15.340	Dist#4 415V Board	Caustic Soda Mixer	1	415V	XLPE	Copper	2.5	4	27
15.341	Dist#4 415V Board	Caustic Soda Mixer - control	1	240v	XLPE	Copper	1.5	4	40
15.342	Dist#4 415V Board	Anti-Foam Mixer	1	415V	XLPE	Copper	2.5	4	26
15.343	Dist#4 415V Board	Anti-Foam Mixer - control	1	240v	XLPE	Copper	1.5	24	39
15.344	Dist#4 415V Board	Sodium Sulphite Mixer 1	1	415V	XLPE	Copper	2.5	4	25
15.345	Dist#4 415V Board	Sodium Sulphite Mixer 1 - control	1	240v	XLPE	Copper	1.5	24	41
15.346	Dist#4 415V Board	Sodium Sulphite Mixer 2	1	415V	XLPE	Copper	2.5	4	30
15.347	Dist#4 415V Board	Sodium Sulphite Mixer 2 - control	1	240v	XLPE	Copper	1.5	24	35
15.348	Dist#4 415V Board	Chemical Crane	1	415V	XLPE	Copper	2.5	4	23
15.349	Dist#4 415V Board	Chemical Crane - control	1	240v	XLPE	Copper	1.5	24	33
15.350	Dist#4 415V Board	Air Compressor 1	1	415V	XLPE	Copper	35	4	40
15.351	Dist#4 415V Board	Air Compressor 1 - control	1	240v	XLPE	Copper	1.5	24	50
15.352	Dist#4 415V Board	Sea Water Filter A	1	415V	XLPE	Copper	2.5	4	100
15.353	Dist#4 415V Board	Sea Water Filter A - control	1	240v	XLPE	Copper	1.5	24	109
15.354	Dist#4 415V Board	Sea Water Filter B	1	415V	XLPE	Copper	2.5	4	106
15.355	Dist#4 415V Board	Sea Water Filter B - control	1	240v	XLPE	Copper	1.5	24	120
15.356	Dist#4 415V Board	Sea Water Section Valve	1	415V	XLPE	Copper	2.5	4	118
15.357	Dist#4 415V Board	Sea Water Section Valve	1	240v	XLPE	Copper	1.5	24	135
15.358	Dist#4 415V Board	Circulation Motor	1	415V	XLPE	Copper	2.5	4	12

15.359	Dist#4 415V Board	Circulation Motor - control	1	240v	XLPE	Copper	1.5	24	22
15.360	Dist#4 415V Board	3 way Valve	1	415V	XLPE	Copper	2.5	4	8
15.361	Dist#4 415V Board	3 way Valve - control	1	240v	XLPE	Copper	1.5	24	15
15.362	Dist#4 415V Board	2 Way Valve	1	415V	XLPE	Copper	2.5	4	10
15.363	Dist#4 415V Board	2 Way Valve - control	1	240v	XLPE	Copper	1.5	24	17
15.364	Dist#4 415V Board	Screen Valve	1	415V	XLPE	Copper	2.5	4	22
15.365	Dist#4 415V Board	Screen Valve - control	1	240v	XLPE	Copper	1.5	24	35
15.366	Dist#4 415V Board	Vacuum Valve 1	1	415V	XLPE	Copper	2.5	4	55
15.367	Dist#4 415V Board	Vacuum Valve 1 - control	1	240v	XLPE	Copper	1.5	24	70
15.368	Dist#4 415V Board	Vacuum Valve 2	1	415V	XLPE	Copper	2.5	4	57
15.369	Dist#4 415V Board	Vacuum Valve 2 - control	1	240v	XLPE	Copper	1.5	24	75
15.370	Dist#4 415V Board	Vacuum Valve 3	1	415V	XLPE	Copper	2.5	4	67
15.371	Dist#4 415V Board	Vacuum Valve 3 - control	1	240v	XLPE	Copper	1.5	24	80
15.372	Dist#4 415V Board	Air Compressor 2	1	415V	XLPE	Copper	35	4	45
15.373	Dist#4 415V Board	Air Compressor 2 - control	1	240v	XLPE	Copper	1.5	24	60
15.374	Dist#4 415V Board	Dryer	1	415V	XLPE	Copper	2.5	4	39
15.375	Dist#4 415V Board	Dryer - control	1	240v	XLPE	Copper	1.5	24	57
15.376	Dist#4 415V Board	AC 1	1	415V	XLPE	Copper	4	4	13
15.377	Dist#4 415V Board	AC 2	1	415V	XLPE	Copper	4	4	15
15.378	Dist#4 415V Board	Crane 1	1	415V	XLPE	Copper	35	4	52
15.379	Dist#4 415V Board	Crane 1 - control	1	240v	XLPE	Copper	1.5	24	71
15.380	Dist#4 415V Board	Crane 2	1	415V	XLPE	Copper	35	4	60
15.381	Dist#4 415V Board	Crane 2 - control	1	240v	XLPE	Copper	1.5	24	71
15.382	Dist#4 415V Board	Crane 3	1	415V	XLPE	Copper	35	4	75
15.383	Dist#4 415V Board	Crane 3 - control	1	240v	XLPE	Copper	1.5	24	70
15.384	Dist#4 415V Board	Lighting Panel	1	415V	XLPE	Copper	6	4	18
15.385	Dist#4 415V Board	220 DC battery	1	415V	XLPE	Copper	70	4	93
15.386	Dist#4 415V Board	Power socket	1	415V	XLPE	Copper	4	4	16
15.387	Dist#3 415V Board	Condensate Motor A	1	415V	XLPE	Copper	35	4	46
15.388	Dist#3 415V Board	Condensate Motor A - control	1	240v	XLPE	Copper	1.5	24	70
15.389	Dist#3 415V Board	Condensate Motor B	1	415V	XLPE	Copper	35	4	45
15.390	Dist#3 415V Board	Condensate Motor B - control	1	240v	XLPE	Copper	1.5	24	65
15.391	Dist#3 415V Board	Desupper Heater Motor A	1	415V	XLPE	Copper	2.5	4	33
15.392	Dist#3 415V Board	Desupper Heater Motor A - control	1	240	XLPE	Copper	1.5	24	53

15.393	Dist#3 415V Board	Desupper Heater Motor B	1	415V	XLPE	Copper	2.5	4	31
15.394	Dist#3 415V Board	Desupper Heater Motor B - control	1	240	XLPE	Copper	1.5	24	51
15.395	Dist#3 415V Board	High-Purity motor A	1	415V	XLPE	Copper	2.5	4	28
15.396	Dist#3 415V Board	High-Purity motor A - control	1	240v	XLPE	Copper	1.5	24	50
15.397	Dist#3 415V Board	High-Purity motor B	1	415V	XLPE	Copper	2.5	4	30
15.398	Dist#3 415V Board	High-Purity motor B - control	1	240v	XLPE	Copper	1.5	24	50
15.399	Dist#3 415V Board	Caustic Soda	1	415V	XLPE	Copper	2.5	4	60
15.400	Dist#3 415V Board	Caustic Soda - control	1	240v	XLPE	Copper	1.5	24	80
15.401	Dist#3 415V Board	Sump Pump	1	415V	XLPE	Copper	2.5	4	30
15.402	Dist#3 415V Board	Sump Pump - control	1	240v	XLPE	Copper	1.5	24	50
15.403	Dist#3 415V Board	Anti-Scale A	1	415V	XLPE	Copper	2.5	4	40
15.404	Dist#3 415V Board	Anti-Scale A - control	1	240v	XLPE	Copper	1.5	24	60
15.405	Dist#3 415V Board	Anti-Scale B	1	415V	XLPE	Copper	2.5	4	42
15.406	Dist#3 415V Board	Anti-Scale B - control	1	240v	XLPE	Copper	1.5	24	62
15.407	Dist#3 415V Board	Sodium sulphite A	1	415V	XLPE	Copper	2.5	4	51
15.408	Dist#3 415V Board	Sodium sulphite A - control	1	240v	XLPE	Copper	1.5	24	71
15.409	Dist#3 415V Board	Sodium sulphite B	1	415V	XLPE	Copper	2.5	4	53
15.410	Dist#3 415V Board	Sodium sulphite B - control	1	240v	XLPE	Copper	1.5	24	80
15.411	Dist#3 415V Board	Tapproge Panel	1	415V	XLPE	Copper	2.5	4	26
15.412	Dist#3 415V Board	Tapproge Panel - control	1	240v	XLPE	Copper	1.5	24	46
15.413	Dist#3 415V Board	Sea water to Reject Valve	1	415V	XLPE	Copper	2.5	4	20
15.414	Dist#3 415V Board	Sea water to Reject Valve - control	1	240v	XLPE	Copper	1.5	24	40
15.415	Dist#3 415V Board	Anti-Scale Mixer 1	1	415V	XLPE	Copper	2.5	4	32
15.416	Dist#3 415V Board	Anti-Scale Mixer 1 - control	1	240v	XLPE	Copper	1.5	24	50
15.417	Dist#3 415V Board	Anti-Scale Mixer 2	1	415V	XLPE	Copper	2.5	4	37
15.418	Dist#3 415V Board	Anti-Scale Mixer 2 - control	1	240v	XLPE	Copper	1.5	24	50
15.419	Dist#3 415V Board	Anti-Foam Dosing 1	1	415V	XLPE	Copper	2.5	4	46
15.420	Dist#3 415V Board	Anti-Foam Dosing 1 - control	1	240v	XLPE	Copper	1.5	24	65
15.421	Dist#3 415V Board	Anti-Foam Dosing 2	1	415V	XLPE	Copper	2.5	4	48
15.422	Dist#3 415V Board	Anti-Foam Dosing 2 - control	1	240v	XLPE	Copper	1.5	24	70
15.423	Dist#3 415V Board	Caustic Soda Dosing 1	1	415V	XLPE	Copper	2.5	4	50
15.424	Dist#3 415V Board	Caustic Soda Dosing 1 - control		240v	XLPE	Copper	1.5	24	55
15.425	Dist#3 415V Board	Caustic Soda Dosing 2	1	415V	XLPE	Copper	2.5	4	52

15.426	Dist#3 415V Board	Caustic Soda Dosing 2 - control		240v	XLPE	Copper	1.5	24	57
15.427	Dist#3 415V Board	Acid Dosing A	1	415V	XLPE	Copper	2.5	4	50
15.428	Dist#3 415V Board	Acid Dosing A - control	1	240V	XLPE	Copper	1.5	24	74
15.429	Dist#3 415V Board	Acid Dosing B	1	415V	XLPE	Copper	2.5	4	50
15.430	Dist#3 415V Board	Acid Dosing B - control	1	240v	XLPE	Copper	1.5	24	75
15.431	Dist#3 415V Board	Caustic Soda Mixer	1	415V	XLPE	Copper	2.5	4	52
15.432	Dist#3 415V Board	Anti-Foam Mixer	1	415V	XLPE	Copper	2.5	4	56
15.433	Dist#3 415V Board	Sodium Sulphite Mixer 1	1	415V	XLPE	Copper	2.5	4	54
15.434	Dist#3 415V Board	Sodium Sulphite Mixer 1 - control	1	240v	XLPE	Copper	1.5	24	70
15.435	Dist#3 415V Board	Sodium Sulphite Mixer 2	1	415V	XLPE	Copper	2.5	4	56
15.436	Dist#3 415V Board	Sodium Sulphite Mixer 2 - control	1	240v	XLPE	Copper	1.5	24	70
15.437	Dist#3 415V Board	Chemical Crane	1	415V	XLPE	Copper	2.5	4	20
15.438	Dist#3 415V Board	Chemical Crane - control	1	240v	XLPE	Copper	1.5	24	33
15.439	Dist#3 415V Board	Sea Water Filter A	1	415V	XLPE	Copper	2.5	4	95
15.440	Dist#3 415V Board	Sea Water Filter A - control	1	240v	XLPE	Copper	1.5	24	120
15.441	Dist#3 415V Board	Sea Water Filter B	1	415V	XLPE	Copper	2.5	4	99
15.442	Dist#3 415V Board	Sea Water Filter B - control	1	240v	XLPE	Copper	1.5	24	120
15.443	Dist#3 415V Board	Sea Water Section Valve	1	415V	XLPE	Copper	2.5	4	120
15.444	Dist#3 415V Board	Sea Water Section Valve - control	1	240v	XLPE	Copper	1.5	24	130
15.445	Dist#3 415V Board	Circulation Motor	1	415V	XLPE	Copper	2.5	4	10
15.446	Dist#3 415V Board	Circulation Motor - control	1	240v	XLPE	Copper	1.5	24	35
15.447	Dist#3 415V Board	3 way Valve	1	415V	XLPE	Copper	2.5	4	7
15.448	Dist#3 415V Board	3 way Valve - control	1	240v	XLPE	Copper	1.5	24	9
15.449	Dist#3 415V Board	2 Way Valve	1	415V	XLPE	Copper	2.5	4	9
15.450	Dist#3 415V Board	2 Way Valve - control	1	240v	XLPE	Copper	1.5	24	25
15.451	Dist#3 415V Board	Screen Valve	1	415V	XLPE	Copper	2.5	4	22
15.452	Dist#3 415V Board	Screen Valve - control	1	240v	XLPE	Copper	1.5	24	40
15.453	Dist#3 415V Board	Vacuum Valve 1	1	415V	XLPE	Copper	2.5	4	55
15.454	Dist#3 415V Board	Vacuum Valve 1 - control	1	240v	XLPE	Copper	1.5	24	70
15.455	Dist#3 415V Board	Vacuum Valve 2	1	415V	XLPE	Copper	2.5	4	57
15.456	Dist#3 415V Board	Vacuum Valve 2 - control	1	240v	XLPE	Copper	1.5	24	75
15.457	Dist#3 415V Board	Vacuum Valve 3	1	415V	XLPE	Copper	2.5	4	67
15.458	Dist#3 415V Board	Vacuum Valve 3 - control	1	240v	XLPE	Copper	1.5	24	80

15.459	Dist#3 415V Board	Lighting Panel	1	415V	XLPE	Copper	4	4	66
15.460	Dist#3 415V Board	Supply to Operator Room	1	415V	XLPE	Copper	4	4	15
15.461	Dist#3 415V Board	Lighting Panel	1	415V	XLPE	Copper	6	4	15
15.462	Dist#3 415V Board	AC 1	1	415V	XLPE	Copper	4	4	13
15.463	Dist#3 415V Board	AC 2	1	415V	XLPE	Copper	4	4	15
15.464	Dist#3 415V Board	Crane 1	1	415V	XLPE	Copper	35	4	52
15.465	Dist#3 415V Board	Crane 1 - control	1	240v	XLPE	Copper	1.5	24	55
15.466	Dist#3 415V Board	Crane 2	1	415V	XLPE	Copper	35	4	60
15.467	Dist#3 415V Board	Crane 2 - control	1	240v	XLPE	Copper	1.5	24	63
15.468	Dist#3 415V Board	Crane 3	1	415V	XLPE	Copper	35	4	75
15.469	Dist#3 415V Board	Crane 3 - control	1	240v	XLPE	Copper	1.5	24	78
15.470	1 DC 1 board	Hydro Board	1	415V	XLPE	Copper	50	3	177
15.471	1 DC 1 board	Hydro Board - control	1	240v	XLPE	Copper	1.5	44	177
15.472	1 DC 1 board	Hydro Board	1	415V	XLPE	Copper	50	3	177
15.473	1 DC 1 board	Hydro Board - control	1	240v	XLPE	Copper	1.5	44	177
15.474	Hydro Board	Air Purging Fan	1	415V	XLPE	Copper	2.5	4	10
15.475	Hydro Board	Air Purging Fan - control	1	240v	XLPE	Copper	2.5	12	10
15.476	Hydro Board	Air Purging Fan - control	1	240v	XLPE	Copper	1.5	8	10
15.477	Hydro Board	Screen Motor	1	415V	XLPE	Copper	2.5	4	25
15.478	Hydro Board	Exhaust Fan	1	415V	XLPE	Copper	2.5	4	17
15.479	Hydro Board	Exhaust Fan - control	1	240v	XLPE	Copper	1.5	8	17
15.480	Hydro Board	Chlorination Pump A	1	415V	XLPE	Copper	2.5	4	12.5
15.481	Hydro Board	Chlorination Pump A - control	1	240v	XLPE	Copper	2.5	12	12.5
15.482	Hydro Board	Chlorination Pump A - control	1	240v	XLPE	Copper	1.5	8	12.5
15.483	Hydro Board	Chlorination Pump B	1	415V	XLPE	Copper	2.5	4	12
15.484	Hydro Board	Chlorination Pump B - control	1	240v	XLPE	Copper	2.5	12	12
15.485	Hydro Board	Chlorination Pump B - control	1	240v	XLPE	Copper	1.5	8	12
15.486	Hydro Board	Acid Cleaning B	1	415V	XLPE	Copper	2.5	4	10
15.487	Hydro Board	Acid Cleaning B - control	1	240v	XLPE	Copper	2.5	20	20
15.488	Hydro Board	Air Purging Fan	1	415V	XLPE	Copper	2.5	4	8
15.489	Hydro Board	Air Purging Fan - control	1	240v	XLPE	Copper	2.5	12	8
15.490	Hydro Board	Air Purging Fan - control	1	240v	XLPE	Copper	1.5	8	8
15.491	Hydro Board	Acid Cleaning A	1	415V	XLPE	Copper	2.5	4	8
15.492	Hydro Board	Acid Cleaning A - control	1	240v	XLPE	Copper	2.5	20	16
15.493	Hydro Board	Cathodic Protection panel	1	415V	XLPE	Copper	10	4	11

15.494	Hydro Board	Cathodic Protection panel - control	1	240v	XLPE	Copper	2.5	4	11
15.495	Hydro Board	Screen Wash Pump	1	415V	XLPE	Copper	30	4	31
15.496	Hydro Board	Screen Wash Pump - control	1	240v	XLPE	Copper	1.5	12	36
15.497	Hydro Board	Jumbo Pump	1	415V	XLPE	Copper	70	4	27
15.498	Hydro Board	Chlorination Pump	1	415V	XLPE	Copper	2.5	4	19
15.499	Hydro Board	Chlorination Pump - control	1	240v	XLPE	Copper	1.5	24	35
15.500	Hydro Board	Rectifier	1	415V	XLPE	Copper	4	4	11
15.501	Hydro Board	M.M.S Workshop	1	415V	XLPE	Copper	25	4	40
15.502	Hydro Board	Lighting Panel	1	415V	XLPE	Copper	35	4	17
15.503	Hydro Board	M.M.S Workshop	1	415V	XLPE	Copper	25	4	45
15.504	Hydro Board	Spray Wash Pump	1	415V	XLPE	Copper	35	4	36
15.505	Hydro Board	Spray Wash Pump - control	1	240v	XLPE	Copper	1.5	20	70
15.506	Hydro Board	Power Tools Socket	1	415V	XLPE	Copper	10	4	24
15.507	Hydro Board	A.C Fan for Hydro	1	415V	XLPE	Copper	25	4	11
15.508	Hydro Board	Booster Pump	1	415V	XLPE	Copper	2.5	4	25
15.509	Hydro Board	Local Panel	1	415V	XLPE	Copper	25	4	26
15.510	Hydro Board	Heater Panel 1	1	415V	XLPE	Copper	10	4	26
15.511	Hydro Board	AC-UA (PAC)	1	415V	XLPE	Copper	25	4	20
15.512	Hydro Board	Local Panel	1	415V	XLPE	Copper	25	4	14
15.513	Hydro Board	Travelling Bridge	1	415V	XLPE	Copper	35	4	38
15.514	Hydro Board	Lighting panel	1	415V	XLPE	Copper	25	4	20
15.515	Hydro Board	ACU-4B	1	415V	XLPE	Copper	50	4	12
15.516	Hydro Board	Travel Screen	1	415V	XLPE	Copper	10	4	35
15.517	Hydro Board	Acid Cleaning	1	415V	XLPE	Copper	25	4	23
15.518	Hydro Board	Heater panel 2	1	415V	XLPE	Copper	10	4	26
15.519	1BT1	Unit 5 3.3KV Board	10	3.3KV	XLPE	Copper	300	1	28
15.520	1BT - Control	Unit 5 3.3KV Board	1	415v	XLPE	Copper	2.5	44	28
15.521	1BT2	Unit 5 3.3KV Board	9	3.3KV	XLPE	Copper	300	4	18
15.522	1BT2 - Control	Unit 5 3.3KV Board	1	415v	XLPE	Copper	1.5	44	18
15.523	Unit 5 3.3KV Board	3CT2	1	3.3KV	XLPE	Copper	85	3	158
15.524	Unit 5 3.3KV Board	3CT2 - control	1	415v	XLPE	Copper	1.5	44	158
15.525	Unit 5 3.3KV Board	1CT2	1	3.3kv	XLPE	Copper	240	3	35
15.526	Unit 5 3.3KV Board	1CT2 - Control	1	415v	XLPE	Copper	1.5	44	35
15.527	Unit 5 3.3KV Board	1CT1	1	3.3kv	XLPE	Copper	240	3	24

15.528	Unit 5 3.3KV Board	1CT1 - Control	1	415v	XLPE	Copper	1.5	44	24
15.529	Unit 5 3.3KV Board	3CT1	1	3.3KV	XLPE	Copper	85	3	164
15.530	Unit 5 3.3KV Board	3CT1 - Control	1	415v	XLPE	Copper	1.5	44	164
15.531	Unit 5 3.3KV Board	2CT1	1	3.3KV	XLPE	Copper	240	3	118
15.532	Unit 5 3.3KV Board	2CT1 - Control	1	415v	XLPE	Copper	1.5	44	118
15.533	Unit 5 3.3KV Board	FD Fan Motor	3	3.3kv	XLPE	Copper	185	1	125
15.534	Unit 5 3.3KV Board	FD Fan Motor - control	1	415v	XLPE	Copper	1.5	10	125
15.535	Unit 5 3.3KV Board	Sea water Supply Motor A	3	3.3KV	XLPE	Copper	300	1	151
15.536	Unit 5 3.3KV Board	Sea water Supply Motor A - Control	1	415v	XLPE	Copper	2.5	44	151
15.537	Unit 5 3.3KV Board	Sea water Supply Motor B	3	3.3KV	XLPE	Copper	300	1	142
15.538	Unit 5 3.3KV Board	Sea water Supply Motor B - Control	1	415v	XLPE	Copper	2.5	44	142
15.539	Unit 5 3.3KV Board	Distillate motor A	1	3.3KV	XLPE	Copper	120	3	116
15.540	Unit 5 3.3KV Board	Distillate motor A - control	1	415v	XLPE	Copper	2.5	44	116
15.541	Unit 5 3.3KV Board	Distillate motor B	1	3.3KV	XLPE	Copper	120	3	128
15.542	Unit 5 3.3KV Board	Distillate motor B - control	1	415v	XLPE	Copper	2.5	44	128
15.543	Unit 5 3.3KV Board	Feed Pump A	1	3.3KV	XLPE	Copper	240	3	29
15.544	Unit 5 3.3KV Board	Feed Pump A - control	1	415v	XLPE	Copper	2.5	44	29
15.545	Unit 5 3.3KV Board	Feed Pump B	1	3.3KV	XLPE	Copper	240	3	41
15.546	Unit 5 3.3KV Board	Feed Pump B - control	1	415v	XLPE	Copper	2.5	44	41
15.547	GT1	66KV Substation	1	66KV	XLPE	Copper	300	1	130
15.548	GT2	66KV Substation	1	66KV	XLPE	Copper	300	1	127
15.549	GT3	66KV Substation	1	66KV	XLPE	Copper	300	1	125
15.550	GT4	66KV Substation	1	66KV	XLPE	Copper	300	1	126
15.551	1DA2	1DE1	1	415V	XLPE	Copper	70	4	370
15.552	GAB1	Distillate pump house	1	415V	XLPE	Copper	95	4	220
15.553	GAB2	Distillate pump house	1	415V	XLPE	Copper	95	4	45
15.554	Distillate pump house	Crane	1	415V	XLPE	Copper	6	4	9
15.555	Distillate pump house	Lighting	1	415V	XLPE	Copper	2.5	4	42
15.556	Distillate pump house	Sodium Birbont	1	415V	XLPE	Copper	2.5	4	44
15.557	Distillate pump house	Dosing pump p5/6	1	415V	XLPE	Copper	2.5	4	22
15.558	Distillate pump house	Sodium Birbont	1	415V	XLPE	Copper	2.5	4	23
15.559	Distillate pump house	lap	1	415V	XLPE	Copper	4	4	24
15.560	Distillate pump house	AC 2	1	415V	XLPE	Copper	4	4	20

15.561	Distillate pump house	AC1	1	415V	XLPE	Copper	4	4	45
15.562	Distillate pump house	Maintenance socket outlet	1	415V	XLPE	Copper	25	4	35
15.563	Distillate pump house	Store Lighting	1	415V	XLPE	Copper	6	4	15
15.564	Distillate pump house	W/W Lighting	1	415V	XLPE	Copper	6	4	55
15.565	U.A.B No.1	Booster pump A	1	415V	XLPE	Copper	6	4	65
15.566	U.A.B No.1	Booster pump A - Control	1	240V	XLPE	Copper	2.5	5	80
15.567	U.A.B No.1	Booster pump B	1	415V	XLPE	Copper	6	4	65
15.568	U.A.B No.1	Booster pump B - Control	1	240V	XLPE	Copper	2.5	5	80
15.569	U.A.B No.1	Throttle Valve	1	415V	XLPE	Copper	2.5	5	30
15.570	U.A.B No.1	Cooling Ignition Fan	1	415V	XLPE	Copper	6	4	80
15.571	U.A.B No.2	Cooling Ignition Fan - control	1	240V	XLPE	Copper	2.5	5	40
15.572	U.A.B No.1	Condensate Pass out Valve	1	415V	XLPE	Copper	2.5	4	42
15.573	U.A.B No.1	Live Steam Bypass Valve	1	415V	XLPE	Copper	2.5	4	55
15.574	U.A.B No.1	Live Steam Stop Valve	1	415V	XLPE	Copper	2.5	4	55
15.575	U.A.B No.1	Sump Pump	1	415V	XLPE	Copper	2.5	4	60
15.576	U.A.B No.1	Turning Gear Motor	1	415V	XLPE	Copper	6	4	43
15.577	U.A.B No.1	Turning Gear Motor - control	1	240v	XLPE	Copper	2.5	5	40
15.578	U.A.B No.1	Turing Gear Oil Pump	1	415V	XLPE	Copper	6	4	30
15.579	U.A.B No.1	Turing Gear Oil Pump - control	1	240v	XLPE	Copper	2.5	5	30
15.580	U.A.B No.1	Oil Vapor Fan 1A	1	415V	XLPE	Copper	2.5	4	30
15.581	U.A.B No.1	Oil Vapor Fan 1A - Control	1	240v	XLPE	Copper	2.5	5	30
15.582	U.A.B No.1	Aux. Oil Pump	1	415V	XLPE	Copper	25	3	30
15.583	U.A.B No.2	Aux. Oil Pump - control	1	240v	XLPE	Copper	2.5	5	30
15.584	U.A.B No.1	Gland Condenser Fan A	1	415V	XLPE	Copper	2.5	4	30
15.585	U.A.B No.1	Gland Condenser Fan A - control	1	240v	XLPE	Copper	2.5	5	30
15.586	U.A.B No.1	Gland Condenser Fan B	1	415V	XLPE	Copper	2.5	4	30
15.587	U.A.B No.1	Gland Condenser Fan B - control	1	240v	XLPE	Copper	2.5	5	30
15.588	U.A.B No.1	Condensate Ext. pump A	1	415V	XLPE	Copper	50	3	50
15.589	U.A.B No.1	Condensate Ext. pump A - control	1	240v	XLPE	Copper	2.5	5	50
15.590	U.A.B No.1	Condensate Ext. pump B	1	415V	XLPE	Copper	50	3	45
15.591	U.A.B No.1	Condensate Ext. pump B - Control	1	240v	XLPE	Copper	2.5	5	45
15.592	U.A.B No.1	Cooling Water pump A	1	415V	XLPE	Copper	2.5	3	48

15.593	U.A.B No.1	Cooling Water pump A - Control	1	240v	XLPE	Copper	2.5	5	48
15.594	U.A.B No.1	Cooling Water pump B	1	415V	XLPE	Copper	150	3	65
15.595	U.A.B No.1	Cooling Water pump B - Control	1	240v	XLPE	Copper	2.5	5	50
15.596	U.A.B No.1	Lube Oil Purifier	1	415V	XLPE	Copper	70	3	33
15.597	U.A.B No.1	Boiler 1 Lighting	1	415V	XLPE	Copper	25	3	30
15.598	U.A.B No.1	G.Tx No.1 Aux. Board	1	415V	XLPE	Copper	10	5	65
15.599	U.A.B No.1	Excitation System	1	415V	XLPE	Copper	4	4	70
15.600	U.A.B No.1	Excitation System	1	415V	XLPE	Copper	2.5	3	70
15.601	U.A.B No.1	Damper Control Panel	1	415V	XLPE	Copper	4	4	50
15.602	U.A.Tx No. 1	U.A.B No.1	7	415V	XLPE	Copper	400	1	35
15.603	U.A.B No.2	Booster pump A	1	415V	XLPE	Copper	6	4	65
15.604	U.A.B No.2	Booster pump A - Control	1	240v	XLPE	Copper	2.5	5	100
15.605	U.A.B No.2	Booster pump B	1	415V	XLPE	Copper	6	4	65
15.606	U.A.B No.2	Booster pump B - Control	1	240v	XLPE	Copper	2.5	5	100
15.607	U.A.B No.2	Throttle Valve	1	415V	XLPE	Copper	2.5	5	30
15.608	U.A.B No.2	Cooling Ignition Fan	1	415V	XLPE	Copper	6	4	80
15.609	U.A.B No.2	Cooling Ignition Fan - control	1	240c	XLPE	Copper	2.5	5	60
15.610	U.A.B No.2	Condensate Pass out Valve	1	415V	XLPE	Copper	2.5	4	42
15.611	U.A.B No.2	Live Steam Bypass Valve	1	415V	XLPE	Copper	2.5	4	55
15.612	U.A.B No.2	Live Steam Stop Valve	1	415V	XLPE	Copper	2.5	4	55
15.613	U.A.B No.2	Sump Pump	1	415V	XLPE	Copper	2.5	4	60
15.614	U.A.B No.2	Turning Gear Motor	1	415V	XLPE	Copper	6	4	43
15.615	U.A.B No.2	Turning Gear Motor - control	1	240v	XLPE	Copper	2.5	4	40
15.616	U.A.B No.2	Turing Gear Oil Pump	1	415V	XLPE	Copper	6	4	30
15.617	U.A.B No.2	Turing Gear Oil Pump - control	1	240v	XLPE	Copper	2.5	5	30
15.618	U.A.B No.2	Oil Vapor Fan 2A	1	415V	XLPE	Copper	2.5	4	30
15.619	U.A.B No.2	Oil Vapor Fan 2A - Control	1	240v	XLPE	Copper	2.5	5	30
15.620	U.A.B No.2	Aux. Oil Pump	1	415V	XLPE	Copper	25	3	30
15.621	U.A.B No.2	Aux. Oil Pump - control	1	240v	XLPE	Copper	2.5	5	30
15.622	U.A.B No.2	Gland Condenser Fan A	1	415V	XLPE	Copper	2.5	4	30
15.623	U.A.B No.2	Gland Condenser Fan A - control	1	240v	XLPE	Copper	2.5	5	30
15.624	U.A.B No.2	Gland Condenser Fan B	1	415V	XLPE	Copper	2.5	4	30
15.625	U.A.B No.2	Gland Condenser Fan B - control	1	240v	XLPE	Copper	2.5	5	30

15.626	U.A.B No.2	Condensate Ext. pump A	1	415V	XLPE	Copper	50	3	50
15.627	U.A.B No.2	Condensate Ext. pump A - control	1	240v	XLPE	Copper	2.5	5	50
15.628	U.A.B No.2	Condensate Ext. pump B	1	415V	XLPE	Copper	50	3	45
15.629	U.A.B No.2	Condensate Ext. pump B - Control	1	240v	XLPE	Copper	2.5	5	45
15.630	U.A.B No.2	Cooling Water pump A	1	415V	XLPE	Copper	150	3	48
15.631	U.A.B No.2	Cooling Water pump A - Control	1	240v	XLPE	Copper	2.5	5	48
15.632	U.A.B No.2	Cooling Water pump B	1	415V	XLPE	Copper	150	3	65
15.633	U.A.B No.2	Cooling Water pump B - Control	1	240v	XLPE	Copper	2.5	5	45
15.634	U.A.B No.2	Lube Oil Purifier	1	415V	XLPE	Copper	70	3	33
15.635	U.A.B No.2	Boiler 1 Lighting	1	415V	XLPE	Copper	25	3	30
15.636	U.A.B No.2	G.Tx No.2 Aux. Board	1	415V	XLPE	Copper	10	5	65
15.637	U.A.B No.2	Excitation System	1	415V	XLPE	Copper	4	4	70
15.638	U.A.B No.2	Excitation System	1	415V	XLPE	Copper	2.5	3	70
15.639	U.A.B No.2	Damper Control Panel	1	415v	XLPE	Copper	4	4	50
15.640	U.A.Tx No. 2	U.A.B No.2	7	415V	XLPE	Copper	400	1	35
15.641	U.A.B No.3	Booster pump A	1	415V	XLPE	Copper	6	4	65
15.642	U.A.B No.3	Booster pump A - Control	1	240v	XLPE	Copper	2.5	5	65
15.643	U.A.B No.3	Booster pump B	1	415V	XLPE	Copper	6	4	65
15.644	U.A.B No.3	Booster pump B - Control	1	240v	XLPE	Copper	2.5	5	65
15.645	U.A.B No.3	Throttle Valve	1	415V	XLPE	Copper	2.5	5	30
15.646	U.A.B No.3	Cooling Ignition Fan	1	415V	XLPE	Copper	6	4	80
15.647	U.A.B No.3	Cooling Ignition Fan - control	1	240v	XLPE	Copper	2.5	5	80
15.648	U.A.B No.3	Condensate Pass out Valve	1	415V	XLPE	Copper	2.5	4	42
15.649	U.A.B No.3	Live Steam Bypass Valve	1	415V	XLPE	Copper	2.5	4	55
15.650	U.A.B No.3	Live Steam Stop Valve	1	415V	XLPE	Copper	2.5	4	55
15.651	U.A.B No.3	Sump Pump	1	415V	XLPE	Copper	2.5	4	60
15.652	U.A.B No.3	Turning Gear Motor	1	415V	XLPE	Copper	2.5	4	43
15.653	U.A.B No.3	Turning Gear Motor - control	1	240v	XLPE	Copper	2.5	5	40
15.654	U.A.B No.3	Turing Gear Oil Pump	1	415V	XLPE	Copper	2.5	4	30
15.655	U.A.B No.3	Turing Gear Oil Pump - control	1	240v	XLPE	Copper	2.5	5	30
15.656	U.A.B No.3	Oil Vapor Fan 3A	1	415V	XLPE	Copper	2.5	4	30
15.657	U.A.B No.3	Oil Vapor Fan 3A - Control	1	240v	XLPE	Copper	2.5	5	30
15.658	U.A.B No.3	Aux. Oil Pump	1	415V	XLPE	Copper	25	3	30

15.659	U.A.B No.3	Aux. Oil Pump - control	1	240v	XLPE	Copper	2.5	5	30
15.660	U.A.B No.3	Gland Condenser Fan A	1	415V	XLPE	Copper	2.5	4	30
15.661	U.A.B No.3	Gland Condenser Fan A - control	1	240v	XLPE	Copper	2.5	5	30
15.662	U.A.B No.3	Gland Condenser Fan B	1	415V	XLPE	Copper	2.5	4	30
15.663	U.A.B No.3	Gland Condenser Fan B - control	1	240v	XLPE	Copper	2.5	5	30
15.664	U.A.B No.3	Condensate Ext. pump A	1	415V	XLPE	Copper	50	3	50
15.665	U.A.B No.3	Condensate Ext. pump A - control	1	240v	XLPE	Copper	2.5	5	50
15.666	U.A.B No.3	Condensate Ext. pump B	1	415V	XLPE	Copper	50	3	45
15.667	U.A.B No.3	Condensate Ext. pump B - Control	1	240v	XLPE	Copper	2.5	5	45
15.668	U.A.B No.3	Cooling Water pump A	1	415V	XLPE	Copper	150	3	48
15.669	U.A.B No.3	Cooling Water pump A - Control	1	240v	XLPE	Copper	2.5	5	48
15.670	U.A.B No.3	Cooling Water pump B	1	415V	XLPE	Copper	150	3	65
15.671	U.A.B No.3	Cooling Water pump B - Control	1	240v	XLPE	Copper	2.5	5	65
15.672	U.A.B No.3	Lube Oil Purifier	1	415V	XLPE	Copper	70	3	33
15.673	U.A.B No.3	Boiler 3 Lighting	1	415V	XLPE	Copper	25	3	30
15.674	U.A.B No.3	G.Tx No.3 Aux. Board	1	415V	XLPE	Copper	10	5	65
15.675	U.A.B No.3	Excitation System	1	415V	XLPE	Copper	4	4	70
15.676	U.A.B No.3	Excitation System	1	415V	XLPE	Copper	2.5	3	70
15.677	U.A.B No.3	Damper Control Panel	1	415v	XLPE	Copper	4	4	50
15.678	U.A.Tx No. 3	U.A.B No.3	7	415V	XLPE	Copper	400	1	35
15.679	U.A.B No.4	Booster pump A	1	415V	XLPE	Copper	6	4	65
15.680	U.A.B No.4	Booster pump A - Control	1	240v	XLPE	Copper	2.5	5	65
15.681	U.A.B No.4	Booster pump B	1	415V	XLPE	Copper	6	4	65
15.682	U.A.B No.4	Booster pump B - Control	1	240v	XLPE	Copper	2.5	5	65
15.683	U.A.B No.4	Throttle Valve	1	415V	XLPE	Copper	2.5	5	30
15.684	U.A.B No.4	Cooling Ignition Fan	1	415V	XLPE	Copper	6	4	80
15.685	U.A.B No.4	Cooling Ignition Fan - control	1	240v	XLPE	Copper	2.5	5	80
15.686	U.A.B No.4	Condensate Passout Valve	1	415V	XLPE	Copper	2.5	4	42
15.687	U.A.B No.4	Live Steam Bypass Valve	1	415V	XLPE	Copper	2.5	4	55
15.688	U.A.B No.4	Live Steam Stop Valve	1	415V	XLPE	Copper	2.5	4	55
15.689	U.A.B No.4	Sump Pump	1	415V	XLPE	Copper	2.5	4	60
15.690	U.A.B No.4	Turning Gear Motor	1	415V	XLPE	Copper	6	4	43

15.691	U.A.B No.4	Turning Gear Motor - control	1	240v	XLPE	Copper	2.5	5	40
15.692	U.A.B No.4	Turing Gear Oil Pump	1	415V	XLPE	Copper	6	4	30
15.693	U.A.B No.4	Turing Gear Oil Pump - control	1	240v	XLPE	Copper	2.5	5	30
15.694	U.A.B No.4	Oil Vapor Fan 4A	1	415V	XLPE	Copper	2.5	4	30
15.695	U.A.B No.4	Oil Vapor Fan 4A - Control	1	240v	XLPE	Copper	2.5	5	30
15.696	U.A.B No.4	Aux. Oil Pump	1	415V	XLPE	Copper	25	3	30
15.697	U.A.B No.4	Aux. Oil Pump - control	1	240v	XLPE	Copper	2.5	5	30
15.698	U.A.B No.4	Gland Condenser Fan A	1	415V	XLPE	Copper	2.5	4	30
15.699	U.A.B No.4	Gland Condenser Fan A - control	1	240v	XLPE	Copper	2.5	5	30
15.700	U.A.B No.4	Gland Condenser Fan B	1	415V	XLPE	Copper	2.5	4	30
15.701	U.A.B No.4	Gland Condenser Fan B - control	1	240v	XLPE	Copper	2.5	5	30
15.702	U.A.B No.4	Condensate Ext. pump A	1	415V	XLPE	Copper	50	3	50
15.703	U.A.B No.4	Condensate Ext. pump A - control	1	240v	XLPE	Copper	2.5	5	50
15.704	U.A.B No.4	Condensate Ext. pump B	1	415V	XLPE	Copper	50	3	45
15.705	U.A.B No.4	Condensate Ext. pump B - Control	1	240v	XLPE	Copper	2.5	5	45
15.706	U.A.B No.4	Cooling Water pump A	1	415V	XLPE	Copper	150	3	48
15.707	U.A.B No.4	Cooling Water pump A - Control	1	240v	XLPE	Copper	2.5	5	48
15.708	U.A.B No.4	Cooling Water pump B	1	415V	XLPE	Copper	150	3	65
15.709	U.A.B No.4	Cooling Water pump B - Control	1	240v	XLPE	Copper	2.5	5	65
15.710	U.A.B No.4	Lube Oil Purifier	1	415V	XLPE	Copper	70	3	33
15.711	U.A.B No.4	Boiler 4 Lighting	1	415V	XLPE	Copper	25	3	30
15.712	U.A.B No.4	G.Tx No.4 Aux. Board	1	415V	XLPE	Copper	10	5	65
15.713	U.A.B No.4	Excitation System	1	415V	XLPE	Copper	4	4	70
15.714	U.A.B No.4	Excitation System	1	415V	XLPE	Copper	2.5	3	70
15.715	U.A.B No.4	Damper Control Panel	1	415v	XLPE	Copper	4	4	50
15.716	U.A.Tx No. 4	U.A.B No.4	7	415V	XLPE	Copper	400	1	35
15.717	S.A.B No.1	Bearing Cooling pump 1	1	415V	XLPE	Copper	2.5	4	25
15.718	S.A.B No.1	Bearing Cooling pump 1 - Control	1	240v	XLPE	Copper	2.5	5	25
15.719	S.A.B No.1	Bearing Cooling pump 2	1	415V	XLPE	Copper	2.5	4	25
15.720	S.A.B No.1	Bearing Cooling pump 2 - control	1	240v	XLPE	Copper	2.5	5	25

15.721	S.A.B No.1	Cleaning Drain Pump 1	1	415V	XLPE	Copper	4	4	30
15.722	S.A.B No.1	Cleaning Drain Pump 1 - control	1	240v	XLPE	Copper	2.5	5	30
15.723	S.A.B No.1	Cleaning Drain Pump 2	1	415V	XLPE	Copper	4	4	30
15.724	S.A.B No.1	Cleaning Drain Pump 2 - control	1	240v	XLPE	Copper	2.5	5	30
15.725	S.A.B No.1	HP Dosing pump 1	1	415V	XLPE	Copper	2.5	4	22
15.726	S.A.B No.1	HP Dosing pump 1 - control	1	240v	XLPE	Copper	2.5	5	22
15.727	S.A.B No.1	HP Dosing pump 2	1	415V	XLPE	Copper	2.5	4	22
15.728	S.A.B No.1	HP Dosing pump 2 - control	1	240v	XLPE	Copper	2.5	5	22
15.729	S.A.B No.1	HP Dosing Mixer	1	415V	XLPE	Copper	2.5	4	20
15.730	S.A.B No.1	HP Dosing Mixer - control	1	240v	XLPE	Copper	2.5	5	20
15.731	S.A.B No.1	Service Sea Water 1	1	415V	XLPE	Copper	10	4	40
15.732	S.A.B No.1	Service Sea Water 1 - control	1	240v	XLPE	Copper	2.5	5	40
15.733	S.A.B No.1	Service Sea Water 2	1	415V	XLPE	Copper	2.5	4	40
15.734	S.A.B No.1	Service Sea Water 2 - control	1	240v	XLPE	Copper	2.5	5	40
15.735	S.A.B No.1	Oil Vapor Fan 1B	1	415V	XLPE	Copper	2.5	4	35
15.736	S.A.B No.1	Oil Vapor Fan 1B - control	1	240v	XLPE	Copper	2.5	5	35
15.737	S.A.B No.1	Oil Vapor Fan 2B	1	415V	XLPE	Copper	2.5	4	35
15.738	S.A.B No.1	Oil Vapor Fan 2B - control	1	240v	XLPE	Copper	2.5	5	35
15.739	S.A.B No.1	240V Battery Charger No.1	1	415V	XLPE	Copper	90	3	50
15.740	S.A.B No.1	LP Dosing Station	1	415V	XLPE	Copper	10	5	40
15.741	S.A.B No.1	Supply to Boiler 1 Lighting	1	415V	XLPE	Copper	25	3	30
15.742	S.A.B No.1	Supply to Boiler 2 Lighting	1	415V	XLPE	Copper	25	3	30
15.743	S.A.B No.1	Supply To Relay Room DB7	1	415V	XLPE	Copper	10	5	45
15.744	S.A.B No.1	Supply to LVAC DB12	1	415V	XLPE	Copper	25	3	28
15.745	S.A.B No.1	Supply For 66kv House DB11A	1	415V	XLPE	Copper	95	3	160
15.746	S.A.B No.1	Passenger Lift	1	415V	XLPE	Copper	24	4	55
15.747	S.A.B No.1	Instrument Air Dryer 1	1	415V	XLPE	Copper	10	4	32
15.748	S.A.B No.1	Emergency Diesel generator	1	415V	XLPE	Copper	25	3	55
15.749	S.A.B No.1	Turbine Hall Crane	1	415V	XLPE	Copper	95	3	50
15.750	S.A.B No.1	Supply For SCADA Room	1	415V	XLPE	Copper	10	5	85
15.751	S.A.B No.1	Instrument Air Compressor 1	1	415V	XLPE	Copper	95	3	35
15.752	S.A.B No.1	Instrument Air Compressor 1 - control	1	240v	XLPE	Copper	2.5	5	35
15.753	S.A.B No.1	Supply For Demin Plant	4	415V	XLPE	Copper	400	1	50
15.754	S.A.B No.1	Goods Lift	1	415V	XLPE	Copper	50	4	65

15.755	S.A.B No.1	Service Air Compressor 2	1	415V	XLPE	Copper	95	3	35
15.756	S.A.B No.1	Service Air Compressor 2 - control	1	240v	XLPE	Copper	2.5	5	35
15.757	S.A.B No.1	UPS 1	1	415V	XLPE	Copper	35	4	50
15.758	S.A.B No.1	UPS 1 Bypass	1	415V	XLPE	Copper	35	4	50
15.759	S.A.B No.1	24V Battery Charger 1	1	415V	XLPE	Copper	25	3	50
15.760	S.A.B No.1	Turbine Hall Lighting (GAB1)	1	415V	XLPE	Copper	120	3	40
15.761	S.A.Tx No.1	S.A.B No.1	11	415V	XLPE	Copper	400	1	45
15.762	Emergency Diesel generator	S.A.B No.1	11	415V	XLPE	Copper	400	1	55
15.763	S.A.B No.1	Fire System Panel	1	415V	XLPE	Copper	95	3	85
15.764	S.A.B No.2	Bearings cooler pump 3	1	415V	XLPE	Copper	2.5	4	25
15.765	S.A.B No.2	Bearings cooler pump 3 - control	1	240v	XLPE	Copper	2.5	5	25
15.766	S.A.B No.2	Bearings cooler pump 4	1	415V	XLPE	Copper	2.5	4	23
15.767	S.A.B No.2	Bearings cooler pump 4 - control	1	240v	XLPE	Copper	2.5	5	23
15.768	S.A.B No.2	HP Dosing Pump 3	1	415V	XLPE	Copper	2.5	4	25
15.769	S.A.B No.2	HP Dosing Pump 3 - control	1	240v	XLPE	Copper	2.5	5	25
15.770	S.A.B No.2	HP Dosing Pump 4	1	415V	XLPE	Copper	2.5	4	23
15.771	S.A.B No.2	HP Dosing Pump 4 - control	1	240v	XLPE	Copper	2.5	5	23
15.772	S.A.B No.2	HP Dosing Mixer	1	415V	XLPE	Copper	2.5	4	22
15.773	S.A.B No.2	HP Dosing Mixer - control	1	240v	XLPE	Copper	2.5	5	22
15.774	S.A.B No.2	Service Sea Water 3	1	415V	XLPE	Copper	10	4	45
15.775	S.A.B No.2	Service Sea Water 3 - control	1	240v	XLPE	Copper	2.5	5	45
15.776	S.A.B No.2	Service Sea Water 4	1	415V	XLPE	Copper	10	4	45
15.777	S.A.B No.2	Service Sea Water 4 - control	1	240v	XLPE	Copper	2.5	5	45
15.778	S.A.B No.2	Oil Vapor Fan 3B	1	415V	XLPE	Copper	2.5	4	35
15.779	S.A.B No.2	Oil Vapor Fan 3B - control	1	240v	XLPE	Copper	2.5	5	35
15.780	S.A.B No.2	Oil Vapor Fan 4B	1	415V	XLPE	Copper	2.5	4	35
15.781	S.A.B No.2	Oil Vapour Fan 4B - control	1	240v	XLPE	Copper	2.5	5	35
15.782	S.A.B No.2	Raw FWB 2	1	415V	XLPE	Copper	25	3	55
15.783	S.A.B No.2	Raw FWB 2	1	240v	XLPE	Copper	2.5	5	55
15.784	S.A.B No.2	240V Battery Charger No.2	1	415V	XLPE	Copper	95	3	75
15.785	S.A.B No.2	Instrument Air Compressor 2	1	415V	XLPE	Copper	95	3	52
15.786	S.A.B No.2	Instrument Air Compressor 2 - control	1	240V	XLPE	Copper	2.5	5	52

15.787	S.A.B No.2	Supply for Boiler 3 lighting	1	415V	XLPE	Copper	25	3	30
15.788	S.A.B No.2	Supply for Boiler 4 lighting	1	415V	XLPE	Copper	25	3	30
15.789	S.A.B No.2	Supply for LVAC Relay Room DB7	1	415V	XLPE	Copper	10	5	75
15.790	S.A.B No.2	Supply For LVAC DB13	1	415V	XLPE	Copper	25	3	22
15.791	S.A.B No.2	Supply For LVAC DB14	1	415V	XLPE	Copper	35	3	45
15.792	S.A.B No.2	Supply For LVAC DB11A 66KV house	1	415V	XLPE	Copper	95	3	190
15.793	S.A.B No.2	Instrument Air Dryer 2	1	415V	XLPE	Copper	10	4	25
15.794	S.A.B No.2	DCR AC No.1	1	415V	XLPE	Copper	95	3	70
15.795	S.A.B No.2	DCR AC No.2	1	415V	XLPE	Copper	95	3	75
15.796	S.A.B No.2	LP Dosing Station	1	415V	XLPE	Copper	10	5	55
15.797	S.A.B No.2	Passenger Lift	1	415V	XLPE	Copper	25	4	65
15.798	S.A.B No.2	UPS 2	1	415V	XLPE	Copper	35	4	75
15.799	S.A.B No.2	UPS 2 Bypass	1	415V	XLPE	Copper	35	4	75
15.800	S.A.B No.2	24V Battery Charger 1	1	415V	XLPE	Copper	25	3	75
15.801	S.A.B No.2	Goods Lift	1	415V	XLPE	Copper	50	4	67
15.802	S.A.Tx No.2	S.A.B No.2	11	415V	XLPE	Copper	400	1	50
15.803	S.A.B No.1	S.A.B No.2	7	415V	XLPE	Copper	400	1	55
15.804	G.A.B No.2	S.A.B No.2	7	415V	XLPE	Copper	400	1	80
15.805	Dist. 1A 415V Board	Service Crane	1	415V	XLPE	Copper	4	4	59
15.806	Dist. 1A 415V Board	Service Crane - control	1	240v	XLPE	Copper	2.5	4	59
15.807	Dist. 1A 415V Board	Crane	1	415V	XLPE	Copper	16	4	63
15.808	Dist. 1A 415V Board	Crane - control	1	240v	XLPE	Copper	2.5	4	63
15.809	Dist. 1A 415V Board	D.A.B Lighting	1	415V	XLPE	Copper	70	4	15
15.810	Dist. 1A 415V Board	D.A.B Lighting - control	1	240v	XLPE	Copper	2.5	4	15
15.811	Dist. 1A 415V Board	Main outlet Lp Steam	1	415V	XLPE	Copper	70	4	64
15.812	Dist. 1A 415V Board	Main outlet Lp Steam - control	1	240v	XLPE	Copper	2.5	4	64
15.813	Dist. 1A 415V Board	Sump Pump	1	415V	XLPE	Copper	10	4	15
15.814	Dist. 1A 415V Board	Sump Pump - control	1	240v	XLPE	Copper	2.5	4	15
15.815	Dist. 1A 415V Board	Power Supply to Anti Foam	1	415V	XLPE	Copper	10	4	18
15.816	Dist. 1A 415V Board	Power Supply to Anti Foam - control	1	240v	XLPE	Copper	2.5	4	18
15.817	Dist. 1A 415V Board	LP Section 2/3 Valve	1	415V	XLPE	Copper	6	4	21
15.818	Dist. 1A 415V Board	LP Section 2/3 Valve - control	1	240v	XLPE	Copper	2.5	4	21
15.819	Dist. 1A 415V Board	LP Section 3/4 Valve	1	415V	XLPE	Copper	1.5	4	16

15.820	Dist. 1A 415V Board	LP Section 3/4 Valve - control	1	240v	XLPE	Copper	2.5	4	16
15.821	Dist. 1A 415V Board	Air Compressor A	1	415V	XLPE	Copper	70	4	42
15.822	Dist. 1A 415V Board	Air Compressor A - Control	1	240v	XLPE	Copper	2.5	4	42
15.823	Dist. 1A 415V Board	Blow Down A	1	415V	XLPE	Copper	70	4	40
15.824	Dist. 1A 415V Board	Blow Down A - Control	1	240v	XLPE	Copper	2.5	4	40
15.825	Dist. 1A 415V Board	LP Pass out Header 3	1	415V	XLPE	Copper	1.5	4	80
15.826	Dist. 1A 415V Board	LP Pass out Header 3 - control	1	240v	XLPE	Copper	2.5	4	80
15.827	Dist. 1A 415V Board	LP Pass out Header 4	1	415V	XLPE	Copper	1.5	4	81
15.828	Dist. 1A 415V Board	LP Pass out Header 4 - control	1	240v	XLPE	Copper	2.5	4	81
15.829	Dist. 1A 415V Board	Aux. Oil Pump	1	415V	XLPE	Copper	1.5	4	93
15.830	Dist. 1A 415V Board	Aux. Oil Pump - control	1	240v	XLPE	Copper	2.5	4	93
15.831	Dist. 1A 415V Board	Sea Water Speed Changer	1	415V	XLPE	Copper	1.5	4	96
15.832	Dist. 1A 415V Board	Sea Water Speed Changer - control	1	240v	XLPE	Copper	2.5	4	96
15.833	Dist. 1A 415V Board	Sea Water pump A	1	415V	XLPE	Copper	1.5	4	98
15.834	Dist. 1A 415V Board	Sea Water pump A - control	1	240v	XLPE	Copper	2.5	4	98
15.835	Dist. 1A 415V Board	Main LP Steam	1	415V	XLPE	Copper	1.5	4	96
15.836	Dist. 1A 415V Board	Main LP Steam - control	1	240v	XLPE	Copper	2.5	4	96
15.837	Dist. 1A 415V Board	Brine Ext. Gear Box A	1	415V	XLPE	Copper	1.5	4	93
15.838	Dist. 1A 415V Board	Brine Ext. Gear Box A - control	1	240v	XLPE	Copper	2.5	4	93
15.839	Dist. 1A 415V Board	Brine Ext. Aux Oil	1	415V	XLPE	Copper	1.5	4	97
15.840	Dist. 1A 415V Board	Brine Ext. Aux Oil - control	1	240v	XLPE	Copper	2.5	4	97
15.841	Dist. 1A 415V Board	Brine Ext. Speed Changer	1	415V	XLPE	Copper	1.5	4	99
15.842	Dist. 1A 415V Board	Brine Ext. Speed Changer - control	1	240v	XLPE	Copper	2.5	4	99
15.843	Dist. 1A 415V Board	Brine Ext. Dist Changer	1	415V	XLPE	Copper	1.5	4	98
15.844	Dist. 1A 415V Board	Brine Ext. Dist Changer - control	1	240v	XLPE	Copper	2.5	4	98
15.845	Dist. 1A 415V Board	Brine Ext. Gear Box 1	1	415V	XLPE	Copper	1.5	4	97
15.846	Dist. 1A 415V Board	Brine Ext. Gear Box 1 - control	1	240v	XLPE	Copper	2.5	4	97
15.847	Dist. 1A 415V Board	Brine Ext Gear Box 2	1	415V	XLPE	Copper	1.5	4	68
15.848	Dist. 1A 415V Board	Brine Ext Gear Box 2 - control	1	240v	XLPE	Copper	2.5	4	68
15.849	Dist. 1A 415V Board	De Supper Heater A	1	415V	XLPE	Copper	2.5	4	70
15.850	Dist. 1A 415V Board	De Supper Heater A - control	1	240v	XLPE	Copper	2.5	4	70
15.851	Dist. 1A 415V Board	De Supper Heater B	1	415V	XLPE	Copper	2.5	4	63
15.852	Dist. 1A 415V Board	De Supper Heater B - Control	1	240v	XLPE	Copper	2.5	4	63

15.853	Dist. 1A 415V Board	Vent Condenser A	1	415V	XLPE	Copper	16	4	66
15.854	Dist. 1A 415V Board	Vent Condenser A - control	1	240v	XLPE	Copper	2.5	4	66
15.855	Dist. 1A 415V Board	Vent Condenser B	1	415V	XLPE	Copper	25	4	48
15.856	Dist. 1A 415V Board	Vent Condenser B - control	1	240v	XLPE	Copper	2.5	4	48
15.857	Dist. 1A 415V Board	Distillate Product	1	415V	XLPE	Copper	70	4	35
15.858	Dist. 1A 415V Board	Distillate Product - control	1	240v	XLPE	Copper	2.5	4	35
15.859	Dist. 1B 415V Board	Service Crane	1	415V	XLPE	Copper	4	4	59
15.860	Dist. 1B 415V Board	Service Crane - control	1	240v	XLPE	Copper	2.5	4	59
15.861	Dist. 1B 415V Board	Service Crane	1	415V	XLPE	Copper	16	4	63
15.862	Dist. 1B 415V Board	Service Crane - control	1	240v	XLPE	Copper	2.5	4	63
15.863	Dist. 1B 415V Board	D.A.B Lighting	1	415V	XLPE	Copper	70	4	15
15.864	Dist. 1B 415V Board	D.A.B Lighting - control	1	240v	XLPE	Copper	2.5	4	15
15.865	Dist. 1B 415V Board	Main outlet Lp Steam	1	415V	XLPE	Copper	70	4	64
15.866	Dist. 1B 415V Board	Main outlet Lp Steam - control	1	240v	XLPE	Copper	2.5	4	64
15.867	Dist. 1B 415V Board	Sump Pump	1	415V	XLPE	Copper	10	4	15
15.868	Dist. 1B 415V Board	Sump Pump - control	1	240v	XLPE	Copper	2.5	4	15
15.869	Dist. 1B 415V Board	Power Supply to Anti Foam	1	415V	XLPE	Copper	10	4	18
15.870	Dist. 1B 415V Board	Power Supply to Anti Foam - control	1	240v	XLPE	Copper	2.5	4	18
15.871	Dist. 1B 415V Board	LP Section 2/3 Valve	1	415V	XLPE	Copper	6	4	21
15.872	Dist. 1B 415V Board	LP Section 2/3 Valve - control	1	240v	XLPE	Copper	2.5	4	21
15.873	Dist. 1B 415V Board	LP Section 3/4 Valve	1	415V	XLPE	Copper	15	4	16
15.874	Dist. 1B 415V Board	LP Section 3/4 Valve - control	1	240v	XLPE	Copper	2.5	4	16
15.875	Dist. 1B 415V Board	Air Compressor B	1	415V	XLPE	Copper	70	4	42
15.876	Dist. 1B 415V Board	Air Compressor B - control	1	240v	XLPE	Copper	2.5	4	42
15.877	Dist. 1B 415V Board	Blow Down B	1	415V	XLPE	Copper	70	4	40
15.878	Dist. 1B 415V Board	Blow Down B - control	1	240v	XLPE	Copper	2.5	4	40
15.879	Dist. 1B 415V Board	LP Pass out Header 3	1	415V	XLPE	Copper	1.5	4	80
15.880	Dist. 1B 415V Board	LP Pass out Header 3 - control		240v	XLPE	Copper	2.5	4	80
15.881	Dist. 1B 415V Board	LP Pass out Header 4	1	415V	XLPE	Copper	1.5	4	82
15.882	Dist. 1B 415V Board	LP Pass out Header 4 - control		240v	XLPE	Copper	2.5	4	82
15.883	D.A.T No.1	Dist. 1A 415V Board	7	415V	XLPE	Copper	240	1	15
15.884	D.A.T No.2	Dist. 1B 415V Board	7	415V	XLPE	Copper	240	1	16
15.885	Dist. 1B 415V Board	Aux. Oil Pump	1	415V	XLPE	Copper	1.5	4	93
15.886	Dist. 1B 415V Board	Aux. Oil Pump - control	1	240v	XLPE	Copper	2.5	4	93

15.887	Dist. 1B 415V Board	S.W Speed Changer	1	415V	XLPE	Copper	1.5	4	96
15.888	Dist. 1B 415V Board	S.W Speed Changer - control	1	240v	XLPE	Copper	2.5	4	96
15.889	Dist. 1B 415V Board	S.w pump B	1	415V	XLPE	Copper	1.5	4	98
15.890	Dist. 1B 415V Board	S.w pump B - Control	1	240v	XLPE	Copper	2.5	4	98
15.891	Dist. 1B 415V Board	Main LP Steam	1	415V	XLPE	Copper	1.5	4	96
15.892	Dist. 1B 415V Board	Main LP Steam - control	1	240v	XLPE	Copper	2.5	4	96
15.893	Dist. 1B 415V Board	Brine Ext. Gear Box B	1	415V	XLPE	Copper	1.5	4	93
15.894	Dist. 1B 415V Board	Brine Ext. Gear Box B - control	1	240v	XLPE	Copper	2.5	4	93
15.895	Dist. 1B 415V Board	Brine Ext. Aux Oil	1	415V	XLPE	Copper	4	4	97
15.896	Dist. 1B 415V Board	Brine Ext. Aux Oil - control	1	240v	XLPE	Copper	2.5	4	97
15.897	Dist. 1B 415V Board	Brine Ext. Speed Changer	1	415V	XLPE	Copper	1.5	4	99
15.898	Dist. 1B 415V Board	Brine Ext. Speed Changer - control	1	240v	XLPE	Copper	2.5	4	99
15.899	Dist. 1B 415V Board	Brine Ext Dist Changer	1	415V	XLPE	Copper	1.5	4	98
15.900	Dist. 1B 415V Board	Brine Ext Dist Changer - control	1	240v	XLPE	Copper	2.5	4	98
15.901	Dist. 1B 415V Board	Brine Ext. Gearbox 2	1	415V	XLPE	Copper	1.5	4	97
15.902	Dist. 1B 415V Board	Brine Ext. Gearbox 2 - control	1	240v	XLPE	Copper	2.5	4	97
15.903	Dist. 1B 415V Board	Desupper Heater B	1	415V	XLPE	Copper	2.5	4	68
15.904	Dist. 1B 415V Board	Desupper Heater B - control	1	240v	XLPE	Copper	2.5	4	68
15.905	Dist. 1B 415V Board	Desupper Heater A	1	415V	XLPE	Copper	2.5	4	70
15.906	Dist. 1B 415V Board	Desupper Heater A - control	1	240v	XLPE	Copper	2.5	4	70
15.907	Dist. 1B 415V Board	Vent Condenser A	1	415V	XLPE	Copper	16	4	63
15.908	Dist. 1B 415V Board	Vent Condenser A - control	1	240v	XLPE	Copper	2.5	4	63
15.909	Dist. 1B 415V Board	Vent Condenser B	1	415V	XLPE	Copper	16	4	66
15.910	Dist. 1B 415V Board	Vent Condenser B - control	1	240v	XLPE	Copper	2.5	4	66
15.911	Dist. 1B 415V Board	Condensate pump A	1	415V	XLPE	Copper	25	4	48
15.912	Dist. 1B 415V Board	Condensate pump A - control	1	240v	XLPE	Copper	2.5	4	48
15.913	Dist. 1B 415V Board	Distillate pump	1	415V	XLPE	Copper	70	4	35
15.914	Dist. 1B 415V Board	Distillate pump - control	1	240v	XLPE	Copper	2.5	4	35
15.915	1DD1 415V Board	GT5 Turbine hall D.B	1	415V	XLPE	Copper	50	3	35
15.916	1DD1 415V Board	GT5 Turbine hall D.B - control	1	240v	XLPE	Copper	2.5	14	35
15.917	1DD1 415V Board	Hand Lamp Socket	1	415V	XLPE	Copper	10	3	120
15.918	1DD1 415V Board	Hand Lamp Socket - control	1	240v	XLPE	Copper	2.5	14	120
15.919	1DD1 415V Board	Light-Panel 1	1	415V	XLPE	Copper	50	4	30
15.920	1DD1 415V Board	Light-Panel 1 - control	1	240v	XLPE	Copper	2.5	14	30

15.921	1DD1 415V Board	Fan Compressor Room	1	415V	XLPE	Copper	2.5	3	77
15.922	1DD1 415V Board	Fan Compressor Room - control	1	240v	XLPE	Copper	2.5	14	77
15.923	1DD1 415V Board	Power Tool Socket 2	1	415V	XLPE	Copper	50	5	40
15.924	1DD1 415V Board	Power Tool Socket 2 - control	1	240v	XLPE	Copper	2.5	14	40
15.925	1DD1 415V Board	Power Socket panel No.2	1	415V	XLPE	Copper	50	4	40
15.926	1DD1 415V Board	Power Socket panel No.2 - control	1	240v	XLPE	Copper	2.5	14	40
15.927	1DD1 415V Board	Hand Lamp Socket	1	415V	XLPE	Copper	10	4	120
15.928	1DD1 415V Board	Hand Lamp Socket - control	1	240v	XLPE	Copper	2.5	14	120
15.929	1DD1 415V Board	AC Turbine Control Room	1	415V	XLPE	Copper	50	5	76
15.930	1DD1 415V Board	AC Turbine Control Room - control	1	240v	XLPE	Copper	2.5	14	76
15.931	1DD1 415V Board	Draining Pump	3	415V	XLPE	Copper	10	5	60
15.932	1DD1 415V Board	Draining Pump - pump	1	240v	XLPE	Copper	2.5	14	60
15.933	1DD1 415V Board	ACU 2-A Control Room	3	415V	XLPE	Copper	25	3	30
15.934	1DD1 415V Board	ACU 2-A Control Room - control	1	240v	XLPE	Copper	2.5	14	30
15.935	1DD1 415V Board	ACU 2-B Control Room	1	415V	XLPE	Copper	25	3	30
15.936	1DD1 415V Board	ACU 2-B Control Room - control	1	240v	XLPE	Copper	2.5	14	30
15.937	1DD1 415V Board	Control Panel 1AT1	1	415V	XLPE	Copper	10	4	50
15.938	1DD1 415V Board	Control Panel 1AT1 - control	1	240v	XLPE	Copper	2.5	14	50
15.939	1DD1 415V Board	GT5 Control Room Socket	1	415V	XLPE	Copper	4	4	75
15.940	1DD1 415V Board	GT5 Control Room Socket - control	1	240v	XLPE	Copper	2.5	14	75
15.941	1DD1 415V Board	Travel Bridge	2	415V	XLPE	Copper	50	3	67
15.942	1DD1 415V Board	Travel Bridge - control	1	240v	XLPE	Copper	2.5	14	67
15.943	1DD1 415V Board	Light Panel Lp-02	1	415V	XLPE	Copper	10	5	15
15.944	1DD1 415V Board	Light Panel Lp-02 - control	1	240v	XLPE	Copper	2.5	14	15
15.945	1DD1 415V Board	O2 System	1	415V	XLPE	Copper	10	4	72
15.946	1DD1 415V Board	O2 System - control	1	240v	XLPE	Copper	1.5	20	72
15.947	1DD2 415V Board	Light Panel No.2	1	415V	XLPE	Copper	50	5	20
15.948	1DD2 415V Board	Light Panel No.2 - control	1	240v	XLPE	Copper	1.5	20	20
15.949	1DD2 415V Board	Fan For Control Room No.2	1	415V	XLPE	Copper	25	3	81
15.950	1DD2 415V Board	Fan For Control Room No.2 - control	1	240	XLPE	Copper	1.5	20	81
15.951	1DD2 415V Board	Power Tool Socket 1	1	415V	XLPE	Copper	50	5	120
15.952	1DD2 415V Board	Power Tool Socket 1 - control	1	240v	XLPE	Copper	1.5	20	120

15.953	1DD2 415V Board	H2 Light Panel 1	1	415V	XLPE	Copper	50	3	55
15.954	1DD2 415V Board	H2 Light Panel 1 - control	1	240v	XLPE	Copper	1.5	20	55
15.955	1DD2 415V Board	1AT1 Local Panel	1	415V	XLPE	Copper	16	4	133
15.956	1DD2 415V Board	1AT1 Local Panel - control	1	240v	XLPE	Copper	1.5	20	133
15.957	1DD2 415V Board	AC Turbine Control Room	1	415V	XLPE	Copper	25	3	25
15.958	1DD2 415V Board	AC Turbine Control Room - control	1	240v	XLPE	Copper	1.5	20	25
15.959	1DD2 415V Board	GT5 New DB	1	415V	XLPE	Copper	95	4	80
15.960	1DD2 415V Board	GT5 New DB - control	1	240v	XLPE	Copper	1.5	20	80
15.961	1DD2 415V Board	Switchgear Room	1	415V	XLPE	Copper	1.5	4	37
15.962	1DD2 415V Board	Switchgear Room - control	1	240v	XLPE	Copper	1.5	20	37
15.963	1DD2 415V Board	Ventilation System 2	2	415V	XLPE	Copper	10	4	55
15.964	1DD2 415V Board	Ventilation System 2 - control	1	240v	XLPE	Copper	1.5	20	55
15.965	1DD2 415V Board	AC 1A	1	415V	XLPE	Copper	50	3	74
15.966	1DD2 415V Board	AC 1A - control	1	240v	XLPE	Copper	1.5	20	74
15.967	1DD2 415V Board	Chemical Hoist	1	415V	XLPE	Copper	16	4	90
15.968	1DD2 415V Board	Chemical Hoist - control	1	240v	XLPE	Copper	1.5	20	90
15.969	1DD2 415V Board	Draining Pump	3	415V	XLPE	Copper	10	5	50
15.970	1DD2 415V Board	Draining Pump - control	1	240v	XLPE	Copper	1.5	20	50
15.971	1DD2 415V Board	Street Lighting	1	415V	XLPE	Copper	25	4	67
15.972	1DD2 415V Board	Street Lighting - control	1	240v	XLPE	Copper	2.5	2	67
15.973	1DD2 415V Board	Switchgear Room AC	1	415V	XLPE	Copper	25	3	130
15.974	1DD2 415V Board	Switchgear Room AC - control	1	240v	XLPE	Copper	2.5	2	130
15.975	1DD2 415V Board	Ventilation System 3	2	415V	XLPE	Copper	10	4	47
15.976	1DD2 415V Board	Ventilation System 3 - control	1	240v	XLPE	Copper	2.5	2	47
15.977	1DD2 415V Board	New MMD Workshop	1	415V	XLPE	Copper	120	4	117
15.978	1DD2 415V Board	New MMD Workshop - control	1	240v	XLPE	Copper	2.5	2	117
15.979	1DD2 415V Board	AC 8 Socket Boiler room	1	415V	XLPE	Copper	10	4	45
15.980	1DD2 415V Board	AC 8 Socket Boiler room - control	1	240v	XLPE	Copper	2.5	2	45
15.981	1DD2 415V Board	Electric Duct Heater	1	415V	XLPE	Copper	2.5	4	15
15.982	1DD2 415V Board	Electric Duct Heater - control	1	240v	XLPE	Copper	2.5	2	15
15.983	C.C.R	Fans For Ahu 2	1	415V	XLPE	Copper	2.5	4	15
15.984	C.C.R	Fans For Ahu 2 - control	1	240v	XLPE	Copper	2.5	2	15
15.985	C.C.R	Power Socket Panel No.3	1	415V	XLPE	Copper	95	5	37

15.986	C.C.R	Power Socket Panel No.3 - control	1	240v	XLPE	Copper	2.5	2	37
15.987	C.C.R	Street Lighting 2	2	415V	XLPE	Copper	4	4	65
15.988	C.C.R	Street Lighting 2 - control	1	240v	XLPE	Copper	2.5	2	65
15.989	C.C.R	AC Unit 2	2	415V	XLPE	Copper	10	4	20
15.990	C.C.R	AC Unit 2 - control	1	240V	XLPE	Copper	2.5	2	20
15.991	C.C.R	Supply No.1 To BBQ	1	415V	XLPE	Copper	25	4	77
15.992	C.C.R	Supply No.1 To BBQ - control	1	240v	XLPE	Copper	2.5	2	77
15.993	C.C.R	MMS Store	1	415V	XLPE	Copper	95	4	130
15.994	C.C.R	MMS Store	1	240v	XLPE	Copper	2.5	2	130
15.995	C.C.R	Mess Room toilet	1	415V	XLPE	Copper	25	4	40
15.996	C.C.R	Mess Room toilet - control	1	240v	XLPE	Copper	2.5	2	40
15.997	C.C.R	AC Unit 11KV Room	1	415V	XLPE	Copper	4	4	103
15.998	C.C.R	AC Unit 11KV Room - control	1	240v	XLPE	Copper	2.5	2	103
15.999	1DB2 415V Board	Feed Dosing Tank 2 A	1	415V	XLPE	Copper	2.5	4	45
15.1000	1DB2 415V Board	Feed Dosing Tank 2 A - control	1	240v	XLPE	Copper	2.5	27	45
15.1001	1DB2 415V Board	Atomizing Steam Valve	1	415V	XLPE	Copper	2.5	4	137
15.1002	1DB2 415V Board	Atomizing Steam Valve - control	1	240v	XLPE	Copper	2.5	31	137
15.1003	1DB2 415V Board	Fuel Oil Burning Valve	1	415V	XLPE	Copper	2.5	4	78
15.1004	1DB2 415V Board	Fuel Oil Burning Valve - control	1	240v	XLPE	Copper	2.5	31	78
15.1005	1DB2 415V Board	Atomizing Steam Valve	1	415V	XLPE	Copper	2.5	4	137
15.1006	1DB2 415V Board	Atomizing Steam Valve - control	1	240	XLPE	Copper	2.5	31	137
15.1007	1DB2 415V Board	Feed Dosing Tank	1	415V	XLPE	Copper	2.5	4	99
15.1008	1DB2 415V Board	Feed Dosing Tank - control	1	240v	XLPE	Copper	2.5	11	99
15.1009	1DB2 415V Board	Header Discharging Valve	1	415V	XLPE	Copper	2.5	4	107
15.1010	1DB2 415V Board	Header Discharging Valve - control	1	240v	XLPE	Copper	2.5	22	107
15.1011	1DB2 415V Board	Boiler Discharging Valve A	1	415V	XLPE	Copper	2.5	4	70
15.1012	1DB2 415V Board	Boiler Discharging Valve A - control	1	240v	XLPE	Copper	2.5	10	70
15.1013	1DB2 415V Board	Boiler Discharging Valve B	1	415V	XLPE	Copper	2.5	4	70
15.1014	1DB2 415V Board	Boiler Discharging Valve B - control	1	240v	XLPE	Copper	2.5	11	70
15.1015	1DB2 415V Board	Aux. Boiler Feed water Valve	1	415V	XLPE	Copper	2.5	4	130
15.1016	1DB2 415V Board	Aux. Boiler Feed water Valve - control	1	240v	XLPE	Copper	2.5	10	130

15.1017	1DB2 415V Board	HRB Section Valve A	1	415V	XLPE	Copper	2.5	4	140
15.1018	1DB2 415V Board	HRB Section Valve A - control	1	240v	XLPE	Copper	2.5	22	140
15.1019	1DB2 415V Board	HRB Section Valve B	1	415V	XLPE	Copper	2.5	4	130
15.1020	1DB2 415V Board	HRB Section Valve B - control	1	240v	XLPE	Copper	2.5	22	130
15.1021	1DB2 415V Board	Feed Dosing Tank Pump A	1	415V	XLPE	Copper	2.5	4	133
15.1022	1DB2 415V Board	Feed Dosing Tank Pump A - control	1	240v	XLPE	Copper	2.5	24	133
15.1023	1DB2 415V Board	Boiler Steam Outlet Valve	1	415V	XLPE	Copper	2.5	4	133
15.1024	1DB2 415V Board	Boiler Steam Outlet Valve - control	1	240v	XLPE	Copper	2.5	35	133
15.1025	1DB2 415V Board	Aux. Boiler Feed water Valve	1	415V	XLPE	Copper	2.5	4	105
15.1026	1DB2 415V Board	Aux. Boiler Feed water Valve - control	1	240v	XLPE	Copper	2.5	35	105
15.1027	1DB2 415V Board	Aux. Boiler Feed water Valve	1	415V	XLPE	Copper	2.5	4	180
15.1028	1DB2 415V Board	Aux. Boiler Feed water Valve - control	1	240v	XLPE	Copper	2.5	31	180
15.1029	1DB2 415V Board	Fuel Oil Valve	1	415V	XLPE	Copper	2.5	4	137
15.1030	1DB2 415V Board	Fuel Oil Valve - control	1	240v	XLPE	Copper	2.5	15	137
15.1031	1DB2 415V Board	Fuel Oil Valve	1	415V	XLPE	Copper	2.5	4	145
15.1032	1DB2 415V Board	Fuel Oil Valve - control	1	240v	XLPE	Copper	2.5	15	145
15.1033	1DB2 415V Board	Tank 2 Pump A	1	415V	XLPE	Copper	2.5	4	135
15.1034	1DB2 415V Board	Tank 2 Pump A - control	1	240v	XLPE	Copper	2.5	17	135
15.1035	1DB2 415V Board	Feed Tank Outlet Valve	1	415V	XLPE	Copper	2.5	4	139
15.1036	1DB2 415V Board	Feed Tank Outlet Valve - control	1	240v	XLPE	Copper	2.5	13	139
15.1037	1DB2 415V Board	Section Feed Water A	1	415V	XLPE	Copper	2.5	4	180
15.1038	1DB2 415V Board	Section Feed Water A - control	1	240v	XLPE	Copper	2.5	15	180
15.1039	1DB2 415V Board	Section Feed Water B	1	415V	XLPE	Copper	2.5	4	172
15.1040	1DB2 415V Board	Section Feed Water B - control	1	240v	XLPE	Copper	2.5	15	172
15.1041	1DB2 415V Board	HRB Delivery Valve	1	415V	XLPE	Copper	2.5	4	143
15.1042	1DB2 415V Board	HRB Delivery Valve - control	1	240v	XLPE	Copper	2.5	17	143
15.1043	1DB2 415V Board	Mixer For NoHA	1	415V	XLPE	Copper	2.5	4	149
15.1044	1DB2 415V Board	Mixer For NoHA - control	1	240v	XLPE	Copper	2.5	19	149
15.1045	1DB1 415V Board	Demin Plant A.C	1	415V	XLPE	Copper	6	5	50
15.1046	1DB1 415V Board	Demin Plant A.C - control	1	240v	XLPE	Copper	1.5	2	50
15.1047	1DB1 415V Board	Power Socket Panel 4	1	415V	XLPE	Copper	95	1	55

15.1048	1DB1 415V Board	Power Socket Panel 4 - control	1	240v	XLPE	Copper	1.5	2	55
15.1049	1DB1 415V Board	HRB Start UP	1	415V	XLPE	Copper	2.5	4	65
15.1050	1DB1 415V Board	HRB Start UP - control	1	240v	XLPE	Copper	1.5	23	65
15.1051	1DB1 415V Board	Demin Booster pump	1	415V	XLPE	Copper	4	4	30
15.1052	1DB1 415V Board	Demin Booster pump - control	1	240v	XLPE	Copper	1.5	4	30
15.1053	1DB1 415V Board	Mix-Bed Regeneration	1	415V	XLPE	Copper	4	4	55
15.1054	1DB1 415V Board	Mix-Bed Regeneration - control	1	240v	XLPE	Copper	1.5	15	55
15.1055	1DB1 415V Board	Power Socket Tool	1	415V	XLPE	Copper	35	4	20
15.1056	1DB1 415V Board	Power Socket Tool - control	1	240v	XLPE	Copper	1.5	3	20
15.1057	1DB1 415V Board	Lighting Panel	1	415V	XLPE	Copper	50	50	70
15.1058	1DB1 415V Board	Lighting Panel - control	1	240v	XLPE	Copper	1.5	4	70
15.1059	1DB1 415V Board	Hand Lamp Socket	1	415V	XLPE	Copper	10	4	66
15.1060	1DB1 415V Board	Hand Lamp Socket - control	1	240v	XLPE	Copper	1.5	4	66
15.1061	1DB1 415V Board	Demin Local Board	1	415V	XLPE	Copper	2.5	4	45
15.1062	1DB1 415V Board	Demin Local Board - control	1	240v	XLPE	Copper	1.5	4	45
15.1063	1DB1 415V Board	Acid Waste System	1	415V	XLPE	Copper	6	4	35
15.1064	1DB1 415V Board	Acid Waste System - control	1	240v	XLPE	Copper	1.5	4	35
15.1065	1DB1 415V Board	Tank Filing Pump	1	415V	XLPE	Copper	10	5	40
15.1066	1DB1 415V Board	Tank Filing Pump - control	1	240v	XLPE	Copper	1.5	14	40
15.1067	1DB1 415V Board	Transfer pump	1	415V	XLPE	Copper	35	4	55
15.1068	1DB1 415V Board	Transfer pump - control	1	240v	XLPE	Copper	1.5	23	55
15.1069	1DB1 415V Board	HCL Dosing Pump	1	415V	XLPE	Copper	2.5	4	45
15.1070	1DB1 415V Board	HCL Dosing Pump - control	1	240v	XLPE	Copper	1.5	10	45
15.1071	1DB1 415V Board	Gravity Oil pump	1	415V	XLPE	Copper	2.5	4	70
15.1072	1DB1 415V Board	Gravity Oil pump - control	1	240v	XLPE	Copper	1.5	18	70
15.1073	1DB1 415V Board	Feed Make Up pump	1	415V	XLPE	Copper	4	4	55
15.1074	1DB1 415V Board	Feed Make Up pump - control	1	240v	XLPE	Copper	1.5	24	55
15.1075	1DB1 415V Board	Caustic Soda	1	415V	XLPE	Copper	4	4	30
15.1076	1DB1 415V Board	Caustic Soda - control	1	240v	XLPE	Copper	1.5	16	30
15.1077	1DB1 415V Board	Caustic Soda	1	415V	XLPE	Copper	4	4	30
15.1078	1DB1 415V Board	Caustic Soda - control	1	240v	XLPE	Copper	1.5	16	30
15.1079	1DB1 415V Board	Heat Recovery Boiler Pump	1	415V	XLPE	Copper	120	3	20
15.1080	1DB1 415V Board	Heat Recovery Boiler Pump - control	1	240v	XLPE	Copper	1.5	17	20
15.1081	1DB1 415V Board	Service Water Pump	1	415V	XLPE	Copper	10	4	27

15.1082	1DB1 415V Board	Service Water Pump - control	1	240v	XLPE	Copper	1.5	15	27
15.1083	1DB1 415V Board	Clean Drain Feed Water	1	415V	XLPE	Copper	4	4	77
15.1084	1DB1 415V Board	Clean Drain Feed Water - control	1	240v	XLPE	Copper	1.5	16	77
15.1085	1DB1 415V Board	HRB Feed Water	1	415V	XLPE	Copper	2.5	4	142
15.1086	1DB1 415V Board	HRB Feed Water - control	1	240v	XLPE	Copper	2.5	14	142
15.1087	1DB1 415V Board	Steam to Deaerator valve	1	415V	XLPE	Copper	2.5	4	195
15.1088	1DB1 415V Board	Steam to Deaerator valve - control	1	240v	XLPE	Copper	2.5	16	195
15.1089	1DA2 415V Board	Supply To Sewage	1	415V	XLPE	Copper	6	4	180
15.1090	1DA2 415V Board	Supply To Sewage - control	1	240v	XLPE	Copper	2.5	2	180
15.1091	1DA2 415V Board	Condensate Vacuum System to Discharge A	1	415V	XLPE	Copper	2.5	4	85
15.1092	1DA2 415V Board	Condensate Vacuum System to Discharge A - control	1	240v	XLPE	Copper	2.5	12	85
15.1093	1DA2 415V Board	Condensate Vacuum System to Discharge A - control	1	240v	XLPE	Copper	1.5	24	85
15.1094	1DA2 415V Board	Condensate Vacuum System to Discharge B	1	415V	XLPE	Copper	2.5	4	85
15.1095	1DA2 415V Board	Condensate Vacuum System to Discharge B - control	1	240v	XLPE	Copper	2.5	12	85
15.1096	1DA2 415V Board	Condensate Vacuum System to Discharge B - control	1	240v	XLPE	Copper	1.5	24	85
15.1097	1DA2 415V Board	Brine Heater Condensate Valve	1	415V	XLPE	Copper	2.5	4	160
15.1098	1DA2 415V Board	Brine Heater Condensate Valve - control	1	240v	XLPE	Copper	1.5	24	160
15.1099	1DA2 415V Board	Brine Heater Condensate Valve - control	1	240v	XLPE	Copper	2.5	12	160
15.1100	1DA2 415V Board	Feed Water Valve	1	415V	XLPE	Copper	2.5	4	165
15.1101	1DA2 415V Board	Feed Water Valve - control	1	240v	XLPE	Copper	2.5	12	165
15.1102	1DA2 415V Board	Vacuum Vent	1	415V	XLPE	Copper	2.5	4	214
15.1103	1DA2 415V Board	Vacuum Vent - control	1	240v	XLPE	Copper	1.5	24	214
15.1104	1DA2 415V Board	Vacuum Vent - control	1	240v	XLPE	Copper	2.5	16	214
15.1105	1DA2 415V Board	Distillate Circulation Valve	1	415V	XLPE	Copper	2.5	4	195
15.1106	1DA2 415V Board	Distillate Circulation Valve - control	1	240v	XLPE	Copper	1.5	24	195
15.1107	1DA2 415V Board	Distillate Pump Discharge B	1	415V	XLPE	Copper	2.5	4	195

15.1108	1DA2 415V Board	Distillate Pump Discharge B - control	1	240v	XLPE	Copper	1.5	24	195
15.1109	1DA2 415V Board	Distillate Pump Discharge B - control	1	240v	XLPE	Copper	2.5	12	195
15.1110	1DA2 415V Board	Cond D/A C/V LCV	1	415V	XLPE	Copper	2.5	4	310
15.1111	1DA2 415V Board	Cond D/A C/V LCV - control	1	240v	XLPE	Copper	2.5	12	310
15.1112	1DA2 415V Board	Cond D/A C/V LCV - control	1	240v	XLPE	Copper	1.5	24	310
15.1113	1DA2 415V Board	Outlet 1st Stage Ejector B	1	415V	XLPE	Copper	2.5	4	180
15.1114	1DA2 415V Board	Outlet 1st Stage Ejector B - control	1	240v	XLPE	Copper	2.5	12	180
15.1115	1DA2 415V Board	Outlet 1st Stage Ejector B - control	1	240v	XLPE	Copper	1.5	24	180
15.1116	1DA2 415V Board	Outlet 1st Stage Ejector A	1	415V	XLPE	Copper	2.5	4	185
15.1117	1DA2 415V Board	Outlet 1st Stage Ejector A - Control	1	240v	XLPE	Copper	2.5	12	185
15.1118	1DA2 415V Board	Outlet 1st Stage Ejector A - Control	1	240v	XLPE	Copper	1.5	24	185
15.1119	1DA2 415V Board	Hoist South Water Box	1	415V	XLPE	Copper	6	4	213
15.1120	1DA2 415V Board	Hoist South Water Box - control	1	240v	XLPE	Copper	2	2.5	213
15.1121	1DA2 415V Board	Strainer A outlet Valve	1	415V	XLPE	Copper	2.5	4	230
15.1122	1DA2 415V Board	Strainer A outlet Valve - control	1	240v	XLPE	Copper	2.5	2	230
15.1123	1DA2 415V Board	Strainer A outlet Valve - control	1	240v	XLPE	Copper	1.5	8	230
15.1124	1DA2 415V Board	Distillate header Control Valve	1	415V	XLPE	Copper	2.5	4	190
15.1125	1DA2 415V Board	Distillate header Control Valve - control	1	240v	XLPE	Copper	2.5	12	190
15.1126	1DA2 415V Board	Mu. Control Valve Inlet Isolator	1	415V	XLPE	Copper	2.5	4	185
15.1127	1DA2 415V Board	Mu. Control Valve Inlet Isolator - control	1	240v	XLPE	Copper	2.5	10	185
15.1128	1DA2 415V Board	Sea Water Pump B Discharge Valve	1	415V	XLPE	Copper	2.5	4	160
15.1129	1DA2 415V Board	Sea Water Pump B Discharge Valve - control	1	240v	XLPE	Copper	1.5	16	160
15.1130	1DA2 415V Board	Outlet 2 Stage Ejector B	1	415V	XLPE	Copper	2.5	4	260
15.1131	1DA2 415V Board	Outlet 2 Stage Ejector B - control	1	240v	XLPE	Copper	2.5	24	260
15.1132	1DA2 415V Board	Distillate header Control Valve	1	415V	XLPE	Copper	2.5	4	250
15.1133	1DA2 415V Board	Distillate header Control Valve - control	1	240v	XLPE	Copper	2.5	16	250

15.1134	1DA2 415V Board	Condensate Dump Control Valve	1	415V	XLPE	Copper	2.5	4	241
15.1135	1DA2 415V Board	Condensate Dump Control Valve - control	1	240v	XLPE	Copper	1.5	24	241
15.1136	1DA2 415V Board	Control Station	1	415V	XLPE	Copper	2.5	4	245
15.1137	1DA2 415V Board	Control Station - control	1	240v	XLPE	Copper	1.5	24	245
15.1138	1DA2 415V Board	Condensate D/A 5003 A outlet	1	415V	XLPE	Copper	2.5	4	270
15.1139	1DA2 415V Board	Condensate D/A 5003 A outlet / control	1	240v	XLPE	Copper	1.5	24	270
15.1140	1DA2 415V Board	Balley 120VAC Power Supply Cabinet	1	415V	XLPE	Copper	2.5	4	252
15.1141	1DA2 415V Board	Balley 120VAC Power Supply Cabinet - contro;	1	240v	XLPE	Copper	2.5	3	252
15.1142	1DA2 415V Board	Condensate Vacuum System to Discharge	1	415V	XLPE	Copper	2.5	4	265
15.1143	1DA2 415V Board	Condensate Vacuum System to Discharge - control	1	240v	XLPE	Copper	1.5	24	265
15.1144	1DA2 415V Board	Condensate System Clean tank	1	415V	XLPE	Copper	2.5	4	260
15.1145	1DA2 415V Board	Condensate System Clean tank - control	1	240v	XLPE	Copper	1.5	24	260
15.1146	1DA2 415V Board	Condensate D/n tr C/V Outlet	1	415V	XLPE	Copper	2.5	4	265
15.1147	1DA2 415V Board	Condensate D/n tr C/V Outlet - control	1	240v	XLPE	Copper	1.5	24	265
15.1148	1DA2 415V Board	Feed Water Valve B Down Stream	1	415V	XLPE	Copper	2.5	4	281
15.1149	1DA2 415V Board	Feed Water Valve B Down Stream - control	1	240v	XLPE	Copper	1.5	24	281
15.1150	1DA2 415V Board	Feed Water Valve A Down Stream	1	415V	XLPE	Copper	2.5	4	285
15.1151	1DA2 415V Board	Feed Water Valve A Down Stream - control	1	240v	XLPE	Copper	1.5	24	285
15.1152	1DA2 415V Board	Acid Valve	1	415V	XLPE	Copper	2.5	4	225
15.1153	1DA2 415V Board	Acid Valve - control	1	240v	XLPE	Copper	1.5	24	225
15.1154	1DA2 415V Board	Heater Sub Distribution Panel	1	415V	XLPE	Copper	150	4	180
15.1155	1DA2 415V Board	Heater Sub distribution Panel - control	1	240v	XLPE	Copper	2.5	2	180
15.1156	1DA2 415V Board	MU Strainer A inlet	1	415V	XLPE	Copper	2.5	4	261
15.1157	1DA2 415V Board	MU Strainer A inlet - control	1	240v	XLPE	Copper	1.5	24	261

15.1158	1DA2 415V Board	Filter Suction	1	415V	XLPE	Copper	2.5	4	190
15.1159	1DA2 415V Board	Filter Suction - Control	1	240v	XLPE	Copper	1.5	24	190
15.1160	1DA2 415V Board	Control Outlet Isolator	1	415V	XLPE	Copper	2.5	4	255
15.1161	1DA2 415V Board	Control Outlet Isolator - control	1	240v	XLPE	Copper	1.5	24	255
15.1162	1DA2 415V Board	Acid Solution To Sea Water	1	415V	XLPE	Copper	2.5	4	90
15.1163	1DA2 415V Board	Acid Solution To Sea Water - control	1	240v	XLPE	Copper	1.5	24	90
15.1164	1DA2 415V Board	Sea Water Recirculation pump Suction	1	415V	XLPE	Copper	2.5	4	277
15.1165	1DA2 415V Board	Sea Water Recirculation pump Suction - control	1	240v	XLPE	Copper	1.5	24	277
15.1166	1DA2 415V Board	AoD Valve 5WN	1	415V	XLPE	Copper	2.5	4	180
15.1167	1DA2 415V Board	AoD Valve 5WN - control	1	240v	XLPE	Copper	1.5	24	180
15.1168	1DA2 415V Board	Venting to Hogging Ejector	1	415V	XLPE	Copper	2.5	4	214
15.1169	1DA2 415V Board	Venting to Hogging Ejector - control	1	240v	XLPE	Copper	1.5	24	214
15.1170	1DA2 415V Board	Venting Inlet to 1st Stage ejector B	1	415V	XLPE	Copper	2.5	4	230
15.1171	1DA2 415V Board	Venting Inlet to 1st Stage ejector B - control	1	240v	XLPE	Copper	1.5	16	230
15.1172	1DA2 415V Board	Condensate Pump B	1	415V	XLPE	Copper	2.5	4	180
15.1173	1DA2 415V Board	Condensate Pump B - control	1	240v	XLPE	Copper	1.5	24	180
15.1174	1DA2 415V Board	HP/LP Steam valve	1	415V	XLPE	Copper	2.5	4	210
15.1175	1DA2 415V Board	HP/LP Steam valve - control	1	240v	XLPE	Copper	1.5	24	210
15.1176	Seachlore PH II	MMS No.2	2	415V	XLPE	Copper	25	4	35
15.1177	MMS No.2	Sub Main Panel	1	415V	XLPE	Copper	25	4	30
15.1178	MMS No.2	AC 1	1	415V	XLPE	Copper	25	4	29
15.1179	MMS No.2	DB- G	1	415V	XLPE	Copper	35	4	74
15.1180	MMS No.2	AC 2	1	415V	XLPE	Copper	25	4	67
15.1181	D.B - G	Mosque	1	415V	XLPE	Copper	16	4	22
15.1182	MMS No.2	DB. E	1	415V	XLPE	Copper	25	4	3
15.1183	MMS No.2	DB.F	1	415V	XLPE	Copper	25	4	18
15.1184	MMS No.2	Crane	1	415V	XLPE	Copper	25	4	17
15.1185	Chemical Store No.2 415V Board	Storm Water Sump pump 2	1	415V	XLPE	Copper	4	4	45
15.1186	Chemical Store No.2 415V Board	Storm Water Sump pump 1	1	415V	XLPE	Copper	4	4	40

15.1187	Chemical Store No.2 415V Board	Ventilation Fan 3	1	415V	XLPE	Copper	4	4	40
15.1188	Chemical Store No.2 415V Board	Ventilation Fan 2	1	415V	XLPE	Copper	4	4	39
15.1189	Chemical Store No.2 415V Board	Ventilation Fan 1	1	415V	XLPE	Copper	4	4	30
15.1190	Chemical Store No.2 415V Board	Crane	1	415V	XLPE	Copper	16	4	80
15.1191	Dist 2 415V Board	Incoming Line -0-BB-002	3	415V	XLPE	Copper	70	4	130
15.1192	Chemical Store No.2 415V Board	Power Socket panel	1	415V	XLPE	Copper	25	4	95
15.1193	Dist 2 415V Board	Alimentation MCC	1	415V	XLPE	Copper	70	4	130
15.1194	Dist 2 415V Board	Light And Outlet panel	1	415V	XLPE	Copper	70	4	130
15.1195	PH II 380V Board	3M2 Transformer	6	380V	MICC	Copper	240	1	20
15.1196	3M2 Transformer	Starting Panel C.B	3	2760V	MICC	Copper	50	1	72
15.1197	PH II 380V Board	2BT1 Transformer	11	380V	MICC	Copper	240	1	18
15.1198	2BT1 Transformer	11KV Board	3	11KV	MICC	Copper	300	1	20
15.1199	2CT1 Transformer	PH II 380V Board	9	380v	MICC	Copper	240	1	45
15.1200	2CT1 Transformer	PH II 3.3KV switchgear Room	3	3.3kv	XLPE	Copper	120	1	135
15.1201	PH II 380V Board	Starting Panel	2	380v	MICC	Copper	35	1	10
15.1202	380V Board Starting panel	Generator Exciter	2	380v	MICC	Copper	185	1	12
15.1203	GT5 11KV Board	Generator Output	16	11kv	MICC	Copper	300	1	20
15.1204	GT5 11KV Board	1AT1 Transformer	12	11kv	MICC	Copper	300	1	25
15.1205	1AT1 Transformer	66KV Substation	12	66kv	XLPE	Copper	6	3	300
15.1206	PH II 380V Board	GT5 Oil Cooling Fan No.1	1	380V	XLPE	Copper	6	3	57
15.1207	PH II 380V Board	GT5 Oil Cooling Fan No.2	1	380V	XLPE	Copper	6	3	59
15.1208	PH II 380V Board	GT5 Oil Cooling Fan No.3	1	380V	XLPE	Copper	6	3	61
15.1209	PH II 380V Board	GT5 Oil Cooling Fan No.4	1	380V	XLPE	Copper	6	3	63
15.1210	PH II 380V Board	GT5 Water Cooling Fan No.1	1	380V	XLPE	Copper	6	3	63
15.1211	PH II 380V Board	GT5 Water Cooling Fan No.2	1	380V	XLPE	Copper	6	3	65
15.1212	PH II 380V Board	GT5 Water Cooling Fan No.3	1	380V	XLPE	Copper	6	3	67
15.1213	PH II 380V Board	GT5 Water Cooling Fan No.4	1	380V	XLPE	Copper	6	3	69
15.1214	PH II 380V Board	Generator Cooling Water Motor	1	380V	XLPE	Copper	25	3	79
15.1215	PH II 380V Board	DC lube Oil Motor	1	125VDC	XLPE	Copper	4	2	75
15.1216	PH II 380V Board	Lube Oil motor	1	380V	XLPE	Copper	35	3	76
15.1217	PH II 380V Board	Cooling oil Pump motor	1	380V	XLPE	Copper	35	3	79

15.1218	PH II 380V Board	Aux Oil pump motor	1	380V	XLPE	Copper	35	3	80
15.1219	PH II 380V Board	Lube Oil Purifier	1	380V	XLPE	Copper	35	3	81
15.1220	PH II 380V Board	Gas Extraction Fan	1	380V	XLPE	Copper	35	3	83
15.1221	PH II 380V Board	Fuel Oil Pump	1	380V	XLPE	Copper	70	3	87
15.1222	PH II 380V Board	Fuel Oil Leakage pump	1	380V	XLPE	Copper	35	3	86
15.1223	PH II 380V Board	Turning Gear Motor	1	380V	XLPE	Copper	35	3	77
15.1224	Station Transformer No.1	3.3KV Station Board no.1	3	3.3kv	XLPE	Copper	300	1	112
15.1225	Station Transformer No.2	3.3KV Station Board no.2	3	3.3kv	XLPE	Copper	300	1	114
15.1226	PH II 1DA2 415V Board	Instrument Air Compressor A	1	415v	XLPE	Copper	50	4	65
15.1227	PH II 1DA2 415V Board	Instrument Air Compressor A - control	1	240v	XLPE	Copper	1.5	8	65
15.1228	PH II 1DA2 415V Board	Instrument Air Compressor B	1	415v	XLPE	Copper	50	4	63
15.1229	PH II 1DA2 415V Board	Instrument Air Compressor B - control	1	240v	XLPE	Copper	1.5	8	63
15.1230	PH II 1DA2 415V Board	Service Air Compressor A	1	415v	XLPE	Copper	50	4	75
15.1231	PH II 1DA2 415V Board	Service Air Compressor A - control	1	240v	XLPE	Copper	1.5	8	75
15.1232	PH II 1DA2 415V Board	Service Air Compressor B	1	415v	XLPE	Copper	50	4	70
15.1233	PH II 1DA2 415V Board	Service Air Compressor B - control	1	240v	XLPE	Copper	1.5	8	70
15.1234	PH II 1DA2 415V Board	Caustic soda A	1	415v	XLPE	Copper	2.5	4	62
15.1235	PH II 1DA2 415V Board	Caustic soda A - control	1	240v	XLPE	Copper	1.5	8	62
15.1236	PH II 1DA2 415V Board	Caustic soda B	1	415v	XLPE	Copper	2.5	4	60
15.1237	PH II 1DA2 415V Board	Caustic soda B - control	1	240v	XLPE	Copper	1.5	8	60
15.1238	PH II 1DA2 415V Board	Hydro Acid A	1	415v	XLPE	Copper	10	4	58
15.1239	PH II 1DA2 415V Board	Hydro Acid A - control	1	240v	XLPE	Copper	1.5	8	58
15.1240	PH II 1DA2 415V Board	Hydro Acid B	1	415v	XLPE	Copper	10	4	56
15.1241	PH II 1DA2 415V Board	Hydro Acid B - control	1	240v	XLPE	Copper	1.5	8	56
15.1242	PH II 1DA2 415V Board	Sump Pump A	1	415v	XLPE	Copper	4	4	50
15.1243	PH II 1DA2 415V Board	Sump Pump A - control	1	240v	XLPE	Copper	1.5	8	50
15.1244	PH II 1DA2 415V Board	Sump Pump B	1	415v	XLPE	Copper	4	4	50
15.1245	PH II 1DA2 415V Board	Sump Pump B - control	1	240v	XLPE	Copper	1.5	8	50
15.1246	PH II 1DA2 415V Board	Air Blower A	1	415v	XLPE	Copper	10	5	53
15.1247	PH II 1DA2 415V Board	Air Blower A - control	1	240v	XLPE	Copper	1.5	8	53
15.1248	PH II 1DA2 415V Board	Air Blower B	1	415v	XLPE	Copper	10	5	53
15.1249	PH II 1DA2 415V Board	Air Blower B - control	1	240v	XLPE	Copper	1.5	8	53

15.1250	PH II 1DA2 415V Board	Crane for Compressor House	1	415v	XLPE	Copper	50	4	62
15.1251	PH II 1DA2 415V Board	Crane for Compressor House - control	1	240v	XLPE	Copper	1.5	4	62
15.1252	PH II 1DB2 415V Board	Power Socket Panel 13/6	1	415v	XLPE	Copper	95	4	188
15.1253	PH II 1DB2 415V Board	Power Socket Panel 13/6 - control	1	240v	XLPE	Copper	2.5	4	159
15.1254	PH II 1DB2 415V Board	Inlet Valve	1	415v	XLPE	Copper	4	4	190
15.1255	PH II 1DB2 415V Board	Inlet Valve - control	1	240v	XLPE	Copper	2.5	42	191
15.1256	PH II 1DB2 415V Board	Lighting Panel	1	415v	XLPE	Copper	35	4	190
15.1257	PH II 1DB2 415V Board	Lighting Panel - control	1	240v	XLPE	Copper	1.5	3	193
15.1258	PH II 1DB2 415V Board	Power Socket Panel 14/6	1	415v	XLPE	Copper	35	4	220
15.1259	PH II 1DB2 415V Board	Power Socket Panel 14/6 - control	1	240v	XLPE	Copper	1.5	5	210
15.1260	PH II 1DB2 415V Board	Cleaning Air 19/8	1	415v	XLPE	Copper	4	4	100
15.1261	PH II 1DB2 415V Board	Cleaning Air 19/8 - control	1	240v	XLPE	Copper	1.5	5	100
15.1262	PH II 1DB2 415V Board	Power Socket 14/12	1	415v	XLPE	Copper	40	4	30
15.1263	PH II 1DB2 415V Board	Power Socket 14/12 - control	1	240v	XLPE	Copper	1.5	5	36
15.1264	PH II 1DB2 415V Board	AC west	1	415v	XLPE	Copper	6	4	40
15.1265	PH II 1DB2 415V Board	AC west - control	1	240v	XLPE	Copper	1.5	5	43
15.1266	PH II 1DB2 415V Board	AC west 14/16	1	415v	XLPE	Copper	6	4	70
15.1267	PH II 1DB2 415V Board	AC west 14/16 - control	1	240v	XLPE	Copper	1.5	5	72
15.1268	PH II 1DB2 415V Board	GRS panel	1	415v	XLPE	Copper	35	4	150
15.1269	PH II 1DB2 415V Board	GRS panel - control	1	240v	XLPE	Copper	1.5	2	150
15.1270	PH II 1DB2 415V Board	Make up Valve 15/8	1	415v	XLPE	Copper	2.5	4	190
15.1271	PH II 1DB2 415V Board	Make up Valve 15/8 - control	1	240v	XLPE	Copper	1.5	28	190
15.1272	PH II 1DB2 415V Board	Make up Valve 15/11	1	415v	XLPE	Copper	2.5	4	175
15.1273	PH II 1DB2 415V Board	Make up Valve 15/11 - control	1	240v	XLPE	Copper	1.5	28	190
15.1274	PH II 1DB2 415V Board	Make up Valve 15/14	1	415v	XLPE	Copper	2.5	4	175
15.1275	PH II 1DB2 415V Board	Make up Valve 15/14 - control	1	240v	XLPE	Copper	1.5	28	175
15.1276	PH II 1DB2 415V Board	Fuel gas 15/17	1	415v	XLPE	Copper	2.5	4	175
15.1277	PH II 1DB2 415V Board	Fuel gas 15/17 - control	1	240v	XLPE	Copper	1.5	28	175
15.1278	PH II 1DB2 415V Board	Fuel gas 15/20	1	415v	XLPE	Copper	2.5	4	140
15.1279	PH II 1DB2 415V Board	Fuel gas 15/20 - control	1	240v	XLPE	Copper	1.5	28	142
15.1280	PH II 1DB2 415V Board	HRB Feed Water Valve 16/5	1	415v	XLPE	Copper	2.5	4	110
15.1281	PH II 1DB2 415V Board	HRB Feed Water Valve 16/5 - control	1	240v	XLPE	Copper	1.5	26	110

15.1282	PH II 1DB2 415V Board	Steam vacuum 16/8	1	415v	XLPE	Copper	2.5	4	186
15.1283	PH II 1DB2 415V Board	Steam vacuum 16/8 - control	1	240v	XLPE	Copper	1.5	26	186
15.1284	PH II 1DB2 415V Board	Steam vacuum 16/11	1	415v	XLPE	Copper	2.5	4	186
15.1285	PH II 1DB2 415V Board	Steam vacuum 16/11 - control	1	240v	XLPE	Copper	1.5	26	186
15.1286	PH II 1DB2 415V Board	Dearator Overflow valve	1	415v	XLPE	Copper	2.5	4	195
15.1287	PH II 1DB2 415V Board	Dearator Overflow valve - control	1	240v	XLPE	Copper	1.5	26	186
15.1288	PH II 1DB2 415V Board	Dearator Overflow valve	1	415v	XLPE	Copper	2.5	4	195
15.1289	PH II 1DB2 415V Board	Dearator Overflow valve - control	1	240v	XLPE	Copper	1.5	26	186
15.1290	PH II 1DB2 415V Board	Dearator Overflow valve	1	415v	XLPE	Copper	2.5	4	185
15.1291	PH II 1DB2 415V Board	Dearator Overflow valve - control	1	240v	XLPE	Copper	1.5	26	186
15.1292	PH II 1DB2 415V Board	HRB circulating pump	1	415v	XLPE	Copper	2.5	4	197
15.1293	PH II 1DB2 415V Board	HRB circulating pump - control	1	240v	XLPE	Copper	1.5	33	186
15.1294	PH II 1DB2 415V Board	HRB Steam v/v	1	415v	XLPE	Copper	2.5	4	160
15.1295	PH II 1DB2 415V Board	HRB Steam v/v - control	1	240	XLPE	Copper	1.5	33	160
15.1296	PH II 1DB2 415V Board	HRB Steam v/v	1	415v	XLPE	Copper	2.5	4	168
15.1297	PH II 1DB2 415V Board	HRB Steam v/v - control	1	240v	XLPE	Copper	1.5	33	160
15.1298	PH II 1DB2 415V Board	Fuel Oil Valve	1	415v	XLPE	Copper	2.5	4	92
15.1299	PH II 1DB2 415V Board	Fuel Oil Valve - control	1	240v	XLPE	Copper	1.5	33	94
15.1300	PH II 1DB2 415V Board	Fuel Oil Valve	1	415v	XLPE	Copper	2.5	4	72
15.1301	PH II 1DB2 415V Board	Fuel Oil Valve - control	1	240v	XLPE	Copper	1.5	24	94
15.1302	PH II 1DB2 415V Board	Fuel Oil Valve	1	415v	XLPE	Copper	2.5	4	72
15.1303	PH II 1DB2 415V Board	Fuel Oil Valve - control	1	240v	XLPE	Copper	1.5	24	74
15.1304	PH II 1DB2 415V Board	Fuel Oil Valve	1	415v	XLPE	Copper	2.5	4	72
15.1305	PH II 1DB2 415V Board	Fuel Oil Valve - control	1	240v	XLPE	Copper	1.5	24	74
15.1306	PH II 1DB2 415V Board	Steam Dearator 18/11	1	415v	XLPE	Copper	2.5	4	173
15.1307	PH II 1DB2 415V Board	Steam Dearator 18/11 - control	1	240v	XLPE	Copper	1.5	28	175
15.1308	PH II 1DB2 415V Board	Steam Dearator 18/14	1	415v	XLPE	Copper	2.5	4	201
15.1309	PH II 1DB2 415V Board	Steam Dearator 18/14 - control	1	240v	XLPE	Copper	1.5	28	200
15.1310	PH II 1DB2 415V Board	Aux Boiler fuel	1	415v	XLPE	Copper	2.5	4	73
15.1311	PH II 1DB2 415V Board	Aux Boiler fuel - control	1	240v	XLPE	Copper	1.5	28	75
15.1312	PH II 1DB2 415V Board	Transfer pump	1	415v	XLPE	Copper	35	4	175
15.1313	PH II 1DB2 415V Board	Transfer pump - control	1	240v	XLPE	Copper	1.5	28	176
15.1314	PH II 1DB2 415V Board	Photocell air fan	1	415v	XLPE	Copper	2.5	4	63

15.1315	PH II 1DB2 415V Board	Photocell air fan - control	1	240v	XLPE	Copper	1.5	28	62
15.1316	PH II 1DB2 415V Board	Demin Booster pump	1	415v	XLPE	Copper	4	4	90
15.1317	PH II 1DB2 415V Board	Demin Booster pump - control	1	240v	XLPE	Copper	1.5	24	91
15.1318	PH II 1DB2 415V Board	Service Water c.w Pump	1	415v	XLPE	Copper	16	4	195
15.1319	PH II 1DB2 415V Board	Service Water c.w Pump - control	1	240v	XLPE	Copper	1.5	28	195
15.1320	PH II 1DB2 415V Board	Fuel Oil 10/5	1	415v	XLPE	Copper	2.5	4	45
15.1321	PH II 1DB2 415V Board	Fuel Oil 10/5 - control	1	240v	XLPE	Copper	1.5	24	46
15.1322	PH II 1DB2 415V Board	Feed Dosing 10/11	1	415v	XLPE	Copper	2.5	4	105
15.1323	PH II 1DB2 415V Board	Feed Dosing 10/11 - control	1	240v	XLPE	Copper	1.5	26	106
15.1324	PH II 1DB2 415V Board	Air Comp 9/5	1	415v	XLPE	Copper	4	4	90
15.1325	PH II 1DB2 415V Board	Air Comp 9/5 - control	1	240v	XLPE	Copper	1.5	24	92
15.1326	PH II 1DB2 415V Board	Phosphate valve	1	415v	XLPE	Copper	2.5	4	69
15.1327	PH II 1DB2 415V Board	Phosphate valve - control	1	240v	XLPE	Copper	1.5	26	60
15.1328	PH II 1DB2 415V Board	Feed Dosing	1	415v	XLPE	Copper	2.5	4	90
15.1329	PH II 1DB2 415V Board	Feed Dosing - control	1	240v	XLPE	Copper	1.5	26	92
15.1330	PH II 1DB2 415V Board	HRB v/v	1	415v	XLPE	Copper	70	4	94
15.1331	PH II 1DB2 415V Board	HRB v/v - control	1	240v	XLPE	Copper	1.5	28	91
15.1332	PH II 1DB2 415V Board	Feed Make Up pump	1	415v	XLPE	Copper	4	4	110
15.1333	PH II 1DB2 415V Board	Feed Make Up pump - control	1	240v	XLPE	Copper	1.5	28	108
15.1334	PH II 1DB2 415V Board	HCL Dosing Pump	1	415v	XLPE	Copper	25	4	107
15.1335	PH II 1DB2 415V Board	HCL Dosing Pump - control	1	240v	XLPE	Copper	1.5	24	100
15.1336	PH II 1DA1 415V Board	Distillate to Dump C/V	1	415v	XLPE	Copper	2.5	4	220
15.1337	PH II 1DA1 415V Board	Distillate to Dump C/V - control	1	240v	XLPE	Copper	2.5	12	220
15.1338	PH II 1DA1 415V Board	Sea Water pump A Discharge valve	1	415v	XLPE	Copper	2.5	4	290
15.1339	PH II 1DA1 415V Board	Sea Water pump A Discharge valve - control	1	240v	XLPE	Copper	1.5	24	292
15.1340	PH II 1DA1 415V Board	Sea Water pump A Discharge valve - control	1	240v	XLPE	Copper	2.5	12	292
15.1341	PH II 1DA1 415V Board	Distillate Valve 28/11	1	415v	XLPE	Copper	2.5	4	230
15.1342	PH II 1DA1 415V Board	Distillate Valve 28/11 - control	1	240v	XLPE	Copper	1.5	24	231
15.1343	PH II 1DA1 415V Board	Distillate Valve 28/11 - control	1	240v	XLPE	Copper	2.5	12	231
15.1344	PH II 1DA1 415V Board	Cond. From Vacuum v/v	1	415v	XLPE	Copper	2.5	4	230
15.1345	PH II 1DA1 415V Board	Cond. From Vacuum v/v - control	1	240v	XLPE	Copper	1.5	24	231

15.1346	PH II 1DA1 415V Board	Cond. From Vacuum v/v - control	1	240v	XLPE	Copper	2.5	12	231
15.1347	PH II 1DA1 415V Board	Blow Down inlet	1	415v	XLPE	Copper	2.5	4	270
15.1348	PH II 1DA1 415V Board	Blow Down inlet - control	1	240v	XLPE	Copper	1.5	24	271
15.1349	PH II 1DA1 415V Board	Blow Down inlet - control	1	240v	XLPE	Copper	2.5	12	271
15.1350	PH II 1DA1 415V Board	Sea water to outlet culvert	1	415v	XLPE	Copper	2.5	4	290
15.1351	PH II 1DA1 415V Board	Sea water to outlet culvert - control	1	240v	XLPE	Copper	1.5	24	292
15.1352	PH II 1DA1 415V Board	Sea water to outlet culvert - control	1	240v	XLPE	Copper	2.5	12	292
15.1353	PH II 1DA1 415V Board	Condensate Pump B	1	415v	XLPE	Copper	2.5	4	220
15.1354	PH II 1DA1 415V Board	Condensate Pump B - control	1	240v	XLPE	Copper	2.5	24	225
15.1355	PH II 1DA1 415V Board	Condensate Pump A	1	415v	XLPE	Copper	2.5	4	235
15.1356	PH II 1DA1 415V Board	Condensate Pump A - control	1	240v	XLPE	Copper	2.5	24	240
15.1357	PH II 1DA1 415V Board	HP Steam v/v	1	415v	XLPE	Copper	2.5	4	210
15.1358	PH II 1DA1 415V Board	HP Steam v/v - control	1	240v	XLPE	Copper	2.5	24	21
15.1359	PH II 1DA1 415V Board	LP Steam From Brine	1	415v	XLPE	Copper	2.5	4	212
15.1360	PH II 1DA1 415V Board	LP Steam From Brine - control	1	240v	XLPE	Copper	2.5	24	220
15.1361	PH II 1DA1 415V Board	Vacuum Vent v/v	1	415v	XLPE	Copper	2.5	4	280
15.1362	PH II 1DA1 415V Board	Vacuum Vent v/v - control	1	240v	XLPE	Copper	1.5	24	285
15.1363	PH II 1DA1 415V Board	Distillate pump A v/v	1	415v	XLPE	Copper	2.5	4	282
15.1364	PH II 1DA1 415V Board	Distillate pump A v/v - control	1	240v	XLPE	Copper	1.5	24	283
15.1365	PH II 1DA1 415V Board	Distillate pump B v/v	1	415v	XLPE	Copper	2.5	4	330
15.1366	PH II 1DA1 415V Board	Distillate pump B v/v - control	1	240v	XLPE	Copper	1.5	24	331
15.1367	PH II 1DA1 415V Board	S.W to Vent Condenser	1	415v	XLPE	Copper	2.5	4	315
15.1368	PH II 1DA1 415V Board	S.W to Vent Condenser - control	1	240v	XLPE	Copper	1.5	24	320
15.1369	PH II 1DA1 415V Board	Crane for pumping	1	415v	XLPE	Copper	50	4	300
15.1370	PH II 1DA1 415V Board	Local Panel pump A	1	415v	XLPE	Copper	4	4	200
15.1371	PH II 1DA1 415V Board	Local Panel pump A - control	1	240v	XLPE	Copper	1.5	24	220
15.1372	PH II 1DA1 415V Board	Vacuum Vent Stage 16	1	415v	XLPE	Copper	2.5	4	250
15.1373	PH II 1DA1 415V Board	Vacuum Vent Stage 16 - control	1	240v	XLPE	Copper	1.5	24	240
15.1374	PH II 1DA1 415V Board	Vacuum Vent v/v	1	415v	XLPE	Copper	2.5	4	230
15.1375	PH II 1DA1 415V Board	Vacuum Vent v/v - control	1	240v	XLPE	Copper	1.5	24	228
15.1376	PH II 1DA1 415V Board	Stripping to dearator	1	415v	XLPE	Copper	2.5	4	255
15.1377	PH II 1DA1 415V Board	Stripping to dearator	1	240v	XLPE	Copper	1.5	24	250

15.1378	PH II 1DA1 415V Board	Distillate to header V/V	1	415v	XLPE	Copper	2.5	4	240
15.1379	PH II 1DA1 415V Board	Distillate to header V/V - control	1	240v	XLPE	Copper	1.5	24	238
15.1380	PH II 1DA1 415V Board	S.W Valve	1	415v	XLPE	Copper	2.5	4	220
15.1381	PH II 1DA1 415V Board	S.W Valve - control	1	240v	XLPE	Copper	1.5	24	221
15.1382	PH II 1DA1 415V Board	Service Air Dryer	1	415v	XLPE	Copper	10	5	170
15.1383	PH II 1DA1 415V Board	Service Air Dryer - control	1	240v	XLPE	Copper	2.5	24	172
15.1384	PH II 1DA1 415V Board	LP Steam from Brine Turbine	1	415v	XLPE	Copper	2.5	4	190
15.1385	PH II 1DA1 415V Board	LP Steam from Brine Turbine - control	1	240v	XLPE	Copper	2.5	12	192
15.1386	PH II 1DA1 415V Board	HP Steam v/v	1	415v	XLPE	Copper	2.5	4	160
15.1387	PH II 1DA1 415V Board	HP Steam v/v - control	1	240v	XLPE	Copper	1.5	24	162
15.1388	PH II 1DA1 415V Board	Acid Cleaning to S.W	1	415v	XLPE	Copper	2.5	4	195
15.1389	PH II 1DA1 415V Board	Acid Cleaning to S.W - control	1	240v	XLPE	Copper	1.5	24	196
15.1390	PH II 1DA1 415V Board	Acid Cleaning Brine heater	1	415v	XLPE	Copper	2.5	4	220
15.1391	PH II 1DA1 415V Board	Acid Cleaning Brine heater - control	1	240v	XLPE	Copper	1.5	24	222
15.1392	PH II 1DA1 415V Board	S.W Winter line	1	415v	XLPE	Copper	2.5	4	250
15.1393	PH II 1DA1 415V Board	S.W Winter line - control	1	240v	XLPE	Copper	1.5	24	232
15.1394	PH II 1DA1 415V Board	Lighting panel	1	415v	XLPE	Copper	50	5	270
15.1395	PH II 1DA1 415V Board	LP Steam v/v upstream	1	415v	XLPE	Copper	2.5	4	230
15.1396	PH II 1DA1 415V Board	LP Steam v/v upstream - control	1	240v	XLPE	Copper	2.5	4	235
15.1397	PH II 1DA1 415V Board	LP Steam v/v downstream	1	415v	XLPE	Copper	2.5	4	230
15.1398	PH II 1DA1 415V Board	LP Steam v/v downstream - control	1	240v	XLPE	Copper	2.5	4	232
15.1399	PH II 1DA1 415V Board	110 VDC Battery charger	1	415v	XLPE	Copper	16	4	19
15.1400	PH II 1DA1 415V Board	110 VDC Battery charger - control	1	240v	XLPE	Copper	2.5	12	20
15.1401	PH II 1DA1 415V Board	HP Steam to Vacuum	1	415v	XLPE	Copper	2.5	4	165
15.1402	PH II 1DA1 415V Board	HP Steam to Vacuum - control	1	240v	XLPE	Copper	2.5	24	168
15.1403	PH II 1DA1 415V Board	Vacuum Vent v/v	1	415v	XLPE	Copper	2.5	4	190
15.1404	PH II 1DA1 415V Board	Vacuum Vent v/v - control	1	240v	XLPE	Copper	2.5	24	192
15.1405	PH II 1DA1 415V Board	Feed Water v/v	1	415v	XLPE	Copper	2.5	4	200
15.1406	PH II 1DA1 415V Board	Feed Water v/v - control	1	240v	XLPE	Copper	2.5	24	2020
15.1407	PH II 1DA1 415V Board	Vacuum Vent v/v	1	415v	XLPE	Copper	2.5	4	200
15.1408	PH II 1DA1 415V Board	Vacuum Vent v/v - control	1	240v	XLPE	Copper	2.5	24	201

15.1409	PH II 1DA2 415V Board	Distiller Hoist	1	415v	XLPE	Copper	16	4	223
15.1410	PH II 1DA2 415V Board	Distiller Hoist - control	1	240v	XLPE	Copper	1.5	5	223
15.1411	PH II 1DA2 415V Board	Brine Heater Condensate V/v	1	415v	XLPE	Copper	2.5	4	192
15.1412	PH II 1DA2 415V Board	Brine Heater Condensate v/v - control	1	240v	XLPE	Copper	1.5	5	35
15.1413	PH II 1DA2 415V Board	Brine Heater Condensate v/v - control	1	240v	XLPE	Copper	2	7	192
15.1414	PH II 1DA2 415V Board	Condensate from Vacuum System	1	415v	XLPE	Copper	2.5	4	79
15.1415	PH II 1DA2 415V Board	Condensate from Vacuum System - control	1	240v	XLPE	Copper	1.5	16	39
15.1416	PH II 1DA2 415V Board	Condensate from Vacuum System - control	1	240v	XLPE	Copper	2.5	7	79
15.1417	PH II 1DA2 415V Board	Feed Water HP/LP	1	415v	XLPE	Copper	2.5	4	29
15.1418	PH II 1DA2 415V Board	Feed Water HP/LP - control	1	240v	XLPE	Copper	2.5	7	40
15.1419	PH II 1DA2 415V Board	Feed Water HP/LP - control	1	240v	XLPE	Copper	1.5	16	20
15.1420	PH II 1DA2 415V Board	Battery Charger 110VDC	1	415v	XLPE	Copper	16	4	30
15.1421	PH II 1DA2 415V Board	Battery Charger 24VDC	1	415v	XLPE	Copper	16	4	27
15.1422	PH II 1DA2 415V Board	Taprogge Panel	1	415v	XLPE	Copper	25	4	169
15.1423	PH II 1DA2 415V Board	Battery 120 AC Power Supply	1	415v	XLPE	Copper	35	4	28
15.1424	PH II 1DA2 415V Board	Acid Pump	1	415v	XLPE	Copper	2.5	4	139
15.1425	PH II 1DA2 415V Board	Acid Pump - control	1	240v	XLPE	Copper	1.5	5	139
15.1426	PH II 1DA2 415V Board	Anti-scale Mixer	1	415v	XLPE	Copper	4	4	140
15.1427	PH II 1DA2 415V Board	Anti-scale Mixer - control	1	240v	XLPE	Copper	2.5	11	180
15.1428	PH II 1DA2 415V Board	Acid Dosing B	1	415v	XLPE	Copper	10	4	142
15.1429	PH II 1DA2 415V Board	Service Air Compressor	1	415v	XLPE	Copper	50	4	79
15.1430	PH II 1DA2 415V Board	Caustic Soda mixer	1	415v	XLPE	Copper	16	4	131
15.1431	PH II 1DA2 415V Board	Caustic Soda mixer - control	1	240v	XLPE	Copper	2.5	11	320
15.1432	PH II 1DA2 415V Board	Sodium Sulphite	1	415v	XLPE	Copper	4	4	129
15.1433	PH II 1DA2 415V Board	Sodium Sulphite - mixer	1	240v	XLPE	Copper	2.5	9	195
15.1434	PH II 1DA2 415V Board	Instrument Air Compressor	1	415v	XLPE	Copper	60	4	82
15.1435	PH II 1DA2 415V Board	Instrument Air Compressor - control	1	240v	XLPE	Copper	2.5	9	225
15.1436	PH II 1DA2 415V Board	Condensate Pump B	1	415v	XLPE	Copper	120	4	162
15.1437	PH II 1DA2 415V Board	Condensate Pump B - control	1	240v	XLPE	Copper	1.5	10	230
15.1438	PH II 1DA2 415V Board	Condensate Pump B - control	1	240v	XLPE	Copper	2.5	7	152

15.1439	PH II 1DA2 415V Board	Proportional speed	1	415v	XLPE	Copper	25	4	210
15.1440	PH II 1DA2 415V Board	Proportional speed - control	1	240v	XLPE	Copper	2.5	3	210
15.1441	PH II 1DA2 415V Board	LP Steam to Brine Heater	1	415v	XLPE	Copper	4	4	80
15.1442	PH II 1DA2 415V Board	Sea Water	1	415v	XLPE	Copper	2.5	4	89
15.1443	PH II 1DA2 415V Board	Sea Water - control	1	240v	XLPE	Copper	2.5	9	160
15.1444	PH II 1DA2 415V Board	Condensate B	1	415v	XLPE	Copper	2.5	4	157
15.1445	PH II 1DA2 415V Board	Condensate B - control	1	240v	XLPE	Copper	1.5	5	70
15.1446	PH II 1DA2 415V Board	Condensate B - control	1	240v	XLPE	Copper	2.5	2	162
15.1447	PH II 1DA2 415V Board	Anti-Scale Dosing B	1	415v	XLPE	Copper	2.5	4	119
15.1448	PH II 1DA2 415V Board	Anti-Scale Dosing B - control	1	240v	XLPE	Copper	1.5	7	235
15.1449	PH II 1DA2 415V Board	Anti-Scale Dosing B - control	1	240v	XLPE	Copper	2.5	4	190
15.1450	PH II 1DA2 415V Board	Caustic Soda Dosing B	1	415v	XLPE	Copper	2.5	4	118
15.1451	PH II 1DA2 415V Board	Caustic Soda Dosing B - control	1	240v	XLPE	Copper	2.5	9	185
15.1452	PH II 1DA2 415V Board	Sodium Sulphite	1	415v	XLPE	Copper	2.5	4	115
15.1453	PH II 1DA2 415V Board	Sodium Sulphite - control	1	240v	XLPE	Copper	2.5	9	185
15.1454	PH II 1DA2 415V Board	Condensate Ext.	1	415v	XLPE	Copper	2.5	4	153
15.1455	PH II 1DA2 415V Board	Condensate Ext. - control	1	240v	XLPE	Copper	1.5	18	230
15.1456	PH II 1DA2 415V Board	Condensate Ext. - control	1	240v	XLPE	Copper	2.5	2	149
15.1457	PH II 1DA1 415V Board	Acid Recycling	1	415v	XLPE	Copper	185	4	132
15.1458	PH II 1DA1 415V Board	Acid Recycling - control	1	240v	XLPE	Copper	2.5	7	130
15.1459	PH II 1DA1 415V Board	Acid Recycling - control	1	240v	XLPE	Copper	1.5	5	80
15.1460	PH II 1DA1 415V Board	MCC Workshop	1	415v	XLPE	Copper	185	6	200
15.1461	PH II 1DA1 415V Board	Service Air Compressor A	1	415v	XLPE	Copper	25	4	72
15.1462	PH II 1DA1 415V Board	Service Air Compressor A - control	1	240v	XLPE	Copper	1.5	7	120
15.1463	PH II 1DA1 415V Board	Service Air Compressor A - control	1	240v	XLPE	Copper	2.5	7	120
15.1464	PH II 1DA1 415V Board	Condensate pump A	1	415v	XLPE	Copper	120	4	152
15.1465	PH II 1DA1 415V Board	Condensate pump A - control	1	240v	XLPE	Copper	2.5	16	153
15.1466	PH II 1DA1 415V Board	Instrument Air Dryer	1	415v	XLPE	Copper	10	4	75
15.1467	PH II 1DA1 415V Board	Venting 2nd Stage Reject	1	415v	XLPE	Copper	2.5	4	140
15.1468	PH II 1DA1 415V Board	Venting 2nd Stage Reject - control	1	240v	XLPE	Copper	1.5	24	86
15.1469	PH II 1DA1 415V Board	Venting 2nd Stage Reject - control	1	240v	XLPE	Copper	2.5	16	140
15.1470	PH II 1DA1 415V Board	Instrument Air compressor	1	415v	XLPE	Copper	35	4	77

15.1471	PH II 1DA1 415V Board	Instrument Air Compressor - control	1	240v	XLPE	Copper	1.5	7	165
15.1472	PH II 1DA1 415V Board	Instrument Air Compressor - control	1	240v	XLPE	Copper	2.5	7	165
15.1473	PH II 1DA1 415V Board	Condensate to drum	1	415v	XLPE	Copper	2.5	4	153
15.1474	PH II 1DA1 415V Board	Condensate to drum - control	1	240v	XLPE	Copper	1.5	5	153
15.1475	PH II 1DA1 415V Board	Condensate Ext. A	1	415v	XLPE	Copper	25	4	170
15.1476	PH II 1DA1 415V Board	Condensate Ext. A	1	240v	XLPE	Copper	2.5	32	260
15.1477	PH II 1DA1 415V Board	Coral fo Compressor	1	415v	XLPE	Copper	16	4	120
15.1478	PH II 1DA1 415V Board	Condensate Pump	1	415v	XLPE	Copper	2.5	4	75
15.1479	PH II 1DA1 415V Board	Condensate Pump - control	1	240v	XLPE	Copper	2.5	6	220
15.1480	PH II 1DA1 415V Board	Dearator Oxygen	1	415v	XLPE	Copper	2.5	4	70
15.1481	PH II 1DA1 415V Board	Dearator Oxygen - control	1	240v	XLPE	Copper	2.5	7	170
15.1482	PH II 1DA1 415V Board	Anti-Scale Dosing	1	415v	XLPE	Copper	2.5	4	120
15.1483	PH II 1DA1 415V Board	Anti-Scale Dosing - control	1	240v	XLPE	Copper	2.5	12	230
15.1484	PH II 1DA1 415V Board	Caustic Soda	1	415v	XLPE	Copper	2.5	4	122
15.1485	PH II 1DA1 415V Board	Caustic Soda - control	1	240v	XLPE	Copper	2.5	7	122
15.1486	PH II 1DA1 415V Board	Sodium Sulphite	1	415v	XLPE	Copper	2.5	4	128
15.1487	PH II 1DA1 415V Board	Sodium Sulphite - control	1	240v	XLPE	Copper	2.5	7	225
15.1488	PH II 1DA1 415V Board	Instrument Power Supply	1	415v	XLPE	Copper	35	4	71
15.1489	PH II 1DA1 415V Board	Anti-Foam Mixer	1	415v	XLPE	Copper	10	4	126
15.1490	PH II 1DA1 415V Board	Condensate De Supper Heater	1	415v	XLPE	Copper	2.5	4	123
15.1491	PH II 1DA1 415V Board	Condensate De Supper Heater - control	1	240v	XLPE	Copper	1.5	11	184
15.1492	PH II 1DA1 415V Board	Condensate De Supper Heater - control	1	240v	XLPE	Copper	2.5	7	184
15.1493	PH II 1DA1 415V Board	Sodium Sulphite	1	415v	XLPE	Copper	25	4	213
15.1494	PH II 1DA1 415V Board	Sodium Sulphite - control	1	240v	XLPE	Copper	2	2	126
15.1495	PH II 1DA1 415V Board	Sea Water Lubrication	1	415v	XLPE	Copper	4	4	126
15.1496	PH II 1DA1 415V Board	Sea Water Lubrication - control	1	240v	XLPE	Copper	2.5	2	92
15.1497	PH II 1DA1 415V Board	Feed Water to HP/LP	1	415v	XLPE	Copper	4	4	92
15.1498	PH II 1DA1 415V Board	Feed Water to HP/LP - control	1	240v	XLPE	Copper	1.5	16	179
15.1499	PH II 1DA1 415V Board	Feed Water to HP/LP - control	1	240v	XLPE	Copper	2.5	7	179
15.1500	PH II 1DA1 415V Board	Heaters Sub Distribution1	1	415v	XLPE	Copper	2.5	4	231
15.1501	PH II 1DA1 415V Board	Heaters Sub Distribution1 - control	1	240v	XLPE	Copper	2.5	2	90

15.1502	PH II 1DA1 415V Board	Heaters Sub Distribution2	1	415v	XLPE	Copper	16	4	236
15.1503	PH II 1DA1 415V Board	Heaters Sub Distribution2 - control	1	240v	XLPE	Copper	2.5	2	90
15.1504	PH II 1DA1 415V Board	Blow down C/V Bypass	1	415v	XLPE	Copper	16	4	193
15.1505	PH II 1DA1 415V Board	Blow down C/V Bypass - control	1	240v	XLPE	Copper	2.5	7	193
15.1506	PH II 1DA1 415V Board	Blow down C/V Bypass - control	1	240v	XLPE	Copper	1.5	16	193
15.1507	PH II 1DA1 415V Board	Brine Pump Discharge valve	1	415v	XLPE	Copper	2.5	4	172
15.1508	PH II 1DA1 415V Board	Brine Pump Discharge valve - control	1	240v	XLPE	Copper	2.5	7	172
15.1509	PH II 1DA1 415V Board	Brine Pump Discharge valve - control	1	240v	XLPE	Copper	1.5	16	172
15.1510	PH II 1DA1 415V Board	S.W to outlet culvert	1	415v	XLPE	Copper	2.5	4	121
15.1511	PH II 1DA1 415V Board	S.W to outlet culvert - control	1	240v	XLPE	Copper	1.5	16	121
15.1512	PH II 1DA1 415V Board	S.W to outlet culvert - control	1	240v	XLPE	Copper	2.5	7	121
15.1513	PH II 1DA1 415V Board	Oil Pump for Turbine	1	415v	XLPE	Copper	2.5	4	192
15.1514	PH II 1DA1 415V Board	Oil Pump for Turbine - control	1	240v	XLPE	Copper	2.5	9	192
15.1515	PH II 1DA1 415V Board	Mu C/C Bypass	1	415v	XLPE	Copper	35	4	182
15.1516	PH II 1DA1 415V Board	Mu C/C Bypass - control	1	240v	XLPE	Copper	1.5	16	182
15.1517	PH II 1DA1 415V Board	Mu C/C Bypass - control	1	240v	XLPE	Copper	2.5	7	182
15.1518	PH II 1DA1 415V Board	Acid Dosing pump	1	415v	XLPE	Copper	25	4	152
15.1519	PH II 1DA1 415V Board	Acid Dosing pump -control	1	240v	XLPE	Copper	2.5	9	200
15.1520	PH II 1DA1 415V Board	Vent inlet II	1	415v	XLPE	Copper	10	4	183
15.1521	PH II 1DA1 415V Board	Vent inlet II - control	1	240v	XLPE	Copper	1.5	24	183
15.1522	PH II 1DA1 415V Board	Vent inlet II - control	1	240v	XLPE	Copper	2.5	16	183
15.1523	PH II 1DA1 415V Board	Anti-Scale mixer	1	415v	XLPE	Copper	25	4	128
15.1524	PH II 1DA1 415V Board	Anti-Scale mixer - control	1		XLPE	Copper	2.5	4	240
15.1525	PH II 1DA1 415V Board	LP Steam from HP/LP 1	1	415v	XLPE	Copper	4	4	152
15.1526	PH II 1DA1 415V Board	LP Steam from HP/LP - control	1	240v	XLPE	Copper	2.5	24	152
15.1527	PH II 1DA1 415V Board	LP Steam from HP/LP 2	1	415v	XLPE	Copper	4	4	152
15.1528	PH II 1DA1 415V Board	LP Steam from HP/LP - control	1	240v	XLPE	Copper	2.5	24	152
15.1529	PH II 1DA1 415V Board	Condensate Pump	1	415v	XLPE	Copper	25	4	153
15.1530	PH II 1DA1 415V Board	Condensate Pump - control	1	240v	XLPE	Copper	1.5	10	153
15.1531	PH II 1DA1 415V Board	Condensate Pump - control	1	240v	XLPE	Copper	2.5	2	153
15.1532	PH II 1DA1 415V Board	Dist to Dump	1	415v	XLPE	Copper	2.5	4	181
15.1533	PH II 1DA1 415V Board	Dist to Dump - control	1	240v	XLPE	Copper	2.5	7	181
15.1534	PH II 1DA1 415V Board	Dist to Dump - control	1	240v	XLPE	Copper	15	16	181

15.1535	PH 1 CW 415V Board	MMS No.1 DB2	1	415v	XLPE	Copper	240	4	195
15.1536	PH 1 CW 415V Board	MMS No.1 DB1	1	415v	XLPE	Copper	185	4	205
15.1537	MMS No.1 DB1	Sockets 13A	2	240v	XLPE	Copper	16	4	32
15.1538	MMS No.1 DB2	Lathe Machine No.1	1	415v	XLPE	Copper	20	3	26
15.1539	MMS No.1 DB2	Lathe Machine No.2	1	415v	XLPE	Copper	20	3	22
15.1540	MMS No.1 DB2	Lathe Machine No.3	1	415v	XLPE	Copper	20	3	23
15.1541	MMS No.1 DB2	Crane	1	415v	XLPE	Copper	25	4	17
15.1542	MMS No.1 DB2	MMS No.1 DB3	1	415v	XLPE	Copper	25	4	3
15.1543	MMS No.1 DB3	Threading Machine	1	415v	XLPE	Copper	25	4	29
15.1544	MMS No.1 DB3	125A Socket	1	415v	XLPE	Copper	35	4	39
15.1545	MMS No.1 DB3	125A Socket	1	415v	XLPE	Copper	35	4	8
15.1546	MMS No.1 DB3	Hacksaw Machine	1	415v	XLPE	Copper	25	4	11
15.1547	MMS No.1 DB3	Drilling Machine	1	415v	XLPE	Copper	16	4	9
15.1548	MMS No.1 DB3	AC No.1	1	415v	XLPE	Copper	25	4	25
15.1549	MMS No.1 DB3	AC No.2	1	415v	XLPE	Copper	25	4	37
15.1550	MMS No.1 DB3	MMS No.1 DB4	1	415v	XLPE	Copper	35	4	1
15.1551	MMS DB4	MMS Compressor	1	415v	XLPE	Copper	25	4	10
15.1552	MMS DB4	Wall Fan	9	240v	XLPE	Copper	16	4	80
15.1553	MMS DB4	Store AC	1	240v	XLPE	Copper	6	4	29
15.1554	MMS DB5	IMS AC 1,2,3	3	240v	XLPE	Copper	6	4	20
15.1555	MMS DB5	MMS Kitchen	2	240v	XLPE	Copper	6	4	72
15.1556	MMS DB3	MMS DB5	1	240v	XLPE	Copper	25	4	15
15.1557	MMS DB2	MMS DB6	1	240v	XLPE	Copper	35	4	38
15.1558	MMS DB5	Wall Search Light	6	240v	XLPE	Copper	6	3	110
15.1559	MMS DB5	Roof Light	18	240v	XLPE	Copper	6	3	200
15.1560	MMS STORE DB	Split AC	2	240v	XLPE	Copper	6	3	25
15.1561	MMS STORE DB	Exhaust Fan	2	240v	XLPE	Copper	6	3	40
15.1562	MMS STORE DB	AC Central	2	240v	XLPE	Copper	25	3	45
15.1563	PH I C.W 415V Board	EMS Store	3	415V	XLPE	Copper	300	4	71
15.1564	EMS STORE	EMS AC	1	415V	XLPE	Copper	50	4	10
15.1565	EMS STORE	IMS AC	1	415V	XLPE	Copper	40	4	23
15.1566	EMS STORE	EMS Lighting	1	415V	XLPE	Copper	24	4	5
15.1567	EMS STORE	IMS Store supply	1	415V	XLPE	Copper	70	4	20
15.1568	EMS STORE	MMS AC	1	415V	XLPE	Copper	35	4	65
15.1569	EMS STORE	EMS/IMS Old Offices	1	415V	XLPE	Copper	70	4	36

15.1570	EMS STORE	MMS Main D.B	1	415V	XLPE	Copper	240	4	72
15.1571	New Admin D.B	Lecture Room 18/19 AC &Sockets	6	240V	XLPE	Copper	6	3	10
15.1572	IMS DB2	IMS AC	6	415V	XLPE	Copper	6	3	18
15.1573	IMS DB2	IMS Crane	1	415V	XLPE	Copper	20	3	11
15.1574	IMS DB2	OVEN	1	415V	XLPE	Copper	6	3	11
15.1575	IMS DB1	Isolator 4	4	415V	XLPE	Copper	16	4	30
15.1576	Main Supply from Top of IMS	IMS D.B	1	415V	XLPE	Copper	35	5	15
15.1577	Chlorination panel	IMS Up Panel	1	415V	XLPE	Copper	120	3	170
15.1578	IMS DB1	IMS Lighting	15	415V	XLPE	Copper	2.5	3	40
15.1579	IMS DB1	IMS AC 6	11	415V	XLPE	Copper	6	3	33
15.1580	IMS DB	IMS Socket	20	415V	XLPE	Copper	4	3	50
15.1581	IMS DB	IMS Ac Central	1	415V	XLPE	Copper	35	3	20
15.1582	PH I C.W 415V Board	EMS Workshop DB	1	415V	XLPE	Copper	120	5	40
15.1583	EMS Workshop	EMS Workshop DB	1	415V	XLPE	Copper	35	4	27
15.1584	EMS Workshop	Winding Workshop	1	415V	XLPE	Copper	35	4	15
15.1585	EMS Workshop	IMS 2	1	415V	XLPE	Copper	35	4	45
15.1586	EMS Workshop	Rigging Store	1	415V	XLPE	Copper	35	4	85
15.1587	EMS Workshop	Welding Workshop	1	415V	XLPE	Copper	35	4	25
15.1588	EMS Workshop	EMS AC Central	3	415V	XLPE	Copper	35	4	20
15.1589	Winding Workshop DB	Carpenter Wood Machine	3	415V	XLPE	Copper	16	3	30
15.1590	Winding Workshop DB	Sitting Room Lighting	1	415V	XLPE	Copper	2.5	3	15
15.1591	Winding Workshop DB	Sitting Room AC 1&2	2	415V	XLPE	Copper	16	3	19
15.1592	Winding Workshop DB	Sitting Room Socket 2	1	415V	XLPE	Copper	4	3	17
15.1593	Winding Workshop DB	Winding Workshop Ex. FAN 2	1	415V	XLPE	Copper	16	3	35
15.1594	Winding Workshop DB	Winding Workshop 13A Socket	1	415V	XLPE	Copper	16	3	30
15.1595	Winding Workshop DB	Winding Workshop Ex. FAN 1	1	415V	XLPE	Copper	16	3	35
15.1596	Winding Workshop DB	Winding Workshop 125A Socket	1	415V	XLPE	Copper	25	3	25
15.1597	winding Workshop DB	winding w/s isolator crane	1	415	XLPE	Copper	20	4	12
15.1598	winding Workshop DB	winding w/s shatter door	1	415	XLPE	Copper	16	4	30
15.1599	winding Workshop DB	winding drill machine	1	415	XLPE	Copper	16	4	15
15.1600	winding Workshop DB	carpenter w/s ac	1	415	XLPE	Copper	16	4	30
15.1601	winding Workshop DB	winding air compressor	1	415	XLPE	Copper	16	4	20
15.1602	winding Workshop DB	winding isolator No.3	1	415	XLPE	Copper	16	4	55
15.1603	winding Workshop DB	test (M) isolator	1	415	XLPE	Copper	16	4	14

15.1604	winding Workshop DB	E.M.S SECOND FLOOR OFFICE	1	415	XLPE	Copper	35	4	32
15.1605	winding Workshop DB	I.M.S SECOND FLOOR OFFICE	1	415	XLPE	Copper	25	4	21
15.1606	winding Workshop DB	I.M.S 2 AIR COMP	1	415	XLPE	Copper	25	4	28
15.1607	DB1	67,62,63,64,65 STREAT LIGHT	1	415	XLPE	Copper	16	4	171
15.1608	DB1	66-1-2-3-4-5-6 STREAT LIGHT	1	415	XLPE	Copper	16	4	170
15.1609	PH I C.W 415V board	DB1	1	415	XLPE	Copper	16	4	35
15.1610	DB1	72-73-74 STREET LIGHT	1	415	XLPE	Copper	16	4	100
15.1611	DB1	70-71-74 STREET LIGHT	1	415	XLPE	Copper	16	4	100
15.1612	DB1	67-68 Street Light	1	415	XLPE	Copper	16	4	53
15.1613	DB5	60-59-58-57-56 STREET LIGHT	1	415	XLPE	Copper	16	4	140
15.1614	DB5	55-54-53-52-51-50 STREET LIGHT	1	415	XLPE	Copper	16	4	145
15.1615	DB5	80-79-78-77-76 STREET LIGHT	1	415	XLPE	Copper	16	4	148
15.1616	DB4	82-83-90-91 STREET LIGHT	1	415	XLPE	Copper	16	4	135
15.1617	DB4	88-88-87-86-85-84 STREET LIGHT	1	415	XLPE	Copper	16	4	110
15.1618	DB4	91-92-93-94-95 STREET LIGHT	1	415	XLPE	Copper	16	4	164
15.1619	Chemical Store No.1 415V Board	Socket Outlet panel	1	240V	XLPE	Copper	2.5	3	45
15.1620	Chemical Store No.1 415V Board	Light And Outlet panel	1	415V	XLPE	Copper	70	4	4
15.1621	Chemical Store No.1 415V Board	Battery Charger	1	220V	XLPE	Copper	2.5	3	40
15.1622	Chemical Store No.1 415V Board	Power And Socket Outlet	1	415V	XLPE	Copper	50	4	43
15.1623	Chemical Store No.1 415V Board	Ventilation Fan No.1	1	415V	XLPE	Copper	2.5	4	20
15.1624	Chemical Store No.1 415V Board	Ventilation Fan No.2	1	415V	XLPE	Copper	2.5	4	37
15.1625	Chemical Store No.1 415V Board	AC Unit	1	220V	XLPE	Copper	2.5	3	28
15.1626	Chemical Store No.1 415V Board	General Lighting	1	220V	XLPE	Copper	2.5	3	80
15.1627	Chemical Store No.2 BA-001 415V Board	Chemical Store No.2 OBB-002 415V Board	1	415V	XLPE	Copper	95	3	170
15.1628	Chemical Store No.2 BA-001 415V Board	Chemical Store No.2 OBB-002 415V Board	1	415V	XLPE	Copper	95	3	170

15.1629	Chemical Store No.2 415V Board	0BB-002	Chemical Store No.2 415V Board	0BB-001	1	415V	XLPE	Copper	95	3	64
15.1630	Chemical Store No.2 415V Board	0BB-002	Chemical Store No.2 415V Board	0BB-001	1	415V	XLPE	Copper	95	3	64
15.1631	Chemical Store No.2 415V Board	0BB-002	Cooling water pump crane		1	415V	XLPE	Copper	50	3	75
15.1632	Chemical Store No.2 415V Board	0BB-002	Power Socket Outlet		1	415V	XLPE	Copper	50	3	45
15.1633	Chemical Store No.2 415V Board	0BB-002	MCC-0BB-001		1	415V	XLPE	Copper	95	3	60
15.1634	Chemical Store No.2 415V Board	0BB-002	Sump pump No.1		1	415V	MICC	Copper	2.5	3	60
15.1635	Chemical Store No.2 415V Board	0BB-002	Sump pump No.2		1	415V	MICC	Copper	2.5	3	60
15.1636	Chemical Store No.2 415V Board	0BB-002	General Lighting		1	240V	XLPE	Copper	2.5	3	100
15.1637	Chemical Store No.2 415V Board	0BB-002	Socket Outlet		1	240V	XLPE	Copper	2.5	3	65
15.1638	Unit Transformer No.1		Excitation Transformer No.1		3	3.3kv	XLPE	Copper	70	1	19
15.1639	Unit Transformer No.2		Excitation Transformer No.2		3	3.3kv	XLPE	Copper	70	1	4
15.1640	Unit Transformer No.3		Excitation Transformer No.3		3	3.3kv	XLPE	Copper	70	1	18
15.1641	Unit Transformer No.4		Excitation Transformer No.4		3	3.3kv	XLPE	Copper	70	1	22
15.1642	Excitation Transformer No.1		AVR panel No.1		6	240v	XLPE	Copper	240	1	6
15.1643	Excitation Transformer No.2		AVR panel No.2		6	240v	XLPE	Copper	240	1	5
15.1644	Excitation Transformer No.3		AVR panel No.3		6	240v	XLPE	Copper	240	1	6
15.1645	Excitation Transformer No.4		AVR panel No.4		6	240v	XLPE	Copper	240	1	16
15.1646	AVR panel No.1		T/A1 Sliprings		6	240v	XLPE	Copper	240	1	10
15.1647	AVR panel No.2		T/A2 Sliprings		6	240v	XLPE	Copper	240	1	16
15.1648	AVR panel No.3		T/A3 Sliprings		6	240v	XLPE	Copper	240	1	15
15.1649	AVR panel No.4		T/A4 Sliprings		6	240v	XLPE	Copper	240	1	12
15.1650	3.3KV Station Board 1		DCR DP		1	415v	XLPE	Copper	25	4	35
15.1651	DCR DP		Package AC UNIT 1		1	415v	XLPE	Copper	16	4	41
15.1652	DCR DP		Package AC UNIT 2		1	415v	XLPE	Copper	16	4	48
15.1653	Thermal Room No.1		Isolator No.1		1	415v	XLPE	Copper	25	4	65
15.1654	Isolator No.1		Package AC UNIT 1		1	415v	XLPE	Copper	16	4	4
15.1655	Thermal Room No.1		Isolator No.2		1	415v	XLPE	Copper	25	4	52
15.1656	Isolator No.2		Package AC UNIT 2		1	415v	XLPE	Copper	16	4	6

15.1657	Thermal Room No.2	Isolator No.1	1	415v	XLPE	Copper	25	4	71
15.1658	Isolator No.1	Package AC UNIT 1	1	415v	XLPE	Copper	16	4	7
15.1659	Isolator No.2	Package AC UNIT 2	1	415v	XLPE	Copper	25	4	55
15.1660	Turbine Hall DP	3.3KV Station Board 2	1	415v	XLPE	Copper	6	4	52
15.1661	Relay Room	Relay Room	1	415v	XLPE	Copper	0.5	20	80
15.1662	Relay Room	Relay Room	1	415v	XLPE	Copper	0.5	4	50
15.1663	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	15	70
15.1664	Relay Room	Relay Room	1	415v	XLPE	Copper	2.5	5	75
15.1665	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	15	66
15.1666	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	4	40
15.1667	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	15	80
15.1668	Relay Room	Relay Room	1	415v	XLPE	Copper	1	10	70
15.1669	Relay Room	Relay Room	1	415v	XLPE	Copper	1	20	95
15.1670	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	2	80
15.1671	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	15	70
15.1672	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	30	100
15.1673	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	15	105
15.1674	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	30	108
15.1675	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	5	119
15.1676	Relay Room	Relay Room	1	415v	XLPE	Copper	2.5	2	111
15.1677	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	4	90
15.1678	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	2	80
15.1679	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	15	75
15.1680	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	15	80
15.1681	Relay Room	Relay Room	1	415v	XLPE	Copper	1	30	90
15.1682	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	30	70
15.1683	Relay Room	Relay Room	1	415v	XLPE	Copper	1	10	75
15.1684	Relay Room	Relay Room	1	415v	XLPE	Copper	1	4	90
15.1685	Relay Room	Relay Room	1	415v	XLPE	Copper	2.5	2	120
15.1686	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	10	80
15.1687	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	7	100
15.1688	Relay Room	Relay Room	1	415v	XLPE	Copper	2.5	2	111
15.1689	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	15	101
15.1690	Relay Room	Relay Room	1	415v	XLPE	Copper	0.5	50	105
15.1691	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	15	130

15.1692	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	15	117
15.1693	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	20	101
15.1694	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	30	100
15.1695	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	15	90
15.1696	Relay Room	Relay Room	1	415v	XLPE	Copper	1	15	70
15.1697	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	30	100
15.1698	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	4	120
15.1699	Relay Room	Relay Room	1	415v	XLPE	Copper	4	4	130
15.1700	Relay Room	Relay Room	1	415v	XLPE	Copper	10	4	100
15.1701	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	30	95
15.1702	Relay Room	Relay Room	1	415v	XLPE	Copper	2.5	6	80
15.1703	Relay Room	Relay Room	1	415v	XLPE	Copper	2.5	2	90
15.1704	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	5	90
15.1705	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	5	85
15.1706	Relay Room	Relay Room	2	415v	XLPE	Copper	2.5	2	80
15.1707	Relay Room	Relay Room	2	415v	XLPE	Copper	2.5	4	75
15.1708	Relay Room	Relay Room	6	415v	XLPE	Copper	1.5	15	60
15.1709	Relay Room	Relay Room	1	415v	XLPE	Copper	1	30	55
15.1710	Relay Room	Relay Room	2	415v	XLPE	Copper	1.5	5	80
15.1711	Relay Room	Relay Room	2	415v	XLPE	Copper	1	50	85
15.1712	Relay Room	Relay Room	2	415v	XLPE	Copper	1.5	30	70
15.1713	Relay Room	Relay Room	2	415v	XLPE	Copper	1.5	6	70
15.1714	Relay Room	Relay Room	2	415v	XLPE	Copper	2.5	6	70
15.1715	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	30	80
15.1716	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	50	80
15.1717	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	20	90
15.1718	Relay Room	Relay Room	1	415v	XLPE	Copper	1.5	4	93
15.1719	L.V.A.C - DB7 - UTx2	STATION BOARD-2 INCOMING	1	415v	XLPE	Copper	16	4	4
15.1720	L.V.A.C - DB7 - UTx3	STATION BOARD-2 INCOMING	2	415v	XLPE	Copper	1.5	30	180
15.1721	L.V.A.C - DB7 - UTx4	STATION BOARD-2 INCOMING	1	415v	XLPE	Copper	1.5	15	185
15.1722	L.V.A.C - DB7 - UTx5	STATION BOARD-2 INCOMING	1	415v	XLPE	Copper	1.5	7	190
15.1723	L.V.A.C - DB7 - UTx6	STATION BOARD-2 INCOMING	1	415v	XLPE	Copper	1.5	3	188
15.1724	GTx-2 BOARD	GTx-2	1	415v	XLPE	Copper	1.5	15	190
15.1725	GTx-2 BOARD	GTx-2	7	415v	XLPE	Copper	1.5	4	188
15.1726	Relay Room	STATION TRANSFORMER-1	3	415v	XLPE	Copper	1.5	15	166

15.1727	Relay Room	STATION TRANSFORMER-1	1	415v	XLPE	Copper	1.5	4	166
15.1728	Relay Room	UNIT TRANSFORMER-1	3	415v	XLPE	Copper	1.5	15	160
15.1729	Relay Room	UNIT TRANSFORMER-1	1	415v	XLPE	Copper	1.5	7	155
15.1730	Relay Room	UNIT TRANSFORMER-1	1	415v	XLPE	Copper	1.5	3	158
15.1731	Relay Room	GTx-1	2	415v	XLPE	Copper	1.5	30	160
15.1732	Relay Room	GTx-1	2	415v	XLPE	Copper	1.5	15	166
15.1733	Relay Room	GTx-1	6	415v	XLPE	Copper	1.5	4	165
15.1734	Relay Room	GTx-1	8	415v	XLPE	Copper	1.5	3	170
15.1735	Relay Room	GT-5 TRANSFORMER	3	415v	XLPE	Copper	1.5	30	533
15.1736	Relay Room	GT-5 TRANSFORMER	4	415v	XLPE	Copper	1.5	4	533
15.1737	Relay Room	GT-5 TRANSFORMER	4	415v	XLPE	Copper	1.5	7	500
15.1738	Relay Room	GT-5 TRANSFORMER	2	415v	XLPE	Copper	1.5	4	520
15.1739	Relay Room	GT-5 TRANSFORMER	4	415v	XLPE	Copper	1.5	3	520
15.1740	Relay Room	UNIT TRANSFORMER-4	1	415v	XLPE	Copper	1.5	50	250
15.1741	Relay Room	UNIT TRANSFORMER-4	1	415v	XLPE	Copper	1.5	30	260
15.1742	Relay Room	UNIT TRANSFORMER-4	1	415v	XLPE	Copper	1.5	7	260
15.1743	Relay Room	UNIT TRANSFORMER-4	1	415v	XLPE	Copper	1.5	3	270
15.1744	Relay Room	GTx-4	5	415v	XLPE	Copper	1.5	7	260
15.1745	Relay Room	GTx-4	1	415v	XLPE	Copper	1.5	30	265
15.1746	Relay Room	GTx-4	1	415v	XLPE	Copper	1.5	15	250
15.1747	Relay Room	STATION TRANSFORMER-2	3	415v	XLPE	Copper	1.5	30	195
15.1748	Relay Room	STATION TRANSFORMER-2	1	415v	XLPE	Copper	1.5	15	190
15.1749	Relay Room	STATION TRANSFORMER-2	2	415v	XLPE	Copper	1.5	7	193
15.1750	Relay Room	STATION TRANSFORMER-2	2	415v	XLPE	Copper	1.5	4	199
15.1751	Relay Room	UNIT TRANSFORMER-3	2	415v	XLPE	Copper	1.5	30	230
15.1752	Relay Room	UNIT TRANSFORMER-3	1	415v	XLPE	Copper	1.5	15	235
15.1753	Relay Room	UNIT TRANSFORMER-3	1	415v	XLPE	Copper	1.5	3	235
15.1754	Relay Room	GTx-3	3	415v	XLPE	Copper	1.5	30	240
15.1755	Relay Room	GTx-3	2	415v	XLPE	Copper	1.5	15	250
15.1756	Relay Room	GTx-3	6	415v	XLPE	Copper	1.5	4	244
15.1757	PH III 0-BA-001 415V Board	Light Outlet Panel	1	415v	XLPE	Copper	16	4	18
15.1758	PH III 0-BA-001 415V Board	Power Socket Panel	1	415v	XLPE	Copper	16	4	12
15.1759	PH III 0-BA-001 415V Board	240V Aux. Control	1	415v	XLPE	Copper	2.5	2	6
15.1760	PH III 0-BA-001 415V Board	Control Voltage Transformer	1	415v	XLPE	Copper			4
15.1761	PH III 0-BA-001 415V Board	Incomer 4-Ba-001	1	415v	XLPE	Copper	95	4	85

15.1762	PH III 0-BA-001 415V Board	4-BA-001	1	415v	XLPE	Copper	95	4	105
15.1763	PH III 0-BA-001 415V Board	Dist 2,3,4 Power Socket	1	415v	XLPE	Copper	32	4	39
15.1764	PH III 0-BA-001 415V Board	2Ta-001 Aux Supply	1	415v	XLPE	Copper	2.5	4	22
15.1765	PH III 0-BA-001 415V Board	3Ta-001 Aux Supply	1	415v	XLPE	Copper	2.5	4	29
15.1766	PH III 0-BA-001 415V Board	4Ta-001 Aux Supply	1	415v	XLPE	Copper	2.5	4	34
15.1767	PH III 0-BA-001 415V Board	Fire Panel in DCR	1	415v	XLPE	Copper	6	3	173
15.1768	PH III 0-BA-001 415V Board	Air Cond. Fan Coil B(8)	1	415v	XLPE	Copper	2.5	4	12
15.1769	PH III 0-BA-001 415V Board	Air Cond. Fan Coil B(9)	1	415v	XLPE	Copper	2.5	4	20
15.1770	PH III 0-BA-001 415V Board	Extraction Fan Battery Room 1	1	415v	XLPE	Copper	2.5	4	9
15.1771	PH III 0-BA-001 415V Board	Extraction Fan Battery Room 2	1	415v	XLPE	Copper	2.5	4	14
15.1772	PH III 0-BA-001 415V Board	AC UNIT 1	1	415v	XLPE	Copper	32	4	27
15.1773	PH III 0-BA-001 415V Board	AC UNIT 2	1	415v	XLPE	Copper	32	4	34
15.1774	PH III 0-BA-001 415V Board	AC UNIT 3	1	415v	XLPE	Copper	32	4	42
15.1775	PH III 0-BA-001 415V Board	Heater BB-007	1	415v	XLPE	Copper	10	4	16
15.1776	PH III 0-BA-001 415V Board	Dist. 2,3,4 Float pump	1	415v	XLPE	Copper	2.5	3	45
15.1777	T/A 1	Neutral Transformer No.1	1	11KV	XLPE	Copper	240	1	25
15.1778	T/A 2	Neutral Transformer No.2	1	11KV	XLPE	Copper	240	1	14
15.1779	T/A 3	Neutral Transformer No.3	1	11KV	XLPE	Copper	240	1	20
15.1780	T/A 4	Neutral Transformer No.4	1	11KV	XLPE	Copper	240	1	17

16. Station Electrical Boards



- **Manufacturers:** ESI MILANO, EMQ, CGE, BBC, ABB, etc.
- **Capacity:** Varies
- **Voltages:** 11KV, 3.3KV and 415 Vac, etc.

No	Item/Equipment / Classification	Photo/ Drawing	Q	Description	Major Material
16.1	Sitra Sub-store - Chemical mixers		1	415V Size: 215 X 50 X 230cm Manufacturer: ESI MILANO	Copper/Steel
16.2	Welding Section 1-DE-1		1	415V 600A Size:255 X 70 X 260cm Manufacturer: EMQ	Copper/Steel
16.3	Welding Section - Distillate p/p house switchboard		1	415V 31MVA Size: 180 X 60 X 208cm Manufacturer: EMQ	Copper/Steel
16.4	Ph-III, Chemical Store-1 - 0-BB-001		1	415V Size: 170 X 60 X 229cm Manufacturer: CGE	Copper/Steel
16.5	Ph-III, Chemical Store-2 0-BB-002		1	415V Size: 170 X 60 X 229cm Manufacturer: CGE	Copper/Steel
16.6	Ph-II, GT-5		1	380V Size:80 X 82 X 220cm Manufacturer: BBC	Copper/Steel
16.7	Ph-II, GT-5		1	11KV 2500A Size: 37 X 210 X 220cm Manufacturer: BBC	Copper/Steel
16.8	Ph-II, 3.3 KV switchgear -1-CA-1		1	3.3KV 1500A Size: 533 X 200 X 226cm Manufacturer: Elemart SPA	Copper/Steel
16.9	Ph-II, 3.3 KV switchgear-1-CA-2		1	3.3KV 1500A Size: 465 X 200 X 226cm Manufacturer: Elemart SPA	Copper/Steel
16.10	Ph-II, 415 V switchgear 1-DA-1		1	415V 2000A Size: 1700 X 50 X 230cm Manufacturer: CEI	Copper/Steel
16.11	Ph-II, 415 V switchgear 1-DA-2		1	415V 2000A Size: 1700 X 50 X 230cm Manufacturer: CEI	Copper/Steel
16.12	Ph-II, 415 V switchgear 1-DB-1		1	415V 1000A Size: 1445 X 50 X 230cm Manufacturer: CEI	Copper/Steel
16.13	Ph-II, 415 V switchgear 1-DB-2		1	415V 1000A Size: 1445 X 50 X 230cm Manufacturer: CEI	Copper/Steel
16.14	Ph-II, 415 V switchgear 1-DC-1		1	415V 1000A Size: 450 X 50 X 230cm Manufacturer: CEI	Copper/Steel
16.15	Ph-II, 415 V switchgear 1-DC-2		1	415V 1000A Size: 450 X 50 X 230cm Manufacturer: CEI	Copper/Steel
16.16	Ph-II, 415 V switchgear 1-DD-1		1	415V 1000A Size: 375 X 50 X 230 cm Manufacturer: CEI	Copper/Steel
16.17	Ph-II, 415 V switchgear 1-DD-2		1	415V 1000A Size: 375 X 50 X 230 cm Manufacturer: CEI	Copper/Steel
16.18	Ph-III, Dist.2 switchgear 2-AA-001		1	3.3KV 2500A Size: 235 X 219 X 223cm Manufacturer: Italia Pianti	Copper/Steel
16.19	Ph-III, Dist.2 switchgear 2-AA-002		1	3.3KV 1600A Size: 523 X 219 X 222cm Manufacturer: Italia Pianti	Copper/Steel
16.20	Ph-III, Dist.3 switchgear 3-AA-001		1	3.3KV 2500A Size: 235 X 219 X 223cm Manufacturer: Italia Pianti	Copper/Steel
16.21	Ph-III, Dist.3 switchgear 3-AA-002		1	3.3KV 1600A Size: 523 X 219 X 222cm Manufacturer: Italia Pianti	Copper/Steel
16.22	Ph-III, Dist.4 switchgear 4-AA-001		1	3.3KV 2500A Size: 235 X 219 X 223cm Manufacturer: Italia Pianti	Copper/Steel

16.23	Ph-III, Dist.4 switchgear 4-AA-002	1	3.3KV 1600A Size: 523 X 219 X 222cm Manufacturer: Italia Pianti	Copper/Steel
16.24	Ph-III, Dist.2 switchgear 2-BA-001	1	415V 2000A Size: 510 X 119 X 227cm Manufacturer: CGE	Copper/Steel
16.25	Ph-III, Dist.3 switchgear 3-BA-001	1	415V 2000A Size: 510 X 119 X 227cm Manufacturer: CGE	Copper/Steel
16.26	Ph-III, Dist.4 switchgear 4-BA-001	1	415V 2000A Size: 510 X 119 X 227cm Manufacturer: CGE	Copper/Steel
16.27	Ph-III, Dist2,3,4 0-BA001	1	415V Size: 510 X 119 X 227cm Manufacturer: CGE	Copper/Steel
16.28	Ph-I, Dist.1A Board 00BGA	1	415V 1370A Size: 242 X 66 X 221cm Manufacturer: ABB	Copper/Steel
16.29	Ph-I, Dist.1B Board 00BGB	1	415V 1370A Size: 242 X 66 X 221cm Manufacturer: ABB	Copper/Steel
16.30	PH-I, CWI Boards 1&2	1	415V Size: 598 X 59 X 216cm Manufacturer: Wallace town	Copper/Steel
16.31	Ph-I, Seacholre 415V 0-BB-003	1	415V Size: 225 X 232 X 60cm Manufacturer: CGE	Copper/Steel
16.32	PH-I, Unit Board-1	1	3.3KV 150MVA Size: 170 X 190 X 250cm Manufacturer: Whipp & Bourne	Copper/Steel
16.33	PH-I, Unit Board-2	1	3.3KV 150MVA Size: 170 X 190 X 250cm Manufacturer: Whipp & Bourne	Copper/Steel
16.34	PH-I, Unit Board-3	1	3.3KV 150MVA Size: 170 X 190 X 250cm Manufacturer: Whipp & Bourne	Copper/Steel
16.35	PH-I, Unit Board-4	1	3.3KV 150MVA Size: 170 X 190 X 250cm Manufacturer: Whipp & Bourne	Copper/Steel
16.36	PH-I, Station Board-1	1	3.3KV 150MVA Size: 530 X 190 X 250 cm Manufacturer: Whipp & Bourne	Copper/Steel
16.37	PH-I, Station Board-2	1	3.3KV 150MVA Size: 530 X 190 X 250 cm Manufacturer: Whipp & Bourne	Copper/Steel
16.38	PH-I, Unit Aux. Board-1	1	415V 26MVA Size:209 X 60 X 220cm Manufacturer: ABB	Copper/Steel
16.39	PH-I, Unit Aux. Board-2	1	415V 26MVA Size:209 X 60 X 220cm Manufacturer: ABB	Copper/Steel
16.40	PH-I, Unit Aux. Board-3	1	415V 26MVA Size:209 X 60 X 220cm Manufacturer: ABB	Copper/Steel
16.41	PH-I, Unit Aux. Board-4	1	415V 26MVA Size:209 X 60 X 220cm Manufacturer: ABB	Copper/Steel
16.42	PH-I, Station Aux.Board-1	1	415V 26MVA Size: 600 X 60 X 220 cm Manufacturer: ABB	Copper/Steel
16.43	PH-I, Station Aux.Board-2	1	415V 26MVA Size: 600 X 60 X 220 cm Manufacturer: ABB	Copper/Steel
16.44	PH-I, General Aux.Board-1	1	415V Size: 175 X 60 X 215 cm Manufacturer: Wallace town	Copper/Steel
16.45	PH-I, General Aux.Board-2	1	415V Size: 175 X 60 X 215 cm Manufacturer: Wallace town	Copper/Steel
16.46	PH-I, General Aux.Board-3	1	415V Size: 285 X 95 X 210 cm Manufacturer: JC	Copper/Steel

16.47	PH-I, Demin Plant 0-BB-005	1	415V Size: 260 X 60 X 230 Manufacturer: CGE	Copper/Steel
16.48	RT101 Control panel	1	415V Size: 260 X 60 X 230 Manufacturer: FIME-FRIEM	Copper/Steel
16.49	RT102 Control panel	1	415V Size: 260 X 60 X 230 Manufacturer: FIME-FRIEM	Copper/Steel
16.50	RT103 Control panel	1	415V Size: 260 X 60 X 230 Manufacturer: FIME-FRIEM	Copper/Steel
16.51	PH-I & III, Chathodic Protection Panel	1	415V Size: 140 X 80 X 40cm Manufacturer: Bristols	Copper/Steel
16.52	PH-II, Hypochlorination Control Unit	1	415V Size: 200 X 140 X 100	Copper/Steel
16.53	PH-II, Cathodic Protection Panel	1	415V Size: 195 X 96 X 60 Manufacturer: wilson walton	Copper/Steel
16.54	PH-II, EL1 control	1	415V Size: 200 X 135 X 80cm	Copper/Steel
16.55	PH-II, EL2 control	1	415V Size: 200 X 135 X 80cm	Copper/Steel
16.56	PH-III, DC / DC Converter	1	415V Size: 170 X 60 X 500 cm Manufacturer: Trezzano (Milano-Italia)	Copper/Steel
16.57	PH-I, AVR 1 PANEL	1	415V Size: 222 X 212 X 100cm Manufacturer: Ansaldo	Copper/Steel
16.58	PH-I, AVR 2 PANEL	1	415V Size: 222 X 212 X 100cm Manufacturer: Ansaldo	Copper/Steel
16.69	PH-I, AVR 3 PANEL	1	415V Size: 222 X 212 X 100cm Manufacturer: Ansaldo	Copper/Steel
16.60	PH-I AVR 4 PANEL	1	415V Size: 222 X 212 X 100cm Manufacturer: Ansaldo	Copper/Steel
16.61	Ph-I, Bank-11 (240V) Charger	1	Float 280V - Boost 340V, 50A, Size: 160 X 80 X 210cm, Manufacturer : HBL	Copper/Steel
16.62	Ph-I, Bank-12 (240V) Charger	1	Float 280V - Boost 340V, 50A, Size: 160 X 80 X 210cm, Manufacturer : HBL	Copper/Steel
16.63	Ph-I, Bank-21 (240V) Charger	1	Float 280V - Boost 340V, 50A, Size: 160 X 80 X 210cm, Manufacturer : HBL	Copper/Steel
16.64	Ph-I, Bank-22 (240V) Charger	1	Float 280V - Boost 340V, 50A, Size: 160 X 80 X 210cm, Manufacturer : HBL	Copper/Steel
16.65	Ph-I, UPS System-1 (220V) charger	1	230V, 36A, Size: 135 X 80 X 180 cm, Manufacturer : SVS	Copper/Steel
16.66	Ph-I, UPS System-2 (220V) charger	1	230V, 36A, Size: 135 X 80 X 180 cm, Manufacturer : SVS	Copper/Steel
16.67	Ph-I, DCS System-1 (24v)	1	Float 21V - Boost 26V, 500A, Size: 120 X 80 X 220 cm, Manufacturer : SVS	Copper/Steel
16.68	Ph-I, DCS System-2 (24v)	1	Float 21V - Boost 26V, 500A, Size: 120 X 80 X 220, Manufacturer : SVS	Copper/Steel
16.69	Ph-II, GT5 control Room (125V) charger 1	1	Float 125V - Boost 135V, 80A, Size: 80 X 82 X 220 cm, Manufacturer : BBC	Copper/Steel

16.70	Ph-II, GT5 control Room (125V) charger 2	1	Float 125V - Boost 135V, 80A, Size: 80 X 82 X 220 cm, Manufacturer : BBC	Copper/Steel
16.71	Ph-II, GT5 control Room (24V) charger 1	1	float 27V - Boost 29V, 20A, Size: 80 X 82 X 220 cm, Manufacturer : BBC	Copper/Steel
16.72	Ph-II, GT5 control Room (24V) charger 2	1	float 27V - Boost 29V, 20A, Size: 80 X 82 X 220 cm, Manufacturer : BBC	Copper/Steel
16.73	Ph-II, Distiller-5 110VDC Charger 1	1	Float 126V - Boost 153V, 100A, Size: 320 X 80 X 190 cm, Manufacturer: SAB NIFE	Copper/Steel
16.74	Ph-II, Distiller-5 110VDC Charger 2	1	Float 126V - Boost 153V, 100A, Size: 320 X 80 X 190 cm, Manufacturer: SAB NIFE	Copper/Steel
16.75	Ph-II, Distiller-5 24VDC Charger 1	1	Float 28V - Boost 34V, 170A, Size: 320 X 80 X 190 cm, Manufacturer: SAB NIFE	Copper/Steel
16.76	Ph-II, Distiller-5 24VDC Charger 2	1	Float 28V - Boost 34V, 170A, Size: 320 X 80 X 190 cm, Manufacturer: SAB NIFE	Copper/Steel
16.77	Ph-III, Distiller-2 Battery Charger (220V)	1	Float 234V - Boost 268V, 68A, Size: 180 X 80 X 170cm, Manufacturer: ITALIA PIANTI	Copper/Steel
16.78	Ph-III, Distiller-4Battery Charger (220V)	1	Float 234V - Boost 268V, 68A, Size: 180 X 80 X 170cm, Manufacturer: ITALIA PIANTI	Copper/Steel

17. Phase-I, II & III Seachlore Plants



Hypochlorination plant

- There are two Hypo-Chlorination plants

17.1. Phase-I, II & III Seachlore Plants - Mechanical Parts:

Phase I - Seachlore Plant

No	Item/Equipment / Classification	photo/ Drawing	Q	Description	Major Material
17.1.1	Hypo Injection Pumps		3	MFR: R.S. Corcoran Model: BSP Ms-100-65-250 Centrifugal pump	Carbon Steel
17.1.2	Service & Hypochlorite Collecting Tank		1	Type: O-XH- TK-102, MFT: SGUSSERO H= 2800 mm , D= 2300 mm	Carbon Steel
17.1.3	Service & Hypochlorite Acid Tank		1	Model: O-WN- TK -101 H= 1900 mm , D= 500 mm	Carbon Steel
17.1.4	Acid Transfer Pump (KSB)		1	MFR: KSB Centrifugal pump	Carbon Steel
17.1.5	Caustic soda Dosing Pump		1	Centrifugal pump Capacity: 90 Nm ³ /h	Carbon Steel
17.1.6	Caustic Soda Storage Tank		1	Type O-WP-TK-101 H: 1120 mm , D: 550 mm	Carbon Steel
17.1.7	Degassing Fan		2	Cap – 400Nm³/h Width: 150 mm	Carbon Steel
17.1.8	Purging Fan		2	Type; CMR-1135-2T Mfr.: Aeromeccanica Stranich	Carbon Steel
Phase II - Seachlore Plant					
17.1.9	Hypo Injection Pumps A & B		2	Model: P-Nr3- N16-559972 Centrifugal pump Head: 20m, Speed: 1450 RPM	Carbon Steel
17.1.10	Service Water Pumps		2	Model: S-WE-M-1001C, MAN lteam – T 1700 Centrifugal pump	Carbon Steel

17.1.11	Acid Cleaning pumps	2	MFR: KSB Model: 5-WC-M-1001C Centrifugal pump	Carbon Steel
17.1.12	Purging Fan	2	Model: H-0.2 Capacity: 1800Nm ³ /h	Carbon Steel
17.1.13	Sea Water Inlet Basket Filters A & B	2	Basket Filters	Carbon Steel
17.1.14	Hypo chloride Acid Tank TK1001A	1	D: 2950 mm H: 3500 mm	Carbon Steel
17.1.15	Hypo chloride Tank A & B TK1001B	2	D: 2950 mm H: 3500 mm	Carbon Steel
17.1.16	Butterfly Valves	8	Size: 8 inches	Carbon Steel
17.1.17	Butterfly Valves	3	Size: 6 inches	Carbon Steel
17.1.18	Butterfly Valves	11	Size: 4 inches	Carbon Steel
17.1.19	Butterfly Valves	6	Size: 3 inches	Carbon Steel
17.1.20	Non-Return Valve	2	Size: 8 inches	Carbon Steel
17.1.21	Non-Return Valve	9	Size: 4 inches	Carbon Steel
17.1.22	Gate Valve	2	Size: 6 inches	Carbon Steel
17.1.23	Diaphragm Valve	10	Size: 4 inches	Carbon Steel
17.1.24	Diaphragm Valve	4	Size: 3 inches	Carbon Steel

17.2. Phase-I, II & III Seachlore Plants – Electrical Parts:

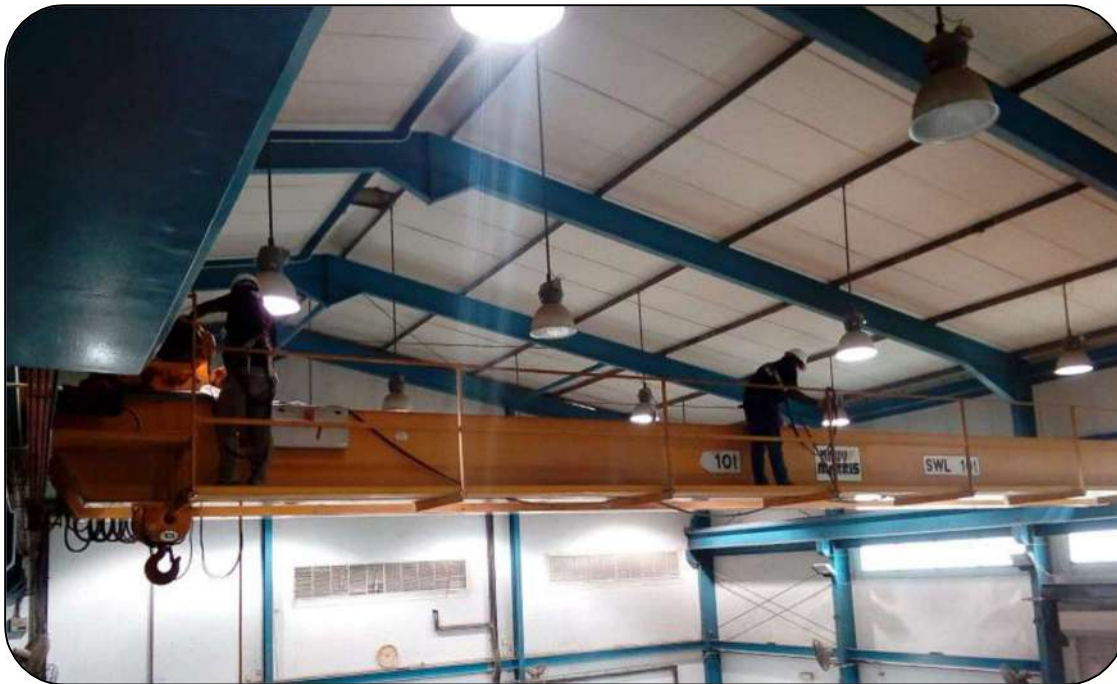
No	Item/Equipment / Classification	photo/ Drawing	Q	Description	Major Material
17.2.1	Electrode for PH I & III		9	ELECTRODE, ASSEMBLY SUITABLE FOR ELECTROLYSER TYPE: H10C 66D, HORIZONTAL MOUNTING, RATED LOAD CURRENT: 900 AMPS, D.C. VOLTAGE: 40 - 45, ACTIVE CHLORINE AT RATED CURRENT 30 KG/H, TEST PRESSURE 4 BAR, SEA WATER FLOW RATE 20 CUMH, SEA WATER TEMPERATURE 15-35 DEG.C, MFR DENORA PERMELECX- SPA, ITALY.	TITANIUM
17.2.2	Electrode for PH II		4	ELECTRODE, ASSY TITANIUM ELECTROLYSER TYPE: 10M1X15+1 VERT.MNTG, RATED CURRENT:1500A RATED VOL: 40-45VDC, ACTIVE CHLORINE PRODUCTIO N AT RATED CURRENT:32KG/H, SEA WATER TEMP. 20- 35 DEG.C, SEA WATER FLOW RATE:16CU M/H, SEA WATER PRESS. 2 BAR, FOR HYPOCHLORINATION PLANT OF DIST 5, MFR: DENORA.	TITANIUM
17.2.3	PH-I, Degassing fan Motor		2	Frame Size: 112M, Voltage: 415V, Power: 4 KW, Speed: 1435 RPM, Total Weight: 45 Kg	Copper/Steel
17.2.4	PH-I, Purging Fan Motor		2	Frame Size: 90 L, Voltage: 415V, Power: 2.2 KW, Speed: 2860 RPM, Total Weight: 15 Kg	Copper/Steel
17.2.5	PH-I, Hypo Inject Pump Motor		3	Frame Size: 132, Voltage: 415V, Power: 9 KW, Speed: 1455 RPM, Total Weight: 58 Kg	Copper/Steel
17.2.6	PH-II, Chlorination pump motor		3	Frame Size: 112M, Voltage: 415V, Power: 4 KW, Speed: 1435 RPM, Total Weight: 45Kg	Copper/Steel
17.2.7	PH-II, Hypo-chloric injection pump motor		4	Frame Size: KAI-071NBB019Z, Voltage: 415V, Power: 0.33 KW, Speed: 1440 RPM, Total Weight: 19Kg	Copper/Steel
17.2.8	PH-II, Acid Cleaning Motor		2	Frame Size: KA1-100L, Voltage: 415V, Power: 2.5 KW, Speed: 1435 RPM, Total Weight: 16Kg	Copper/Steel
17.2.9	PH-II, Air Purging motor		2	Frame Size: 90L2, Voltage: 415V, Power: 2.2 KW, Speed: 2900 RPM, Total Weight: 16Kg	Copper/Steel

17.3. Phase-I, II & III Seachlore Plants - Instrumentation Parts:

17.3.1	Control Valve		1	SEVERN GLOCON, DN3"	Carbon Steel
17.3.2	ON-OFF Valve		3	ALFA VALVOLE	Aluminum Alloy
17.3.3	ON-OFF Valve		2	MASONEILAN, VALVE, CONTROL COMPLETE CAMFLEX II, BODY SIZE: 1.1/2"	Carbon Steel
17.3.4	Pressure Switch		4	Gönnheimer Elektronik GmbH, druckwächter DW 812	Aluminum Alloy

17.3.5	Flow Switch	2	OFFICINE OROBICHE, MODEL PL-P-2-MI1	Aluminum Alloy
17.3.6	Level Transmitter	1	ROSEMOUNT pressure transmitter / 0 to 248 kpa	Aluminum Alloy
17.3.7	Pressure Gauge	18	NUOVA FIMA MP2	stainless steel
17.3.8	Temperature Gauge	2	Wika en-13190	stainless steel
17.3.9	Level Indicator	2	Pressure Gauge Nuova FIMA, 0-6 mH2O	stainless steel
17.3.10	Level Indicator	2	SONIX with two Sensors	stainless steel
17.3.11	Air Filter Regulator	10	Fisher-USA, Type: FS-67CFR-226	Carbon Steel
17.3.12	Flow Transmitters	2	Mfr:Kent TIEGHI SPA-ITALY, Type: P3000F-KM	stainless steel
17.3.13	Level Transmitters	2	Pneumatic Diff Tx.Mfr:Kent TIEGHI SPA-ITALY, Model: N-AE	stainless steel
17.3.14	Solenoid Valves	8	ASCO product of Mexico, Model E-F8003GR,2-WAY 1/4" V/V	stainless steel
17.3.15	Thermowell	2	Technomatic-Italy ,RTD	stainless steel
17.3.16	Pressure Gauge	19	Budenberg Teflon Protection Diaphragm	stainless steel
17.3.16	Flow Switch	19	OFFICINE OROBICH POTERANICA-ITALY I/P:8vdc,O/P:250 V AC	Carbon Steel

18. Plant Cranes



- **Manufacturers: Carruthers, Prim Sesto, Morris, Chisholm Moore, Pupinto Treviso, etc.**
- **Capacity: Max 45 Ton and Min 0.25 Ton**
- **Total Cranes in SPWS: 35 No.**

18.1. Phase – I Cranes

Sl. No	Name / Plant	Capacity (Tons)	Mfr.	Rope / Chain		Motor Capacity, KW		
				Spec.	Main Hoist	Aux. Hoist	Bridge	Trolley
18.1.1	Turbine Hall	45 / 10	Carruthers	8/2 falls	33.6	18.5	2 x 2.6	3
18.1.2	Dist. 1A/1B S.W Pit	5	Prim Sesto	2 fall	6	-	2 x 0.75	0.75
18.1.3	Dist. 1A , Dosing, Chain	0.25	King PCT El.	2 fall	0.56			
18.1.4	Dist. D House, Chain	0.25	Morris	1 fall	0.4		0.16	
18.1.5	Fire Pump House, Chain Block- Manual	2	Chisholm Moore	2 fall				
18.1.6	Ph-1 Demin	2	Unelec	1 fall				

18.2. PHASE - II Cranes

18.2.1	Ph-2 Demin & Comp. House	1.5	Pupinto Treviso	2 falls	3.3		2 x 0.25	0.35
18.2.2	Ph-2 Intake Platform, Chain Block- Manual	6	Morris	2 falls				
18.2.3	Dist. 5 East Semi- Gantry	35	Puppinto Treviso	8 falls	Apr-18		2 x 5.5	2.2
18.2.4	Dist. 5 North Water Box	6	unelec	2 falls				
18.2.5	Dist. 5 South Water Box	6	Unelec	2 falls				
18.2.6	GT-5 Hall	16	Pupinto Treviso	4 falls	18		2 x 1.47	1.47
18.2.7	Ph-2 Seachlor House	1.5	Pupinto Treviso	2 falls	3.3		2 x 0.25	0.35
18.2.8	Dist. 5 Dosing	0.5	Pupinto Treviso	1 falls				

18.3. PHASE - III Cranes

18.3.1	Dist.2 West Water Box	5.5	Defries Titano	2 falls	1.5 / 8.5	0.08 / 0.04	0.18
18.3.2	Dist.2 East Water Box	5.5	Defries Titano	2 falls	1.5 / 8.5	0.08 / 0.04	0.18
18.3.3	Dist.2 South Dosing- Chain	0.25	Unelec	1 fall	0.9	0.06	
18.3.4	Dist.2 North Dosing- Chain	0.25	Unelec	1 fall	0.9	0.06	
18.3.5	Dist.2 Brine Heater, Chain	1	Verlinde				
18.3.6	Dist.3 West Water Box	5.5	Defries Titano	2 falls	1.5 / 8.5	0.08 / 0.04	0.18
18.3.7	Dist.3 East Water Box	5.5	Defries Titano	2 falls	1.5 / 8.5	0.08 / 0.04	0.18
18.3.8	Dist.3 North Dosing- Chain	0.25	Morris	1 fall	0.4	0.16	
18.3.9	Dist.3 Brine Heater, Chain	1	Verlinde				
18.3.10	Dist.4 West Water Box	5.5	Defries Titano	2 falls	1.5 / 8.5	0.08 / 0.04	0.18
18.3.11	Dist.4 East Water Box	5.5	Defries Titano	2 falls	1.5 / 8.5	0.08 / 0.04	0.18
18.3.12	Dist.4 South Dosing- Chain	0.25	Unelec	1 falls	0.9	0.06	
18.3.13	Dist.4 North Dosing- Chain	0.25	Unelec	1 falls	0.9	0.06	
18.3.14	Dist.4 Brine Heater, Chain	1	Verlinde				
18.3.15	Ph-3 S.W Pumps	16	Defries Titano	4 falls	1.5 / 12.2	0.15 / 0.6	0.3 / 1.1
18.3.16	Ph-3 Brine Pumps	30	Defries Titano	8 falls	Mar-25	0.37 / 1.2	0.15 / 0.6
18.3.17	Demister Pads Cleaning Area	2	Morris	2 falls			

19. Control System



- **Distributed Control System ABB Procontrol 14**
- **Foxboroc SPEC-200 control system PLC System**
- **SIMATIC S7**
- **Bailey Controls 7000 Series Electronic Control System**
- **Secontic Control System, TR76 Temperature Control, Electrical Excitation, Generator Protection, Static Frequency Converter (SFC) and Hydraulic System on Gas Turbine Generating Unit Type 9 Brown, Boveri (BBC)**
- **Allen Bradley Micrologix 1400 PLC**
- **PLC System, Siemens S7-1500/ PLC-S7-200**

19.1 Phase-I Steam turbines, Boilers and Distiller 1A & 1B (Distributed Control System ABB Procontrol 14)

Sr. NO	Electronics Modules Description	ON HAND	Installed	Total
19.1.1	OUTPUT MODULE FOR ANALOG SIGNALS,MFR:ABB, GERMANY (S2261-10-07553), Modules no. 81AA03, Identification no. R1210	1	4	5
19.1.2	OUTPUT MODULE FOR BINARY SIGNALS, MFR:ABB, GERMANY (S2261-10-07552), Modules no. 81AB03, Identification no. R1210	2	38	40
19.1.3	INPUT MODULE FOR ANALOG SIGNALS INDEPENDENT OF POTENTIAL, MFR:MFR:ABB, GERMANY (S2261-10-07555), Modules no. 81EA04, Identification no. R1210	1	40	41
19.1.4	UNIVERSAL INPUT MODULE FOR BINARY AND ANALOG TRANSMITTERS, MFR: ABB, GERMANY (S2261-10-07544) , Modules no. 81EU01, Identification no. R1210	9	187	196
19.1.5	CONTROL MODULE FOR BINARY CONTROL FUNCTION 4-FOLD // FOR ANALOG CONTROL FUNCTION 1-4 FOLD, MFR: ABB, GERMANY (S2261-10-07550) , Modules no. 83SR04, Identification no. R1210	2	156	158
19.1.6	CONTROL MODULE FOR ANALOG CONTROL FUNCTION WITH CONTINUOUS OUTPUT, 2- FOLD, MFR: ABB, GERMANY R3559-62-07085, Modules no. 83SR51, Identification no. R1210	2	4	6
19.1.7	COUPOING MODULE - COUPLING A PROCONTROL STATION TO THE FDDI, MFR: ABB, GERMANY S2261-10-07543, Modules no. 88TK50, Identification no. R1210	4	58	62
19.1.8	DEVICE, CONTROL, 2-FOLD, TYPE: 83SR07 R1210, FOR PROCONTROL (P- 14), OF BOILERS 1-4 & DIST 1A/1B D.C.S., MFR: ABB, GERMANY. S2261-10-07551, Modules no. 83SR07, Identification no. R1210	0	53	53
19.1.9	BIN CONTROL MODULE 4-FOLD, MFR: ABB, GERMANY S2261-10-07554, Modules no. 83SR04, Identification no. R1411	2	96	98
19.1.10	COUPLER, FOR PMS/POS, TYPE: 87TS51R1210 HMI, FOR PROCONTROL (P-14), OF BOILERS 1-4 & DIST 1A/1B D.C.S., MFR: ABB, GERMANY. new, Modules no. 87TS50, Identification no. R1214	3	3	6
19.1.11	COUPLER, FOR PMS/POS, TYPE: 87TS51R1210 HMI, FOR PROCONTROL (P-14), OF BOILERS 1-4 & DIST 1A/1B D.C.S., MFR: ABB, GERMANY. new (S2261-10-07545) , Modules no. 87TS51, Identification no. R1210	0	0	0
19.1.12	INTERFACE, SERIAL TO CLOCK PULSE, TYPE: 87TS01R 1313, FOR PROCONTROL (P- 14), OF BOILERS 1-4 & DIST 1A/1B D.C.S., MFR: ABB, GERMANY. (S2261-10-07549) , Modules no. 87TS01, Identification no. R1313	0	6	6

19.1.13	INTERFACE, SERIAL CDS, TYPE: 87TS01R 1550, FOR PROCONTROL (P- 14) SYSTEM OF PHASE 1 BOILERS & DISTILLER, MFR: ABB, GERMANY. (S2261-10-07547) , Modules no. 87TS01, Identification no. R1550	1	0	1
19.1.14	INTERFACE, SERIAL CDS, TYPE: 87TS01R 1551, FOR PROCONTROL (P- 14), OF BOILERS 1-4 & DIST 1A/1B D.C.S., MFR: ABB, GERMANY. (S2261-10-07548) , Modules no. 87TS01, Identification no. R1551	0	0	0
19.1.15	INTERFACE, SERIAL PDAS/PRODAR, MFR: ABB, GERMANY (S2261-10-07546) , Modules no. 87TS01, Identification no. R1545	3	0	3
19.1.16	POWER SUPPLY, MFR: ABB, GERMANY (S2261-30-07556) , Modules no. 89NG08, Identification no. R1000	0	12	12
19.1.17	SUPPLY MODULE, MFR: ABB, GERMANY (S2261-30-07557) , Modules no. 89NG11, Identification no. R0100	0	0	0
19.1.18	RELAY OUTPUT MODULE, MFR: ABB, GERMANY (S2259-45-07559) , Modules no. 81AR01, Identification no. R0100	4	36	40
19.1.19	MODULE, FUSING, TYPE: 89XV01 R0100, FOR PROCONTROL (P-14), OF BOILERS 1-4 & DIST 1A/1B D.C.S., MFR: ABB, GERMANY. (S2259-20-07558) , Modules no. 89XV01, Identification no. R0100	0	48	48

19.2 Phase-III Distiller 2, 3 and 4 (PLC System SIMATIC S7 integrated with Foxboroc SPEC-200 Control System)

Sr. No.	PLC System SIMATIC S7 Description	ON HAND	Installed	Total
19.2.1	SIMATIC S7-300 STABILIZED POWER SUPPLY PS307 INPUT: 120/230 V AV OUTPUT: 24V DC/ 5 A, Identification no. 6ES7307-1EA00-0AA0	0	4	4
19.2.2	SIMATIC S7-300 STABILIZED POWER SUPPLY PS307 INPUT: 120/230 V AV OUTPUT: 24V DC/ 10 A, Identification no. 6ES7321-1BL00-0AA0	0	12	12
19.2.3	SIMATIC S7-300 CPU 315-2 PN/DP, CENTRAL PROCESSING UNIT WITH 384 KBYTE WORKING MEMORY, 1 INTERFACE MPI/DP 12 MBIT/S. INTERFACE ENTERNET PROFINT WITH 2 PORT SWITH, MICRO MEMORY CARD NECESSARY, Identification no. 6ES7315-2EH14-0AB0	0	4	4
19.2.4	SIMATC S7, MICRO MEMORY CARD P. S70300/C7/ ET200, 3.3 V NFLASH, 2 MBYTES, Identification no. 6ES7953-8LL20-0AA0	0	4	4
19.2.5	SIMATC S7, MICRO MEMORY CARD P. S70300/C7/ ET200, 3.3 V NFLASH, 64 MBYTES, Identification no. 6ES7953-8LF20-0AA0	0	8	8

19.2.6	SIMATIC S7-300, DIGITAL OUTAGE SM 322, OPTICALLY ISOLATED, 32DO, 24V DC, 0.5A, 1 X 40 PIN, SUM OF OUTPUT CURRENTS 4A/ GROUP (16A/MODULE) , Identification no. 6ES7322-1AJ30-0AA0	2	25	27
19.2.7	SIMATIC S7-300, DIGITAL INPUT SM 321, OPTICALLY ISOLATED 32DI, 24 V DC, 1 X 40 PIN, Identification no. 6ES7321-1BL00-0AA0	2	51	53
19.2.8	SIMATIC DP, ET 200M INTERFACE IM 153-4 PN IO FOR MAX. 12 S7-300 MODLES EXTENED FUNCTIONS: ISOCHRONEOUE REALTIME COMMUNICATION CLASS 1 AND 2, MODULE EXCHANGE W/O PG, OPRATION W/O MMC MAINTENANCE NEW 10 MODULES ARE SUPPORTED, Identification no. 6ES7153-4AA01-0XB0	0	8	8
19.2.9	SIMATIC DP, BUS CONNECTOR FOR PROFIBUS UP TO 12 MBIT/S 90 DEGREE ANGLE CABLE OUTLET, IPCD TECHNOLOGY FAST CONNECT, WITH PG SOCKET, Identification no. 6ES7153-4AA01-0XB0	0	9	9
19.2.10	SIMATIC S7-300, RAIL L=480MM, Identification no. 6ES7390-1AE80-0AA0	0	4	4
19.2.11	SIMATIC S7-300, RAIL L=830MM , Identification no. 6ES7390-1AE80-0AA0	0	8	8
19.2.12	SIMATC S7-300, FRONT CONNECTOR 392 WITH SCREW CONTACTS, 40-PIN, Identification no. 6ES7392-1AM00-0AA0	0	76	76
19.2.13	POWER SUPPLY SITOP PSU 100S, Identification no. 6EP1334-2BA20	1	0	1
19.2.14	DP SLAVE INTERFACE MOD, Identification no. 6ES7153-2BA02-0XB0	2	0	2
19.2.15	SIMATIC PS 307 POWER SUPPLY , Identification no. 6ES7307-1EA00-0AA0	2	0	2
19.2.16	COMMUNICATION PROCESSOR, Identification no. 6GK7343-1CX10-0XE0	1	0	1
19.2.17	SIMATIC DP, BUS CONNECTOR FOR PROFIBUS UP TO 12 MBIT/S 90 DEGREE ANGLE CABLE OUTLET, IPCD TECHNOLOGY FAST CONNECT, WITH PG SOCKET , Identification no. 6ES7972-0AB52-0XA0	3	0	3
19.2.18	BUS MODULE, Identification no. 6ES7195-7HB00-0XA0	4	0	4

19.3 Phase-II Unit-5 Bailey Controls 7000 Series Electronic Control System

19.4 Phase-II Gas Turbine Generating Unit Type 9 Brown, Boveri (BBC)

19.5 Phase-II Gas Turbine #5 Air Intake System Allen Bradley Micrologix 1400 PLC

19.6 Phase-I Demin Plant PLC System, Siemens S7-1500

Sr. No.	PLC System SIMATIC S7 Description	ON HAND	Installed	Total
19.6.1	SIMATIC HMI KP1500 COMFORT PANEL, KEY OPERATION, 15 WIDESCREEN-TFT-DISPLAY, Identification no.	0	1	1
19.6.2	SIMATIC S7-1500, CPU 1516-3 PN/DP, Identification no.	0	1	1
19.6.3	SIMATIC S7, MEMORY CARD FOR S7-1X00 CPU, 12 MBYTE, Identification no.	0	1	1
19.6.4	SIMATIC S7-1500, DIGITAL OUTPUT MODULE DQ 32 X 24VDC, Identification no.	0	5	5
19.6.5	SIMATIC S7-1500, ANALOG INPUT MODULE AI 8 X U/I/RTD/TC, 16 BITS OF RESOLUTION, Identification no.	2	4	6
19.6.6	SIMATIC S7-1500, ANALOG OUTPUT MODULE AQ 8 X U/I HS 16 BITS OF RESOLUTION, Identification no.	0	2	2
19.6.7	SIMATIC S7-1500, FRONTCONNECTOR SCREW-TYPE, 40PIN, Identification no.	0	11	11
19.6.8	SIMATIC ET 200MP. PROFINET IO-DEVICE INTERFACEMODULE IM 155-5 PN, Identification no.	0	1	1
19.6.9	SIMATIC S7-1500, DIGITAL INPUT MODULE DI32 X DC24V, 32 CHANNELS, Identification no.	2	10	12
19.6.10	SIMATIC S7-1500, FRONTCONNECTOR SCREW-TYPE, 40PIN, Identification no.	0	10	10
19.6.11	SIMATIC S7-1500, MOUNTING RAIL 482 MM, Identification no.	0	1	1
19.6.12	SIMATIC S7-1500, MOUNTING RAIL 482 MM, Identification no.	0	1	1

19.6.13	POWER SUPPLY PSU 8200	1	0	1
19.6.14	Weidmuller Power Supply	0	1	1

19.7 Phase-II Demin Plant PLC System, Siemens PLC-S7-200

19.7.1	SIMATIC HMI KP 1500, COMFORT PANEL KEY OPERATION 15" WIDESCREEN-TFT-DISPLAY, Identification no. 6AV2124-1QC02-0AX0	0	1	1
19.7.2	SIMATIC S7-300 CPU 315-2 PN/DP, CENTRAL PROCESSING UNIT WITH 384 KBYTE WORKING MEMORY, 1 INTERFACE MPI/DP 12 MBIT/S. INTERFACE ENTERNET PROFINT WITH 2 PORT SWITH, MICRO MEMORY CARD NECESSARY, Identification no. 6ES7315-2AH14-0AB0	0	1	1
19.7.3	SIMATIC S7-300, DIGITAL INPUT SM 321, OPTICALLY ISOLATED 32DI, 24 V DC, 1 X 40 PIN, Identification no. 6ES7321-1BL00-0AA0	0	4	4
19.7.4	SIMATIC S7-300, DIGITAL OUTAGE SM 322, OPTICALLY ISOLATED, 32DO, 24V DC, 0.5A, 1 X 40 PIN, SUM OF OUTPUT CURRENTS 4A/ GROUP (16A/MODULE) , Identification no. 6ES7322-1BL00-0AA0	0	2	2
19.7.5	SIMATIC S7-300, Analog input SM 331, isolated, 2 AI, Resolution 9/12/14 bits, U/I/thermocouple/resistor, alarm, diagnostics, 1x 20-pole, Removing/inserting with active backplane bus, Identification no. 6ES7331-7KF02-0AB0	0	1	1
19.7.6	DC POWER SUPPLY, ALLEN BRADLY, Identification no. 1606-XL SDNET8	0	2	2

20. Diesel Engines



- **Emergency Diesel Generator**
 - Manufacturers: LS
 - Capacity: 780 KVA
 - Rated Voltage: 415 VAC
- **Emergency Fire Pump**

20.1. Emergency Diesel Engine

No	Item/Equipment / Classification	Photo/ Drawing	Q	Description	Major Material
20.1.1	Emergency Diesel Generator		1	Manufacturer: LS Type:49.1L9A C6/4, 3 Phase 4 Pole 50Hz 1500 RPM 780KVA 0.8PF, Weight: 1820 KG	Copper/Steel
20.1.2	Synchronizing Panel		1	415V Size: 1800 X 800 X 500cm Manufacturer: BABCOCK	Copper/Steel
20.1.3	Breakers Panel		3	415V, Size: 1500 X 1300 X 500cm, 3 Breakers & bus bars	Copper/Steel
20.1.4	Unit, Rack Central, FOR A600 MICS Process 2 Desk Unit		1	SDMO Diesel Generator Set Controller Replacement Model A600 Mics P.NO.: P146000	Copper/Steel



20.2. Fire Emergency Pump

20.2.1	Fire Pump Diesel Engine	1	<p>Manufacturer: Stabilimenti Meccanica TYPE: T.I. 1316 MH 14 Injection: Direct No. Of Cylinders: 16 Bore & Stroke: 130 X 140 mm Rated Output: 327.1 kw, Max. 372 kw Rated Speed: 1495 RPM, Max. 1800 RPM Oil Pressure: 6/7 bar (Minimum: 3 Bar Hot Engine) Maximum Oil Temp.: 120 °C Water Temp. (Working): 74°C Maximum: 90°C Exhaust Gas Temp: 400/450 °C Max. Exhaust gas backpressure: 580 mm H2O</p>	Steel
20.2.2	Fire Pump (Diesel Engine Driven)	1	<p>Speed: 1485 RPM Capacity: rated 400 m³ / h, max. 600 m³ / h at 10.8 Bar Bearings: Oil Bath Lubricated. Construction Material: Body: ASTM A. 439. TP.D2 Impeller: ASTM A. 743. CF3M. Shaft: AISI 316 Seal: Packing S.S. 6</p>	Steel

21. Common Plants



- **HP/LP Steam Headers**
- **Feed & Distillate Headers**
- **Condensate Headers**

21.1 Common Plants- Mechanical Parts:

Sr. No.	Section	Item	Q	Description	Major Material
HP/LP Steam Headers					
21.1.1	H.P Steam Header Section # 1	Header Pipe Line Length	14.5 MT	NB300/12" , 12.7 mm	Carbon Steel
21.1.2	H.P Steam Header Section # 1	Header Isolating Valve, AS106	1 EACH	DN3000, PN64	Carbon Steel
21.1.3	H.P Steam to T/A No. 1	Pipe Line Length	40 MT	NB250/10" .	Carbon Steel
21.1.4	H.P Steam to T/A No. 1	Isolating valve AS 105	1 EACH	DN250, PN64	Carbon Steel
21.1.5	T/A # 1 Pass out to LP Header SECTION # 1	Pipe Line Length	25 MT	NB900/ 6.3 mm	Carbon Steel
21.1.6	T/A # 1 Pass out to LP Header SECTION # 1	Motorize Check Valve, AS1 T1	1 EACH	DN750, PN10	Carbon Steel
21.1.7	T/A # 1 Pass out to LP Header SECTION # 1	Motorize Gate Valve, AS1 T2	1 EACH	Flanged Ends	Carbon Steel
21.1.8	Pass out to LP Steam Header Section # 1:	Butterfly Valve AS117	1 EACH	DN750, PN10	Carbon Steel
21.1.9	LP Steam Header Section # 1	Header Pipe Line Length Section 1	15 MT	DN900, PN10	Carbon Steel
21.1.10	LP Steam Header Section # 1	Pipe Reducer	1 EACH	NB1000/ Sch. 5	Carbon Steel
21.1.11	LP Steam Header Section # 1	Isolating Motorized Gate Valve AS144	1EACH	Pipe Reducer 1000 x 600 x 6 mm thk.	Carbon Steel
21.1.12	HP Steam to LP Header Section 1	Isolating Gate valve, AS 107	1 EACH	DN600, PN10	Carbon Steel
21.1.13	HP Steam to LP Header Section 1	Pipe Reducer	1 EACH	Gate Valve DN250, PN64	Carbon Steel
21.1.14	HP Steam to LP Header Section 1	Isolating Gate Valve, AS109	1EACH	Pipe Reducer 250 x 150	Carbon Steel
21.1.15	HP Steam to LP Header Section 1	Check Valve, AS124	1EACH	Thickness 6 mm	Carbon Steel
21.1.16	HP Steam to LP Header Section 1	Pneumatic Control Needle Valve, AS110	1EACH	Gate Valve DN150, PN64	Carbon Steel
21.1.17	HP Steam to LP Header Section 1	Safety Valve Flanged, AS133	1 EACH	DN150, PN64	Carbon Steel
21.1.18	HP Steam to LP Header Section 1	Safety Valve Flanged, AS137 & AS138	2 EACH	DN150/600	Carbon Steel

21.1.19	HP Steam to LP Header Section 1	Isolating Gate Valve, AS125	1EACH	DN100/100, PN10	Carbon Steel
21.1.20	LP Steam Header Section 1	Pipe Reducer	1 EACH	DN250/300, PN10	Carbon Steel
21.1.21	LP Steam Header Section 1	Safety Valve AS153,AS145 & AS146	3 EACH	DN600, PN10	Carbon Steel
21.1.22	LP Steam Header Section 1	Pipe Reducer	1 EACH	Pipe Reducer 800 x 1000	Carbon Steel
21.1.23	LP Steam Header Section 1	Motorize Gate Valve, AS144	1 EACH	DN200/250, PN10	Carbon Steel
21.1.24	LP Steam Header Section 1	Pipe Reducer	1 EACH	Pipe Reducer 1000 x 600	Carbon Steel
21.1.25	H.P Steam Header Section # 2	Header Pipe Line Length	14.5 MT	NB300/12".	Carbon Steel
21.1.26	H.P Steam Header Section # 2	Header Isolating Valve, AS206	1 EACH	DN3000, PN64	Carbon Steel
21.1.27	H.P Steam to T/A No.2	Pipe Line Length	40 MT	NB250/10".	Carbon Steel
21.1.28	H.P Steam to T/A No. 2	Isolating valve AS 205	1 EACH	DN250, PN64	Carbon Steel
21.1.29	T/A # 1 Pass out to LP Header SECTION # 2	Pipe Line Length	25 MT	NB900/Sch. 20	Carbon Steel
21.1.30	T/A # 1 Pass out to LP Header SECTION # 2	Motorize Check Valve, AS2T1	1 EACH	DN750, PN10	Carbon Steel
21.1.31	T/A # 1 Pass out to LP Header SECTION # 2	Motorize Gate Valve, AS2 T2	1 EACH	DN750, PN10	Carbon Steel
21.1.32	Pass out to LP Steam Header Section # 2	Butterfly Valve AS217	1 EACH	DN900, PN10	Carbon Steel
21.1.33	HP Steam to LP Header Section 2	Isolating valve AS 207	1 EACH	DN250, PN64	Carbon Steel
21.1.34	HP Steam to LP Header Section 2	Pipe Reducer	1 EACH	Pipe Reducer 250 x 150	Carbon Steel
21.1.35	HP Steam to LP Header Section 2	Isolating Gate Valve, AS209	1EACH	DN150, PN64	Carbon Steel
21.1.36	HP Steam to LP Header Section 2	Check Valve, AS224	1EACH	DN150, PN64	Carbon Steel
21.1.37	HP Steam to LP Header Section 2	Pneumatic Control Needle Valve, AS210	1EACH	DN150/600	Carbon Steel
21.1.38	HP Steam to LP Header Section 2	Safety Valve Flanged, AS233	1 EACH	DN100/300, PN10	Carbon Steel
21.1.39	HP Steam to LP Header Section 2	Safety Valve Flanged, AS237 & AS238	2 EACH	DN250/300, PN10	Carbon Steel
21.1.40	HP Steam to LP Header Section 2	Isolating Gate Valve, AS225	1EACH	DN600, PN10	Carbon Steel
21.1.41	LP Steam Header Section 2	Check Valve AS248	1 EACH	DN800, PN10	Carbon Steel

21.1.42	LP Steam Header Section 2	Motorize Gate Valve, AS244 Pipe Reducer	1 EACH	1200DN800, PN10	Carbon Steel
21.1.43	LP Steam Header Section 2	Pipe Reducer	1 EACH	Pipe Reducer 800 x 1200	Carbon Steel
21.1.44	LP Steam Header Section 2	Safety Valve AS253,AS245 & AS246	3 EACH	DN200/250, PN10	Carbon Steel
21.1.45	LP Steam Header Section 2	LP Header Pipe	12 MT	Pipe NB1200, 6 mm	Carbon Steel
21.1.46	H.P Steam Header Section # 3	Header Pipe Line Length	14.5 MT	NB300/12".	Carbon Steel
21.1.47	H.P Steam Header Section # 3	Header Isolating Valve, AS306	1 EACH	DN3000, PN64	Carbon Steel
21.1.48	H.P Steam to T/A No. 3	Pipe Line Length	40 MT	NB250/10".	Carbon Steel
21.1.49	H.P Steam to T/A No. 3	Isolating valve AS 305	1 EACH	DN250, PN64	Carbon Steel
21.1.50	T/A # 1 Pass out to LP Header SECTION # 3	Pipe Line Length	25 MT	NB900/Sch. 20	Carbon Steel
21.1.51	T/A # 1 Pass out to LP Header SECTION # 3	Motorize Check Valve, AS3T1	1 EACH	DN750, PN10	Carbon Steel
21.1.52	T/A # 1 Pass out to LP Header SECTION # 3	Motorize Gate Valve, AS3 T2	1 EACH	DN750, PN10	Carbon Steel
21.1.53	Pass out to LP Steam Header Section # 3	Butterfly Valve AS317	1 EACH	DN900, PN10	Carbon Steel
21.1.54	LP Steam Header Section # 3	Header Pipe Line Length Section 3	12 MT	NB1200/ Sch. 5	Carbon Steel
21.1.55	LP Steam Header Section # 3	Check Valve, AS348	1 EACH	Pipe Reducer DN800 , PN10	Carbon Steel
21.1.56	LP Steam Header Section # 3	Isolating Motorized Gate Valve AS344	1EACH	DN800, PN10	Carbon Steel
21.1.57	HP Steam to LP Header Section 3	Isolating valve AS 307	1 EACH	DN250, PN64	Carbon Steel
21.1.58	HP Steam to LP Header Section 3	Pipe Reducer	1 EACH	Pipe Reducer 250 x 150	Carbon Steel
21.1.59	HP Steam to LP Header Section 3	Isolating Gate Valve, AS309	1EACH	DN150, PN64	Carbon Steel
21.1.60	HP Steam to LP Header Section 3	Check Valve, AS324	1EACH	DN150, PN64	Carbon Steel
21.1.61	HP Steam to LP Header Section 3	Pipe Reducer	1 EACH	Pipe Reducer 150 x 100	Carbon Steel
21.1.62	HP Steam to LP Header Section 3	Pneumatic Control Needle Valve, AS310	1EACH	DN150/600	Carbon Steel
21.1.63	HP Steam to LP Header Section 3	Safety Valve Flanged, AS333	1 EACH	DN100/300, PN10	Carbon Steel
21.1.64	HP Steam to LP Header Section 3	Safety Valve Flanged, AS237 & AS238	2 EACH	DN250/300, PN10	Carbon Steel

21.1.65	HP Steam to LP Header Section 3	Isolating Gate Valve, AS325	1EACH	DN600, PN10	Carbon Steel
21.1.66	LP Steam Header Section 3	Check Valve AS348	1 EACH	DN1200, PN10	Carbon Steel
21.1.67	LP Steam Header Section 3	Motorize Gate Valve, AS344	1 EACH	DN1200, PN10	Carbon Steel
21.1.68	LP Steam Header Section 3	Safety Valve AS353,AS345 & AS346	3 EACH	DN200/250, PN10	Carbon Steel
21.1.69	LP Steam Header Section 3	LP Header Pipe	12 MT	Pipe NB1200, 6 mm.	Carbon Steel
21.1.70	H.P Steam Header Section # 4	Header Pipe Line Length	14.5 MT	NB300/12".	Carbon Steel
21.1.71	H.P Steam Header Section # 4	Header Isolating Valve, AS406	1 EACH	DN3000, PN64	Carbon Steel
21.1.72	H.P Steam to T/A No. 4	Pipe Line Length	40 MT	NB250/10".	Carbon Steel
21.1.73	H.P Steam to T/A No. 4	Isolating valve AS 405	1 EACH	DN250, PN64	Carbon Steel
21.1.74	T/A # 1 Pass out to LP Header SECTION # 4	Pipe Line Length	25 MT	NB900/Sch. 20	Carbon Steel
21.1.75	T/A # 1 Pass out to LP Header SECTION # 4	Motorize Check Valve, AS4T1	1 EACH	DN750, PN10	Carbon Steel
21.1.76	T/A # 1 Pass out to LP Header SECTION # 4	Motorize Gate Valve, AS4 T2	1 EACH	DN750, PN10	Carbon Steel
21.1.77	Pass out to LP Steam Header Section # 4	Butterfly Valve AS417	1 EACH	DN900, PN10	Carbon Steel
21.1.78	LP Steam Header Section # 4	Header Pipe Line Length Section 4	12 MT	NB1200/ Sch. 5	Carbon Steel
21.1.79	LP Steam Header Section # 4	Check Valve, AS448	1 EACH	DN1200 , PN10	Carbon Steel
21.1.80	LP Steam Header Section # 4	Isolating Motorized Gate Valve AS444	1EACH	DN1200 , PN10	Carbon Steel
21.1.81	HP Steam to LP Header Section 4	Isolating valve AS 407	1 EACH	DN250, PN64	Carbon Steel
21.1.82	HP Steam to LP Header Section 4	Pipe Reducer	1 EACH	Pipe Reducer 250 x 150	Carbon Steel
21.1.83	HP Steam to LP Header Section 4	Isolating Gate Valve, AS409	1EACH	DN150, PN64	Carbon Steel
21.1.84	HP Steam to LP Header Section 4	Check Valve, AS424	1EACH	DN150, PN64	Carbon Steel
21.1.85	HP Steam to LP Header Section 4	Pipe Reducer	1 EACH	Pipe Reducer 150 x 100	Carbon Steel
21.1.86	HP Steam to LP Header Section 4	Pneumatic Control Needle Valve, AS410	1EACH	DN150/600	Carbon Steel
21.1.87	HP Steam to LP Header Section 4	Safety Valve Flanged, AS433	1 EACH	DN100/300, PN10	Carbon Steel

21.1.88	HP Steam to LP Header Section 4	Safety Valve Flanged, AS437 & AS438	2 EACH	DN250/300, PN10	Carbon Steel
21.1.89	HP Steam to LP Header Section 4	Isolating Gate Valve, AS425	1EACH	DN600, PN10	Carbon Steel
21.1.90	LP Steam Header Section 4	Check Valve AS448	1 EACH	DN800, PN10	Carbon Steel
21.1.91	LP Steam Header Section 4	Motorize Gate Valve, AS444Pipe Reducer	1 EACH	1200DN800, PN10	Carbon Steel
21.1.92	LP Steam Header Section 3	Safety Valve AS353,AS345 & AS346	3 EACH	DN200/250, PN10	Carbon Steel
21.1.93	LP Steam Header Section 4	Pipe Reducer	1 EACH	Pipe Reducer 800 x 1200	Carbon Steel
21.1.94	LP Steam Header Section 4	LP Header Pipe	12 MT	Pipe NB1200, 6 mm	Carbon Steel

Feed & Distillate Headers

21.1.95	Distillate Suction Header Unit - 1	Header Pipe Line Length	10 MT	NB300,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.96	Distillate Suction Header Unit - 1	Header Isolating Gate Valve, AF103 & 203	2 Each	DN300, PN10	Carbon Steel
21.1.97	Distillate Suction Header Unit - 1	Feed Water Tank No. FWT-1	1 Each	Ø 3.2 x 10 M	Carbon Steel
21.1.98	Distillate Suction Header Unit - 1	Feed Tank Isolating Valve AF 101 & 102	2 Each	DN250, PN10	Carbon Steel
21.1.99	Distillate Suction Header Unit - 1	Feed Water From FWT-1 to Distillate Header	28 MT	NB250,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.100	Distillate Suction Header Unit - 1	Turbo-feed Pump # 1 Suction Gate Valve, AF104	1 Each	DN250, PN10	Carbon Steel
21.1.101	Distillate Suction Header Unit - 1	Pipe Line to TFP # 1	10 MT	NB250,Sch 20s,Thick 6.3 mm	Carbon Steel
21.1.102	Distillate Suction Header Unit - 1	Electric feed Pump # A, Suction Gate Valve, AF304	1 Each	DN250, PN10	Carbon Steel
21.1.103	Distillate Suction Header Unit - 1	Pipe Line to EFP # A	10 MT	NB250,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.104	Feed Delivery Header Unit - 1	Header Pipe Line Length	10 MT	NB175,Sch 20s, Thick 6 mm	Carbon Steel
21.1.105	Feed Delivery Header Unit - 1	Header Isolating Gate Valve, AF110 & 210	2 Each	DN200, PN100	Carbon Steel
21.1.106	Feed Delivery Header Unit - 1	Turbo-feed Pump # 1 Delivery Gate Valve, AF108	1 Each	DN250, PN100	Carbon Steel
21.1.107	Feed Delivery Header Unit - 1	Turbo-feed Pump # 1 Check Valve, AF106	1 Each	DN125, PN100	Carbon Steel
21.1.108	Feed Delivery Header Unit - 1	Pipe Line to TFP # 1	13 MT	NB175,Sch 20s, Thick 6.3 mm	Carbon Steel

21.1.109	Feed Delivery Header Unit - 1	Electric feed Pump # A Delivery Gate Valve, AF308	1 Each	DN250, PN100	Carbon Steel
21.1.110	Feed Delivery Header Unit - 1	Turbo-feed Pump # 1 Check Valve, AF306	1 Each	DN125, PN100	Carbon Steel
21.1.111	Feed Delivery Header Unit - 1	Pipe Line to EFP # A	10 MT	NB175, Sch20s, Thk 6.3 mm	Carbon Steel
21.1.112	Distillate Suction Header Unit - 2	Header Pipe Line Length	10 MT	NB300,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.113	Distillate Suction Header Unit - 2	Header Isolating Gate Valve, AF246	1 Each	DN300, PN10	Carbon Steel
21.1.114	Distillate Suction Header Unit - 2	Feed Water Tank No. FWT-2	1 Each	Ø 3.2 x 10 M	Carbon Steel
21.1.115	Distillate Suction Header Unit - 2	Feed Tank Isolating Valve AF 201 & 202	2 Each	DN250, PN10	Carbon Steel
21.1.116	Distillate Suction Header Unit - 2	Feed Water From FWT-2 to Distillate Header	28 MT	NB250,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.117	Distillate Suction Header Unit - 2	Electric feed Pump # 2 Suction Gate Valve, AF204	1 Each	DN250, PN10	Carbon Steel
21.1.118	Distillate Suction Header Unit - 2	EFP # 2 Suction Line	10 MT	NB250,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.119	Feed Delivery Header Unit – 2	Header Pipe Line Length	10 MT	NB200,Sch 20s, Thk 6 mm	Carbon Steel
21.1.120	Feed Delivery Header Unit – 2	Iso. Gate Valve, AF110 & 210	2 Each	DN200, PN100	Carbon Steel
21.1.121	Feed Delivery Header Unit – 2	Electric feed Pump # 2 Delivery Gate Valve, AF208	1 Each	DN175, PN100	Carbon Steel
21.1.122	Feed Delivery Header Unit – 2	Electric feed Pump # 2 Check Valve, AF206	1 Each	DN125, PN100	Carbon Steel
21.1.123	Feed Delivery Header Unit - 2	EFP # 2 Discharge Line	10 MT	NB175,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.124	Feed Delivery Header Unit – 2	Electric feed Pump # 2 Check Valve, AF206	1 Each	DN125, PN100	Carbon Steel
21.1.125	Feed Delivery Header Unit - 2	EFP # 2 Discharge Line	10 MT	NB175,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.126	Distillate Suction Header Unit – 3	Header Pipe Line Length	10 MT	NB300,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.127	Distillate Suction Header Unit – 3	Feed Water Tank No. FWT-3	1 Each	Ø 3.2 x 10 M	Carbon Steel
21.1.128	Distillate Suction Header Unit – 3	Feed Tank Isolating Valve AF 301 & 302	2 Each	DN250, PN10	Carbon Steel
21.1.129	Distillate Suction Header Unit – 3	Feed Water From FWT-3 to Distillate Header	28 MT	NB250,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.130	Distillate Suction Header Unit – 3	Turbo feed Pump # 3 Suction Gate Valve, AF304	1 Each	DN250, PN10	Carbon Steel

21.1.131	Distillate Suction Header Unit – 3	TFP # 3 Suction Line	10 MT	NB250,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.132	Feed Delivery Header Unit - 3	Header Pipe Line Length	10 MT	NB175,Sch 20s, Thick 6 mm	Carbon Steel
21.1.133	Feed Delivery Header Unit - 3	TFP # 3 Discharge Line	10 MT	NB175,Sch 40s, Thick 9.27 mm	Carbon Steel
21.1.134	Feed Delivery Header Unit - 3	Turbo feed Pump # 3 Delivery Gate Valve, AF408	1 Each	DN250, PN100	Carbon Steel
21.1.135	Feed Delivery Header Unit - 3	Turbo-feed Pump # 3 Check Valve, AF306	1 Each	DN125, PN100	Carbon Steel
21.1.136	Feed Delivery Header Unit - 3	Pipe Line to TFP # 3	10 MT	NB175,Sch 40s, Thick 9.27 mm	Carbon Steel
21.1.137	Distillate Suction Header Unit 3 & 4	Header Pipe Line Length	10 MT	NB300,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.138	Distillate Suction Header Unit 3 & 4	Header Isolating Gate Valve, AF403 & 303	2 Each	DN300, PN10	Carbon Steel
21.1.139	Distillate Suction Header Unit 3 & 4	Feed Water Tank No. FWT-4	1 Each	Ø 3.2 x 10 M	Carbon Steel
21.1.140	Distillate Suction Header Unit 3 & 4	Feed Tank Isolating Valve AF 401 & 402	2 Each	DN250, PN10	Carbon Steel
21.1.141	Distillate Suction Header Unit 3 & 4	Feed Line From FWT-4 to Distillate Header	28 MT	NB250,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.142	Distillate Suction Header Unit 3 & 4	Turbo-feed Pump # 4 Suction Gate Valve, AF504	1 Each	DN250, PN10	Carbon Steel
21.1.143	Distillate Suction Header Unit 3 & 4	Suction Line to TFP # 4	10 MT	NB250,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.144	Distillate Suction Header Unit 3 & 4	Turbo-feed Pump # B Suction Gate Valve, AF604	1 Each	DN250, PN10	Carbon Steel
21.1.145	Distillate Suction Header Unit 3 & 4	Suction Line to TFP # B	10 MT	NB250,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.146	Distillate Delivery Header Unit 3 & 4	Discharge Header Length	10 MT	NB200,Sch 40s, Thick 9.27 mm	Carbon Steel
21.1.147	Distillate Delivery Header Unit 3 & 4	Header Isolating Gate Valve, AF310 & 410	2 Each	DN200, PN100	Carbon Steel
21.1.148	Distillate Delivery Header Unit 3 & 4	Turbo-feed Pump # B Delivery Gate Valve, AF608	1 Each	DN250, PN100	Carbon Steel
21.1.149	Distillate Delivery Header Unit 3 & 4	Turbo-feed Pump # B Check Valve, AF606	1 Each	DN125, PN100	Carbon Steel
21.1.150	Distillate Delivery Header Unit 3 & 4	Pipe Line to TFP # B	10 MT	NB175,Sch 40s, Thick 9.27 mm	Carbon Steel
21.1.151	Feed Water Tanks	Feed water Tank FWT-1,2,3 & 4	4 Each	Ø3.2 M x 10 M	Carbon Steel
21.1.152	Reserve Feed Water Tanks	Reserve Feed Water Tank FWT-1,2,3 & 4	4 Each	L: 5.2, W:5, H:3 Meters	Carbon Steel

Condensate Headers

21.1.153	Condensate Header Section # 1 & 2	Electric feed Pump # 2 Check Valve, AF206	1 Each	DN125, PN100	Carbon Steel
21.1.154	Condensate Header Section # 1 & 2	EFP # 2 Discharge Line	10 MT	NB175,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.155	Condensate Header Section # 1 & 2	Header Pipe Line Length	10 MT	NB300,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.156	Condensate Header Section # 1 & 2	Feed Water Tank No. FWT-3	1 Each	Ø 3.2 x 10 M	Carbon Steel
21.1.157	Condensate Header Section # 1 & 2	Feed Tank Isolating Valve AF 301 & 302	2 Each	DN250, PN10	Carbon Steel
21.1.158	Condensate Header Section # 1 & 2	Feed Water From FWT-3 to Distillate Header	28 MT	NB250,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.159	Condensate Header Section # 1 & 2	Turbo feed Pump # 3 Suction Gate Valve, AF304	1 Each	DN250, PN10	Carbon Steel
21.1.160	Condensate Header Section # 1 & 2	TFP # 3 Suction Line	10 MT	NB250,Sch 20s, Thick 6.3 mm	Carbon Steel
21.1.161	Condensate Header Section # 1 & 2	Header Pipe Line Length	10 MT	NB175,Sch 20s, Thick 6 mm	Carbon Steel

Walk-way Bridges

21.1.162	The Bridge between Main Building & Steam Turbine Hall	1			Carbon Steel
21.1.163	the Bridge between Steam Turbine Hall & Distiller 1A/1B	1			Carbon Steel

21.2 Common Plants- Electrical Parts:

HP/LP Steam Headers

No	Item/Equipment / Classification	Q	Description	Major Material
21.2.1	T/A LP Steam to Header motorize Actuators	4	Frame size: 80, 415V, 0.75 KW, 33 RPM, Total weight: ≈ 45 Kg	Copper/Steel
21.2.2	LP Header section motorize Actuators	3	Frame size: , 415V, 1.7 KW, 36 RPM, Total weight: ≈ 75 Kg	Copper/Steel
21.2.3	LP Steam to Distiller motorize Actuators	5	Frame size: , 415V, 1.5 KW, 2800 RPM, Total weight: 75 Kg	Copper/Steel

21.3 Common Plants- Instrumentation Parts:

Service Sea Water System

21.3.1	Pressure Gauge	9	NUOVA FIMA MP2	Stainless Steel
21.3.2	Pressure Switch	1	DELTA	Aluminum Alloy
21.3.3	Temperature Gauge	4	Wika en-13190	Stainless Steel
21.3.4	Priming System	4	Vatec-Meschinenbau Germany-Type AELE45W	Stainless Steel

Bearing Cooling Water System

21.3.5	Pressure Gauge	7	NUOVA FIMA MP2	Stainless Steel
21.3.6	Pressure Switch	2	DELTA	Aluminum Alloy
21.3.7	Temperature Switch	4	SECUTHERM BIT.Pat 1551956 ,Spannung bis 380v	Stainless Steel
21.3.8	Level Transmitter	3	ASK800, -400 +400mbar	Stainless Steel
21.3.9	Level Indicator	3	COLIMA S.R.L, VISCO-54 L= 750. DRG: 50- 1070	Stainless Steel

Compressed Air System

21.3.10	Pressure Gauge	4	NUOVA FIMA MP2	Stainless Steel
21.3.11	Pressure Transmitter	1	ABB, ASD800, 0 - +16 Bar	Aluminum Alloy

HP Live Steam Header

21.3.12	Pressure Gauge	4	NUOVA FIMA MP2	Aluminum Alloy
21.3.13	Pressure Transmitter	4	ABB, ASD800, -1 - +100 Bar	Aluminum Alloy

R.F.W. System

21.3.15	Level Transmitter	2	ABB, ASK800, -400 - +400 mBar	Aluminum Alloy
21.3.16	Level Transmitter	2	INDICATOR, ELECTRICAL CODE: 8200 001 CG PM NC SCALE: 0.15 TO 13.5 MTR FOR LEVEL TRANSMITTER OF BREAK TANK LEVEL MFR: K.D.G INSTRUMENTS LTD, UK	Stainless Steel
21.3.17	Level Indicator	2	COLIMA S.R.L, VISCO-54 L= 750. DRG: 50-1070	Stainless Steel
21.3.18	Pressure Gauge	2	NUOVA FIMA MP2	Stainless Steel

Water Integrator

21.3.20	Integrator	2	ELSTER, PR7 H4000	Aluminum Alloy
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HP/LP Steam Reducing Station

21.3.21	Control Valve	4	BLAKWBOROUGH, BV992/A21B, Size: 6"	Cast Steel
21.3.22	Control Valve	4	BLAKWBOROUGH, BV990/A20 EGB, Size: 1"	Cast Steel
21.3.23	Pressure Transmitter	8	ASD800, 0 - +16 Bar	Aluminum Alloy
21.3.24	Pressure Gauge	8	NUOVA FIMA MP2	Stainless Steel
21.3.25	Temperature Gauge	4	Wika en-13190	Stainless Steel
21.3.26	Instrument Cables	50m	42 Cables x 4 Cores	Cooper
21.3.27	Instrument Cables	100m	3 Cables x 96 Cores	Cooper

HP Dosing System

21.3.28	Pressure Gauge	4	NUOVA FIMA MP2	Stainless Steel
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LP Dosing System

21.3.29	Control Valve	4	DOSEURE SRL, COMPLETE DOSING WITH MOTOR TYPE: A 125N-30/C-19E	Aluminum Alloy
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21.3.30	Flow Transmitter	4	KROHNE, NL-3313 LC	Aluminum Alloy
21.3.31	Level Switch	2	COLIMA S.R.L, TYPE SPIN 1.CL DRG: 20-1008	Stainless Steel
21.3.32	Pressure Gauges	4	NUOVA FIMA MP2	Stainless Steel
21.3.33	Level Indicator	2	COLIMA S.R.L, VISCO-54 L= 750. DRG: 50-1070	Stainless Steel
21.3.34	Instrument Tube	340m	Stainless steel, 316L,Type: Seamless, S.S/10mm	Stainless Steel
21.3.35	Instrument Tube	80m	Stainless steel, 316L,Type: Seamless, S.S/12mm	Stainless Steel

22.66 KV Switch House & Transmission



23. Sitra Local Substation



24. Station Buildings



- **60 Buildings in the Station**

Sr. No.	Location	Length	Width	Height	Remarks
22.1.	Mechanical Work Shop #2	24m	24m	11m	Equipped with overhead crane
22.2.	Mechanical Work Shop #1	27m	27m	11m	Equipped with overhead crane
22.3.	Electrical Workshop	38m	15.5m	8 m	
22.4.	Instrument Workshop #1	14m	8m	4m	Equipped with overhead crane
22.5.	Instrument Work Shop #2	24m	8m	3.5m	Equipped with overhead crane
22.6.	Mechanical store #1	28m	16m	6m	
22.7.	Mechanical store #2	22m	10m	7m	
22.8.	Electrical Store	15m	14m	5m	
22.9.	SSG Work Shop	14m	8m	4.5m	
22.10.	Laboratory	22m	22m	4m	
22.11.	Laboratory Store #1	22m	16m	10m	
22.12.	Laboratory Store #2	24m	22m	10m	
22.13.	Welding workshop	30m	22m	8m	
22.14.	Admin Section Building	33m	8m	4.5m	
22.15.	Administration Building	27m	15m	6.5m	
22.16.	General toilet	10m	5.5m	3.5m	
22.17.	SSG office	15m	5m	3.5m	
22.18.	Planning Section Building	32m	10.5m	4m	
22.19.	Distiller 1A/1B 415V room	7.5m	5.5m	5.5m	
22.20.	Dist.2. 415V room	7.5m	5.5m	5.5m	
22.21.	Dist.3 415V room	7.5m	5.5m	5.5m	
22.22.	Dist.4 415V room	7.5m	5.5m	5.5m	
22.23.	CSD Sub-Store	43m	26m	8.5m	
22.24.	Paint Store	5m	5m	3m	
22.25.	Emergency Fire Pump house	8m	6m	4m	
22.26.	Hypo-chlorination Plant PH II	21m	9m	4.5m	
22.27.	Central Control Room U#5	36m	19m	6.5m	
22.28.	GT#5 11KV Switch House	7m	5m	4m	
22.29.	Hypo-chlorination Plant PH I&III	19m	16m	10m	
22.30.	Unit – 5 3.3Kv Room	14m	8m	7m	
22.31.	GT#5 Turbine hall	25m	14m	14m	
22.32.	U#5 Demin Plant	12m	12m	6m	

22.33.	Turbine Hall	45m	74m	19m
22.34.	66 KV Switch House	61m	24m	9m
22.35	Sitra Local Substation			
22.36.	Phase-I Demin Plant	13m	10m	6m
22.37.	Canteen	17.4m	17.4m	5.3m
22.38.	Distiller 1A Columns (X18)	1.2m	1.0m	6.5m
22.39.	Distiller 1B Columns (X14)	1.2m	1.0m	6.5m
22.40.	Distiller 1A, 1B Operator room	3.9m	3.9m	3.6m
22.41.	Distiller 2 Columns (X25)	0.9m	0.9m	6.5m
22.42.	Distiller 2 Intake Pit	3.7m	3.6m	1.25m
22.43.	Distiller 2 Pipe Support (X2)	1.2m	0.52m	1.25m
22.44.	Distiller 2 Acid Tank Support	2.3m	0.45m	0.78m
22.45.	Distiller 2 Brine Pipe Support (X2)	2.7m	0.8m	6.5m
22.46.	Distiller 3 Columns (X25)	0.9m	0.9m	6.5m
22.47.	Distiller 3 Intake Pit	3.7m	3.6m	1.25m
22.48.	Distiller 3 Pipe Support (X2)	1.2m	0.52m	1.25m
22.49.	Distiller 3 Acid Tank Support	2.3m	0.45m	0.78m
22.50.	Distiller 3 Brine Pipe Support (X2)	2.7m	0.8m	6.5m
22.51.	Distiller 4 Columns (X25)	0.9m	0.9m	6.5m
22.52.	Distiller 4 Intake Pit	3.7m	3.6m	1.25m
22.53.	Distiller 4 Pipe Support (X2)	1.2m	0.52m	1.25m
22.54.	Distiller 4 Acid Tank Support	2.3m	0.45m	0.78m
22.55.	Distiller 4 Brine Pipe Support (X2)	2.7m	0.8m	6.5m
22.56.	Distillers 2,3,4 Crane Operator room	5.5m	5.5m	4.0m
22.57.	Distillers 2,3,4 Operator Locker Room	3.9m	3.9m	3.6m
22.58.	Distillers 2,3,4 Sea Water P/Ps Foundations (X3)	3.95m	2.72m	1.36m
22.59.	Unit-5 Cabin	4.0m	4.0m	3.7m
22.60.	Mechanical Workshop #2 Toilet	6.0m	4.0m	3.7m
22.61.	ISSD Building (Close to GRS)			