SWITCHBOARD 'A' DESIGN SPECIFICATIONS	
Rated Operation Voltage (Ue)	415/240 Vac
Rated Voltage	690V
Rated Phases (Ø)	3Ph + N + E
Rated Operation Frequency (Hz)	50Hz
Rated Insulation Level (Ui)	2.5kV/1 Sec.
Rated Short Circuit Level (Icu)	65kA
Rated Current of Assembly (I)	3200A
Busbars Rating (I)	3000A
Main Incomer Breaker Assemble Type	ACB (Motorized & Draw-Out)
Outgoers Breaker Assembly Type	Refer to the drawing
Panel Type	Metallic Electrofolded
Mounting Details	Free Standing, Floor Mounted
Design Temperature	30° C
Cond.Metal to Term.For Wiring	Form 4b
Design Altitude	> 2000M
Panel Colour	.....
Finishes	Rough Texture Gloss
Panel Access	Front
Incoming Cables Entry	Top
Outgoing Cables Entry	Top
Degree of Protection	IP54
Earth Bar Cross Section	.....SQ mm
Fire Emergency Shunt/Trip Switch	6 NR Circuit Breakers
Factory Acceptance Testing Schedule	Refer to the attached Schedule
Remote Control/BMS Interface	Refer to the drawing and BMS Schedule

From Transformer No. 1 (Refer Drawings EP_3. and EP_4.1 for details)

34No 630mm² XLPE/PVC SC CU Cables

3200A TPN ISOLATOR Q1 — Q2 — 1.6MVA AVR — Q3 — BY-PASS LINE

1.6MVA, 240/415V, 3ph, 4 WIRES AUTOMATIC VOLTAGE REGULATOR NO. 1 COMPLETE WITH 3200A MANUAL BY-PASS SYSTEM

34No 630mm² XLPE/PVC SC CU Cables

From Transformer No. 2 (Refer Drawings EP_3. and EP_4.1 for details)

34No 630mm² XLPE/PVC SC CU Cables

3200A TPN ISOLATOR Q1 — Q2 — 1.6MVA AVR — Q3 — BY-PASS LINE

1.6MVA, 240/415V, 3ph, 4 WIRES AUTOMATIC VOLTAGE REGULATOR NO. 2 COMPLETE WITH 3200A MANUAL BY-PASS SYSTEM

34No 630mm² XLPE/PVC SC CU Cables

34No 630mm² XLPE/PVC SC CU Cables

MAIN L.V. SWICTHBOARD 'A'. Located at Main Power Centre 'A', L.V. Room (Refer Drawing EP_3. for details)

3200A, 4P BUSBARS

- 3200A, 4P ACB (MOTORIZED & DRAW-OUT TYPE) BUS COUPLER BREAKER WITH MECH. INTERLOCK KEY — Q7
- 3200A, 4P ACB (MOTORIZED & DRAW-OUT TYPE) — Q4
- 3200A, 4P ACB (MOTORIZED & DRAW-OUT TYPE) — Q5
- 3200A, 4P ACB (MOTORIZED & DRAW-OUT TYPE) — Q6
- 1600A, TP ACB (MOTORIZED & DRAW-OUT TYPE) — Q8
- 1600A, TP ACB (MOTORIZED & DRAW-OUT TYPE) — Q9

CONTACTORS — 5NO+5NC — L.V. ICTs — To BMS Control Panel — BUSBAR SECTION BUSBAR CONNECTION BANK — 3200A, 4P BUSBARS

Control Signals to extended to BMS Control Panel evds Emergency Stop Switch to be extended at Main Door (See BMS interface wiring for details)

Electronic Control and Shunt trip coils and manual/ motorized operation

1250A, TP ACB (MOTORIZED & DRAW-OUT TYPE)	8No 400mm² XLPE/PVC SC CU Cables — To Main L.V. East Wing Sub-Switchboard 'A1', Essential Section (Refer Drawings EP_3. and EP_4.3 for details)
1250A, TP ACB (MOTORIZED & DRAW-OUT TYPE)	8No 400mm² XLPE/PVC SC CU Cables — To Main L.V. West Wing Sub-Switchboard 'A2', Non - Essential Section (Refer Drawings EP_3. and EP_4.4 for details)
400A, TP MCCB (MOTORIZED & DRAW-OUT TYPE)	5No 400mm² XLPE/PVC SC CU Cables — To Main L.V. University Sub-Switchboard 'U', (Refer Drawings EP_3. and EP_4.5 for details)
150A, TP MCCB (MOTORIZED & DRAW-OUT TYPE)	1No 70mm² XLPE/SWA/PVC 4C CU Cable — TO TAC MACHINE
150A, TP MCCB (MOTORIZED & DRAW-OUT TYPE)	1No 70mm² XLPE/SWA/PVC 4C CU Cable — TO MRI MACHINE
400A, TP MCCB (MOTORIZED & DRAW-OUT TYPE)	5No 240mm² XLPE/PVC SC CU Cables — TO HUMIDIFIERS SET "2" (Refer Drawings EP_3. and EP_4.7 for details)
700A, TP ACB ADJ. (MOTORIZED & DRAW-OUT TYPE)	8No 300mm² XLPE/PVC SC CU Cables — TO CHILLER "2"
200A, TP MCCB	SPARE
200A, TP MCCB	SPARE
200A, TP MCCB	ALLOW FOR 2NO. SPACES ONLY OF 200A. TP MCCB
200A, TP MCCB	ALLOW FOR 2NO. SPACES ONLY OF 100A. TP MCCB
700A, TP ACB ADJ. (MOTORIZED & DRAW-OUT TYPE)	8No 300mm² XLPE/PVC SC CU Cables — TO CHILLER "1"
150A, TP MCCB (MOTORIZED & DRAW-OUT TYPE)	1No 70mm² XLPE/SWA/PVC 4C CU Cable — TO FIRE FIGHTING SYSTEM
150A, TP MCCB (MOTORIZED & DRAW-OUT TYPE)	1No 70mm² XLPE/SWA/PVC 4C CU Cable — TO MEDICAL GASES (Refer Drawings EP_3. and EP_4.8 for details)
125A, TP MCCB (MOTORIZED & DRAW-OUT TYPE)	1No 50mm² XLPE/SWA/PVC 4C CU Cable — TO WATER TREATMENT SET (Refer Drawings EP_3. and EP_4.9 for details)
1250A, TP ACB (MOTORIZED & DRAW-OUT TYPE)	8No 400mm² XLPE/PVC SC CU Cables — To Main L.V. East Wing Sub-Switchboard 'A1', Non - Essential Section (Refer Drawings EP_3. and EP_4.3 for details)
1250A, TP ACB (MOTORIZED & DRAW-OUT TYPE)	8No 400mm² XLPE/PVC SC CU Cables — To Main L.V. West Wing Sub-Switchboard 'A2', Non - Essential Section (Refer Drawings EP_3. and EP_4.4 for details)

STAND-BY POWER GENERATOR NO. 1 (Capacity1.3MVA,415, 3ph, 4wires) — **8No 630mm² XLPE/PVC SC CU Cables**

STAND-BY POWER GENERATOR NO. 3 (Capacity1.3MVA,415, 3ph, 4wires) — **8No 630mm² XLPE/PVC SC CU Cables**

3200A, 4P ACB (MOTORIZED & DRAW-OUT TYPE) — To BMS Control Panel — 3200A, 4P BUSBARS

34No 630mm² XLPE/PVC SC CU Cables

34No 630mm² XLPE/PVC SC CU Cables

GENERATORS' CONTROL PANEL '3' (Located at Main Power Centre 'A', Generators' Room (Refer Drawing EP_3. for details)

PROPOSED MAIN SWITCH BOARD "A" SINGLE LINE WIRING DIAGRAM

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS (MM) UNLESS OTHERWISE SPECIFIED.
2. ALL BUSBARS AND CABLES IN THE SWITCHBOARD SHALL BE COPPER.
3. ALL MAIN BUSBARS MUST BE THE SAME SIZE INCLUDING THE NEUTRAL BUSBAR.
4. ALL BUSBARS MUST BE ADEQUATELY BRACED.
5. INTERCONNECTIONS BETWEEN BUSBAR DROPPERS AND DEVICES SHALL COMPRISE COPPER BARS. CABLES SHALL NOT BE PERMITTED.
6. FLASH TESTS SHALL BE CARRIED OUT AT 2.5kV BEFORE AND AFTER "MEGGERING" IN THE PRESENCE OF THE ENGINEER.
7. ALL OUTGOING BREAKERS MUST BE EQUIPPED WITH LOCKING MECHANISM FOR SAFETY DURING MAINTENANCE.
8. CURRENT TRANSFORMERS SHALL BE FIRMLY FIXED SQUARE TO BUSBARS FOR ACCURATE READINGS.
9. FIXING OF CABLES TO BUSBARS SHALL BE BY HIGH TENSILE 8.8 GRADE MILD STEEL BOLTS AND NUTS.
10. PANELS SHALL BE FIXED TO THE SWITCHBOARD FRAME BY METRIC HEX-HEAD MACHINE SCREWS OR HIGH TENSILE 8.8 GRADE MILD STEEL BOLTS AND NUTS.
11. BUSBARS SHALL BE FIXED TO AND SUPPORTED ON RECOMMENDED INSULATORS ONLY. BAKELITE SUPPORTS SHALL NOT BE ACCEPTED UNDER ANY CIRCUMSTANCES.
12. ALL TERMINALS AND BUSBARS SHALL BE ADEQUATELY SHROUDED TO AVOID IMMEDIATE ACCESS TO LIVE PARTS.
13. THE SWITCHBOARD SHALL INCORPORATE WARNING LABELS AS APPROPRIATE TO EXPOSURE OF LIVE PARTS.
14. THE SWITCHBOARD SHALL BE SECTIONALIZED TO PROVIDE ELECTRICAL, PHYSICAL AND FIRE SEGREGATION BETWEEN SECTIONS IN ACCORDANCE WITH BS AND IEC 61439-1 AND SHALL BE FORM TYPE 4B. THE DEGREE OF PROTECTION AGAINST INGRESS SHALL BE IP42.
15. COMPARTMENT PROTECTION AGAINST DIRECT CONTACT TO LIVE PARTS SHALL BE IP 54 WITH DOORS AND GASKET KIT.
16. THE SWITCHBOARD SHALL BE CAPABLE OF EXTENSION.
17. THE SWITCHBOARD SHALL BE TYPE TESTED ASSEMBLIES (TTA) IN COMPLIANCE WITH STANDARD IEC 61439 -1 AND COMPLY WITH KENYA BUREAU OF STANDARD KS IEC - 61439.
18. THE SWITCHBOARD SHALL BE DESIGNED TO WITHSTAND A SHORT CIRCUIT LEVEL OF ... kA.
19. POWER AND CONTROL CIRCUITS SHALL BE SEPARATE AND COMPLETELY ISOLATED AND AUXILIARY CIRCUITS SHALL BE OF EXTRA-LOW VOLTAGE TYPE.
20. THE SWITCHBOARD AND ALL ITS COMPONENTS SHALL BE SUITABLY TROPICALIZED TO OPERATE SATISFACTORILY IN THE TROPICS AND MORE SPECIFICALLY AT THE ALTITUDE AND WEATHER CONDITIONS PREVAILING AT THE SEA LEVEL COASTAL SALINE ATMOSPHERE.

[redacted]

CLIENT

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DESIGN STAGE 3 Draft Final Design	DISCIPLINE ELECTRICAL
DRAWING NAME PROPOSED MAIN L.V. SWITCH BOARD "A" SINGLE LINE WIRING DIAGRAM LAYOUT	
DRAWN BY: WKM	CHECKED BY: GMN
ISSUE DATE: 2017 January,13th	SCALE: N.T.S., A1
REVISION: 3	DRAWING No.: 004.2
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