

**NOTES :**

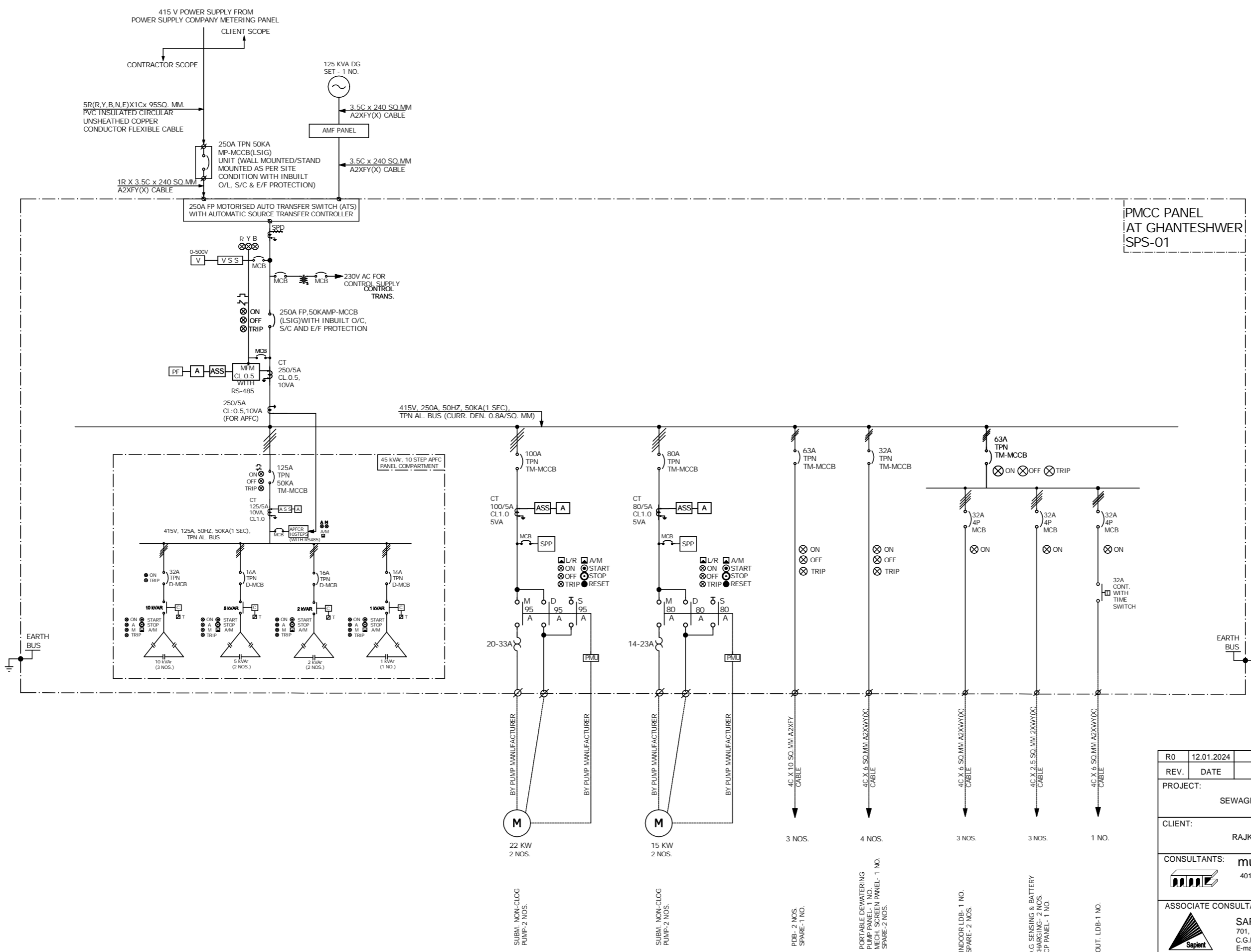
1. DESIGN TEMP. : 50° C MAX. 2° C MIN., REL. HUMIDITY : 95% MAX. 15% MIN. DEGREE OF PROTECTION: IP-52 MIN.
2. THE LT (PCC/PMCC/MCC) PANELS SHALL BE METAL ENCLOSED; EXTENSIBLE ON BOTH SIDES, FLOOR MOUNTING; FREE STANDING; TOTALLY ENCLOSED; COMPARTMENTALISED, DUST, DAMP & VERMIN PROOF TYPE. EACH SECTION SHOULD HAVE SIDE SHEET ON BOTH SIDE. IT SHALL BE FIXED TYPE IN SINGLE/DOUBLE FRONT EXECUTION. AIR CIRCUIT BREAKER, SOFT STARTER & VFD PANELS SHALL BE IN SINGLE FRONT EXECUTION ONLY.
3. THE PMCC/MCC SHALL BE FABRICATED OUT OF MIN. 14 SWG (2 MM THICK) CRCA SHEET FOR BODY, MOUNTING PLATE, DOORS & PARTITION. GLAND PLATE SHALL BE OF 3 MM THICK CRCA SHEET.
4. OVERALL HEIGHT OF PANEL WITH BASE FRAME SHALL NOT EXCEED 2300 MM (FOR SOFT STARTER / VFD PANEL MAX. 2500 MM) AND WITH BOTTOM CABLE ENTRY.
5. THE PAINTING SHALL BE AFTER 7 TANK PRE TREATMENT PROCESS AND PAINT SHALL BE POWDER COATED WITH RAL 7035 FOR INDOOR AND OUTSIDE PORTION. MOUNTING PLATE SHALL BE WITH GLOSSY WHITE COLOUR.
6. THE PANEL BASE FRAME SHALL BE OF MIN. ISMC 100 X50X 5 AND SHALL BE PAINTED BLACK.
7. BUS BARS SHALL BE OF EC GRADE ALUMINIUM DESIGNED FOR MAX. 85° C TEMP. i.e. 35° C TEMP. RISE OVER 50° C DESIGN TEMP. CURRENT DENSITY : ISQ/MM = 0.8A. BUSBARS SHOULD RUN THROUGHOUT THE LENGTH OF THE PANEL WITH CLEARANCE OF 100MM FROM THE SIDES. NEUTRAL BUSBAR SHALL BE RATED FOR 50% OF PHASE BUSBAR. MINIMUM HEIGHT/WIDTH OF BUSBAR ALLEY SHALL BE 300MM OR HIGHER.
8. MAIN, VERTICAL, AUXILIARY, POWER FEEDER & STARTER'S BUSBARS/WIRES SIZE SHALL BE AS PER RESPECTIVE FEEDER RATING WITH CURRENT DENSITY AS MENTIONED ABOVE.
9. ONLY ZINC PASSIVATED OR CADMIUM PLATED HIGH TENSILE STEEL BOLTS, NUTS & SPRING & FLAT WASHERS SHALL BE USED FOR BUSBAR JOINTS AND SUPPORTS.
10. FOR ALL PMCC PANELS INCOMING ACB SHALL BE EDO FP ACB OR 4P MCCB AS SPECIFIED IN SLD. INCOMER BREAKER (ACB/MCCB) SHALL BE WITH MICROPROCESSOR BASED PROTECTION RELEASES FOR OVER CURRENT, SHORT CIRCUIT, INBUILT EARTH FAULT WITH TIME DELAY. ACB SHALL BE PROVIDED WITH INBUILT COMMUNICATION RS-485 MODBUS WITH DISPLAY METERING (WITH ENERGY FOR INCOMER) & PROTECTION FOR CONTROL & MONITORING.
11. ELECTRICAL & MECHANICAL INTERLOCK SHALL BE PROVIDED BETWEEN THE TWO GRID INCOMER BREAKERS AND BUSCOUPLER SO THAT ONLY TWO BREAKER IS ON AT A TIME. ALSO SUITABLE ELECTRICAL INTERLOCK SHALL BE PROVIDED BETWEEN GRID INCOMERS AND D.G. SET INCOMER FOR VARIOUS OPERATING CONDITIONS (WHERE DG SET IS APPLICABLE).
12. SURGE PROTECTION DEVICE, 3P + N, TYPE 2 SHALL BE PROVIDED FOR THE INCOMERS.
13. CONSTANT VOLTAGE TRANSFORMER/ CONTROL TRANSFORMER OF MINIMUM RATING 1.5 KVA OR HIGHER WITH TAPPING OF +/-5% IN STEPS OF 2.5%. FOR EACH BUS WITH CONTACTOR INTERLOCKING ARRANGEMENT SHALL BE PROVIDED. CONTROL/AUXILIARY BUS SHALL RUN THROUGH OUT THE LENGTH OF THE MAIN/ VERTICAL BUSALLEY. CONTROL SUPPLY THROUGH MCB TO INDIVIDUAL FEEDER SHALL BE TAPPED DIRECTLY FROM THE CONTROL BUS.
14. MCCB RATED ABOVE 200A SHALL BE WITH MICROPROCESSOR RELEASE WITH O.C/S.C AND INBUILT E/F PROTECTION. MCCB UP TO AND INCLUDING 200A SHALL BE WITH THERMO MAGNETIC RELEASE WITH ADJUSTABLE O.L AND ADJUSTABLE S/C PROTECTION. ALL MCCB'S SHALL BE PROVIDED WITH EXTENDED ROTARY HANDLE, TERMINAL SPREADER, AUXILIARY CHANGE OVER AND TRIP CONTACT AND SHALL BE 50KA, ICS =100% ICU.
15. ALL SWITCHGEAR RATINGS ARE MINIMUM & OF INDICATIVE NATURE ONLY. PANEL VENDOR SHALL PROVIDE HIGHER RATING AS REQUIRED & STARTER SWITCHGEAR SHALL MEET THE REQUIREMENT OF TYPE-2 CO-ORDINATION AS PER IS: 60947.
16. ALL INDICATING METERS SHALL BE DIGITAL TYPE & CT SHALL BE RESIN CAST WITH MIN. ACCURACY CL.0.5 OR BETTER FOR CT OF MFM, APFC. CT FOR AMMETER SHALL BE CL: 1. MFM SHALL BE OF 0.5 CLASS & DISPLAY VARIOUS PARAMETERS INCLUDING LINE VOLTAGE AND PHASE CURRENTS, MAXIMUM DEMAND (FOR INCOMER), KW, PF, FREQUENCY, PHASE SEQUENCE, kVA, kVAr, kWH, kVAH, kVAth, ETC. WITH COMMON PORT. MFM SHALL BE WITH RS485 COMMUNICATION PORT WITH MODBUS PROTOCOL FOR REMOTE COMMUNICATION WITH NECESSARY SOFTWARE.
17. SHORTING LINK TYPE TERMINAL SHALL BE PROVIDED FOR ALL CT'S IN THE METERING COMPARTMENT. RING TYPE LUGS SHALL BE USED FOR CT WIRING.
18. TERMINAL FOR ABOVE 2.5 SQ.MM CABLE SIZE SHALL BE BOLTED TYPE. PROVIDE MINIMUM 4 NOS. OR 20% SPARE TERMINALS WHICHEVER IS HIGHER FOR CONTROL CABLES.
19. PROVIDE TERMINAL FOR TRIP INTERLOCK FOR FUTURE USE.(SPARE SHALL BE SUPPLIED WITH SHORT LINK)
20. ALL OUT GOING AND IN COMING CABLE CONNECTIONS MUST BE THROUGH CONNECTORS/ BUS LINK AS THE CASE MAY BE IN CABLE ALLEY ONLY.
21. POWER FACTOR IMPROVEMENT CAPACITORS SHALL BE HEAVY DUTY MPP/ GAS FILLED TYPE. CAPACITORS SHALL HAVE DIELECTRIC LOSSES <= 0.2 W/kVAr.
22. CONTACTOR FOR CAPACITOR SHALL BE CAPACITOR DUTY ONLY AND SHALL BE CONTROLLED THROUGH PROGRAMMABLE ON-DELAY TIMER.
23. ILLUMINATION SHALL BE PROVIDED FOR ALL CABLE ALLEYS WITH LED PANEL LIGHT PROTECTED BY MCB.
24. SPACE HEATER SHALL BE PROVIDED IN EACH VERTICAL SECTION WITH THERMOSTAT CONTROL.
25. FEEDER FOR EXTERNAL LIGHTING SHALL BE WITH PROGRAMMABLE TIME SWITCH OPERATED.
26. CONTROL WIRING SHALL BE WITH FRLS PVC INSULATED STRANDED COPPER WIRE OF 1.5 MM² SIZE FOR PT & OTHER CONNECTIONS AND 2.5 MM² FOR CT CIRCUITS AND SHALL BE COLOUR CODED.
27. ALL POWER MCCB SHALL BE DOOR INTERLOCKED. ALL POWER MCB'S SHALL BE OPERATED FROM DOOR.
28. INDICATING LAMP SHALL BE MINIMUM 20 MM DIA. LED TYPE WITH SERIES RESISTANCE, WITH METAL BODY.
29. PUSH BUTTON SHALL BE MOMENTARY TYPE; 2 NO & 2 NC CONTACTS OF 10 A @ 240 V AC RATING. STOP PB SHALL BE MUSHROOM HEADED STAYPUT & LOCKABLE TYPE.
30. EARTH BUS SHALL BE OF HOT DIP GALVANISED GI/ AL OF SUITABLE SIZE FOR FAULT LEVEL OF PANEL AS SPECIFIED IN TECH SPEC AND SHALL RUN THROUGH OUT THE LENGTH OF THE PANEL.
31. AUTO-MANUAL AND LOCAL/REMOTE SELECTOR SWITCHES SHALL BE PROVIDED FOR ALL STARTERS. DRIVES SHALL OPERATE THROUGH PLC WHEN SELECTED IN AUTO MODE. IN MANUAL MODE THE DRIVE SHALL OPERATE MANUALLY THROUGH MCC PB OR THROUGH LCS PB WHEN LOCAL/REMOTE SWITCH IS SELECTED IN LOCAL MODE OR REMOTE MODE RESPECTIVELY. POTENTIAL FREE CONTACTS SHALL BE PROVIDED TO MONITOR DRIVE STATUS SIGNALS (A/M SWITCH STATUS, DRIVE ON/OFF STATUS & DRIVE TRIP STATUS) AT PLC.
32. DRY RUN/SAFETY PROTECTION SHALL BE HARDWIRED INDEPENDENT OF PLC CONTROLS.
33. LOW LEVEL SWITCH FOR DRY RUN PROTECTION PUMPS SHALL BE INTERLOCKED AT RESPECTIVE STARTERS. MULTIPLYING RELAY IN REQUIRED NOS. AND AS INDICATED IN SLD SHALL BE PROVIDED IN ANY ONE STARTER & REST ASSOCIATED STARTERS SHALL BE SUITABLY INTERLOCKED.
34. ALL MOTOR RATINGS SHALL BE PROVIDED AS PER APPROVED MECHANICAL EQUIPMENT VENDOR DRAWING. MOTOR RATING AS INDICATED IS MINIMUM OR SHALL BE HIGHER AS RECOMMENDED BY PUMP VENDORS, AND BIDDER SHALL PROVIDE STARTER / PANEL TO SUIT THE SAME AT NO EXTRA COST.
35. ALL MCB'S SHALL BE 'C CURVE', 10 KA & MCB FOR CAPACITOR FEEDER SHALL BE 'D CURVE' ONLY
36. VACANT SPACE ON INCOMER & BUS COUPLER PANEL SHALL NOT BE USED FOR MOUNTING THE STARTER, SWITCHGEAR MODULE & FIXED CAPACITOR FEEDER.
37. ALL CONTACTOR SHALL BE AC3 DUTY EXCEPT FOR CONTACTOR OF OUTDOOR LDB FEEDER WHICH SHALL BE AC1 DUTY & 4POLE. BY PASS CONTACTOR USED IN SOFT STARTER SHALL BE AC1/AC3 AS RECOMMENDED BY SOFT STARTER OEM.
38. FOLLOWING SHALL BE CONSIDERED / PROVIDED FOR ALL SOFT STARTER / VFD PANELS (CUBICLES) :
  - A. SOFT STARTER / VFD SHALL BE DERATED FOR CONTINUOUS OPERATING TEMP. OF 50° C AND THE DERATED CURRENT SHALL BE ATLEAST 10% ABOVE THE RATED CURRENT OF MOTOR/DRIVEN LOAD.
  - B. SOFT STARTER / VFD SHALL BE WITH INBUILT RS-485 MODBUS COMMUNICATIION PORT. INPUT TERMINAL FOR PT100 & THERMISTOR SHALL BE PROVIDED.
  - C. ADEQUATE NO. OF COOLING FANS (MIN. 2 NOS. OR HIGHER) SHALL BE PROVIDED FOR EACH CUBICLE TO ENSURE THAT OPERATING TEMP. WITHIN CUBICLE DOES NOT INCREASE 5° C OVER DESIGN AMBIENT TEMP. AIR INLET VENT & EXHAUST VENT SHALL BE PROVIDED WITH WASHABLE FILTER. COOLING FANS SHALL BE INTERLOCKED WITH ASSOCIATED SOFT STARTER / VFD SUCH THAT DRIVE SHALL NOT TURN ON IF ANY COOLING FAN IS NOT WORKING.
  - D. RTD/SUITABLE TEMP. SENSING ELEMENT SHALL BE PROVIDED IN EACH CUBICLE WITH REQUIRED INTERLOCK TO TRIP SOFT STARTER / VFD IN CASE OF TEMP. EXCEEDING SET TEMP. (50-55 °C) WITHIN ASSOCIATED CUBICLE
  - E. SOFT STARTER / VFD DISPLAY SHALL BE DOOR MOUNTED. DISPLAY UNIT IS MEANT ONLY FOR DISPLAY/MONITORING OF PARAMETERS.
  - F. THE RATING OF SWITCH GEAR, LINE CONTACTOR, SEMICONDUCTOR FUSE, NO. OF COOLING FANS IF REQUIRED MORE THEN 2 NOS. PER CUBICLE (CONSIDERING ALL APPLICABLE HEAT DISSIPATION FACTORS WITHIN CUBICLE), CONTROL WIRING, ETC. FOR SOFT STARTER / VFD FEEDERS SHALL BE AS RECOMMENDED BY SOFT STARTER / VFD VENDOR AND PANEL MANUFACTURER SHALL BE RESPONSIBLE FOR DESIGN & TO PROVIDE AS PER SOFT STARTER VENDOR RECOMMENDATION FOR SATISFACTORY OPERATION.
  - G. THE SOFT STARTER / VFD POWER & CONTROL CIRCUIT, RELEVANT BOM & CUBICLE SIZING (MINIMUM OR HIGHER SIZE AS SPECIFIED IN TECH SPECIFICATION) SHALL BE GOT VETTED BY PANEL MANUFACTURER / CONTRACTOR FROM SOFT STARTER VENDOR. MCCB/ACB ON LOGIC SHALL BE INTERLOCKED WITH STARTING LOGIC OF SOFT STARTER/VFD. SOFT STARTER/VFD SHALL CLOSE ONLY WHEN ITS MCCB/ACB IS CLOSED.
  - H. VFD SHALL BE WITH INPUT & OUTPUT FILTER CHOKE AS PER RECOMMEDATION OF VFD OEM FOR HARMONIC MITIGATION.
39. ACTUATOR FEEDER OF VALVES / GATES SHALL BE PROVIDED IN SEPERATE COMPARTMENT AND MCB SHALL BE OPERATED FROM THE DOOR ITSELF. ACTUATOR FEEDER OF VALVES FOR STARTER SHALL BE PROVIDED IN STARTER COMPARTMENT.
40. POWER WIRING OF PMCC / MCC / APFC SHALL BE AS PER TENDER SPECIFICATION.
41. WIRING OF RS-485 WHEREVER PROVIDED SHALL BE BROUGHT OUT UP TO EXTERNAL TB IN THE CABLE ALLEY. WIRING TO/FROM FIELD/PLC ETC SHALL BE BROUGHT UP TO EXT. TB IN CABLE ALLEY.

**LEGENDS :**

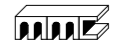

- |  |   |  |   |
|--|---|--|---|
|  | CIRCUIT-BREAKER (ACB) DRAWOUT TYPE  |  | MOTOR   |
|  | MCCB/MCB  |  | TERMINAL (POWER / CONTROL)                                  |
|  | LOCAL CONTROL STATION WITH START / STOP PUSH BUTTON NEAR MOTOR  |  | RED FOR EMER. OFF / STOP PUSH BUTTON                        |
|  | LOCAL CONTROL STATION WITH START / STOP PUSH BUTTON NEAR MOTOR WITH AMMETER                                 |  | GREEN FOR START/ON PUSH BUTTON                              |
|  | LOCAL CONTROL STATION WITH START / STOP, SPEED UP & DOWN PUSH BUTTON NEAR MOTOR                             |  | INDICATION  |
|  | CAPACITIR BANK  |  | LOCAL/REMOTE MODE SELECTOR SWITCH                           |
|  | POWER FUSE  |  | AUTO MANUAL MODE SELECTOR SWITCH                            |
|  | AMMETER SELECTOR SWITCH   |  | SPEED UP/DOWN   |
|  | VOLTMETER SELECTOR SWITCH   |  | THERMAL OVERCURRENT RELAY                                   |
|  | AMMETER   |  | SHORT CIRCUIT / EARTH FAULT UNDER VOLTAGE RELEASE           |
|  | VOLTMETER   |  | HEAVY-DUTY SWITCH   |
|  | POWER CONTACTOR   |  | THERMAL OVER CURRENT RELAY                                  |
|  | CURRENT TRANSFORMER   |  | TIMER   |
|  | THERMOSTATE FOR TEMP. MONITORING  |  | SPACE HEATER FOR MOTOR                                      |
|  | MULTI FUNCTION METER  |  | SOFT STARTER (S/S) WITH INTERNAL/ EXTERNAL BYPASS CONTACTOR |
|  | MOTOR PROTECTION RELAY, SPP WITH UV & OV (RS-485) AS PER SPEC.  |  | THERMAL MAGNETIC MCCB                                       |
|  | TEN CHANNEL TEMPERATURE SCANNER WITH POTENTIAL FREE CONTACTS FOR MOTOR WINDING & BEARING TEMP. (RTD-PT-100) |  | MICROPROCESSOR MCCB   |
|  | MULTIPLICATION RELAY (1 INCOMING + 6 OUTGOING)  |  | MICROPROCESSOR MOTOR DUTY MCCB                              |
|  | POWER FACTOR METER  |  | THERMAL MAGNETIC ACB  |
|  |   |  | MICROPROCESSOR ACB  |
|  |   |  | ELCTRICALLY OPERATED & DRAWOUT TYPE                         |
|  |   |  | POWER JUNCTION BOX  |
|  |   |  | CONTROL JUNCTION BOX  |

ISSUED FOR TENDER PURPOSE ONLY	<input checked="" type="checkbox"/>
ISSUED FOR ENQUIRY PURPOSE ONLY	<input type="checkbox"/>
ISSUED FOR APPROVAL	<input type="checkbox"/>
ISSUED FOR CONSTRUCTION	<input type="checkbox"/>

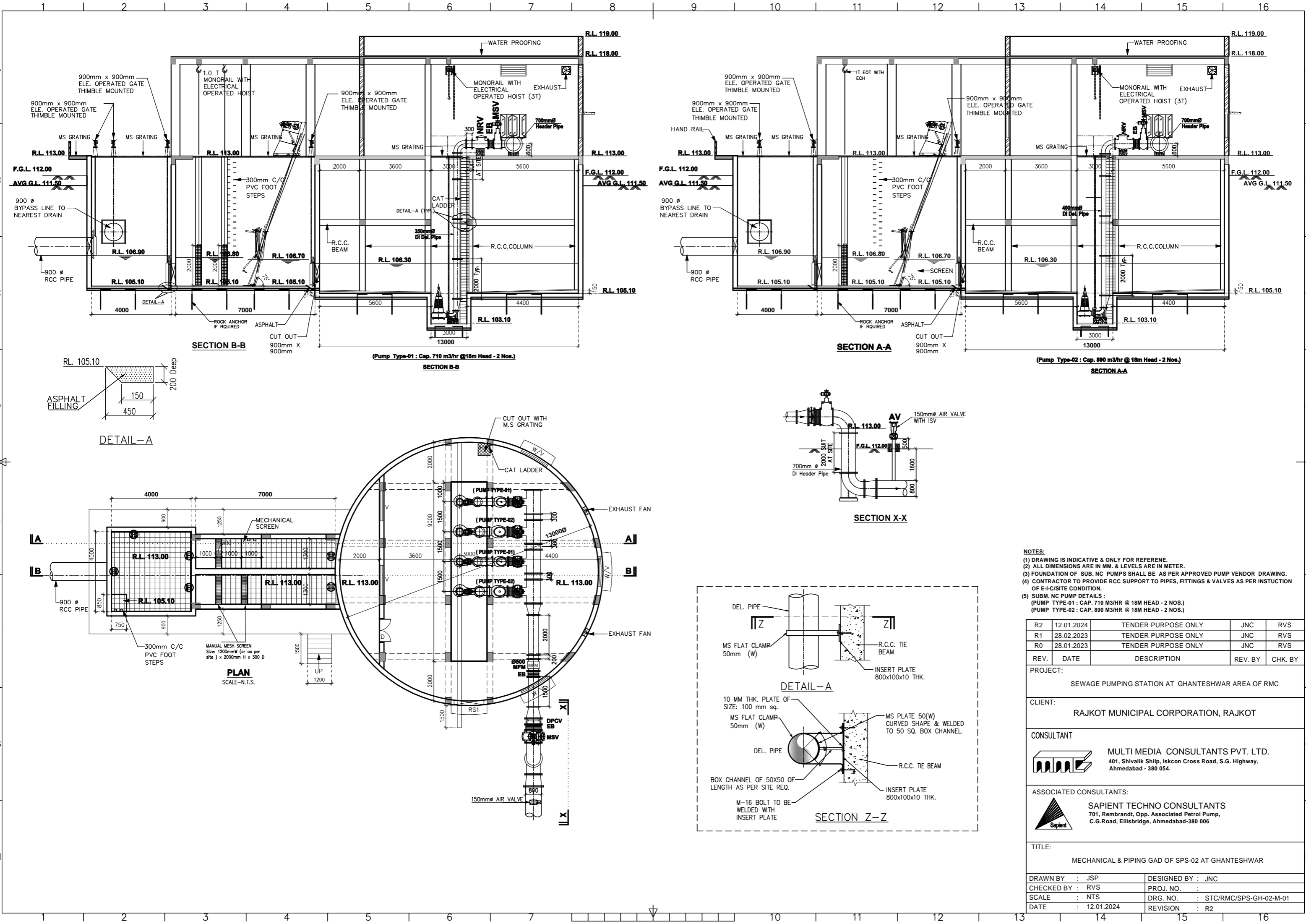
R0	12.01.2024	TENDER PURPOSE ONLY	APP	RVS
REV.	DATE	DESCRIPTION	REV. BY	CHK. BY
PROJECT: SEWAGE PUMPING STATION-01 AT GHANTESHWAR OF RMC				
CLIENT: RAJKOT MUNICIPAL CORPORATION, RAJKOT				
CONSULTANTS:		<b>multi media consultants pvt. ltd.</b>		
		401, Shivalik Shilp, Iskcon Cross Road, S.G. Highway, Ahmedabad - 380 054.		
ASSOCIATE CONSULTANTS:		<b>SAPIENT TECHNO CONSULTANTS</b>		
		701, Rembrandt, Opp. Associated Petrol Pump, C.G.Road, Ellisbridge, Ahmedabad-380 006 E-mail :- sapient_ahd@sapient.net.in		
TITLE: LT PMCC SINGLE LINE DIAGRAM (SHEET 1 OF 2)				
DRAWN BY : ARJ		DESIGNED BY : APP		
CHECKED BY : APP		PROJ. NO. :		
SCALE : NTS		DRG. NO. : STC/RMC/SPS-01/G/E-02B		
DATE : 12.01.2024		REVISION : R0		



PMCC PANEL  
AT GHANTESHWER  
SPS-01

REV.	DATE	DESCRIPTION	REV. BY	CHK. BY
R0	12.01.2024	TENDER PURPOSE ONLY	APP	RVS
PROJECT: SEWAGE PUMPING STATION-01 AT GHANTESHWAR OF RMC				
CLIENT: RAJKOT MUNICIPAL CORPORATION, RAJKOT				
CONSULTANTS:  multi media consultants pvt. ltd. 401, Shivalik Shilp, Iskcon Cross Road, S.G. Highway, Ahmedabad - 380 054.				
ASSOCIATE CONSULTANTS:  SAPIENT TECHNO CONSULTANTS 701, Rembrandt, Opp. Associated Petrol Pump, C.G.Road, Ellisbridge, Ahmedabad-380 006 E-mail :- sapient_ahd@sapient.net.in				
TITLE: LT PMCC SINGLE LINE DIAGRAM				
(SHEET 2 OF 2)				
DRAWN BY : ARJ		DESIGNED BY : APP		
CHECKED BY : APP		PROJ. NO. :		
SCALE : NTS		DRG. NO. : STC/RMC/SPS-01/G/E-02B		
DATE : 12.01.2024		REVISION : : R0		

- BY PUMP MANUFACTURER  
M  
22 KW  
2 NOS.
- BY PUMP MANUFACTURER  
M  
15 KW  
2 NOS.
- BY PUMP MANUFACTURER  
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3 NOS.
- BY PUMP MANUFACTURER  
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- NOTES:**
- (1) DRAWING IS INDICATIVE & ONLY FOR REFERENCE.
  - (2) ALL DIMENSIONS ARE IN MM. & LEVELS ARE IN METER.
  - (3) FOUNDATION OF SUB. NC PUMPS SHALL BE AS PER APPROVED PUMP VENDOR DRAWING.
  - (4) CONTRACTOR TO PROVIDE RCC SUPPORT TO PIPES, FITTINGS & VALVES AS PER INSTRUCTION OF E-I/SITE CONDITION.
  - (5) SUBM. NC PUMP DETAILS :  
 (PUMP TYPE-01 : CAP. 710 M<sup>3</sup>/HR @ 18M HEAD - 2 NOS.)  
 (PUMP TYPE-02 : CAP. 890 M<sup>3</sup>/HR @ 18M HEAD - 2 NOS.)

R2	12.01.2024	TENDER PURPOSE ONLY	JNC	RVS
R1	28.02.2023	TENDER PURPOSE ONLY	JNC	RVS
R0	28.01.2023	TENDER PURPOSE ONLY	JNC	RVS
REV.	DATE	DESCRIPTION	REV. BY	CHK. BY

PROJECT: SEWAGE PUMPING STATION AT GHANTESHWAR AREA OF RMC

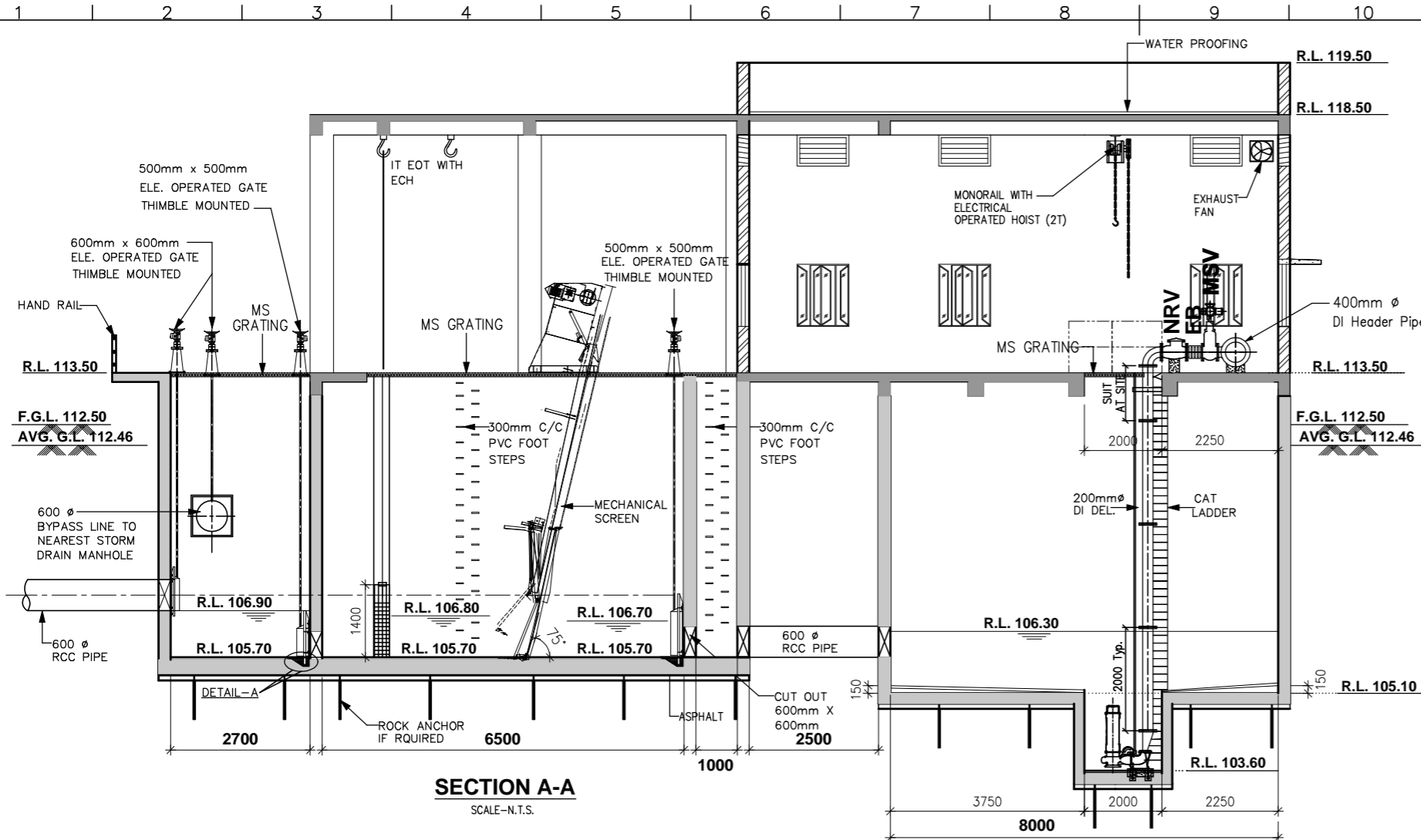
CLIENT: RAJKOT MUNICIPAL CORPORATION, RAJKOT

CONSULTANT: **MULTI MEDIA CONSULTANTS PVT. LTD.**  
 401, Shivalik Ship, Iskon Cross Road, S.G. Highway, Ahmedabad - 380 054.

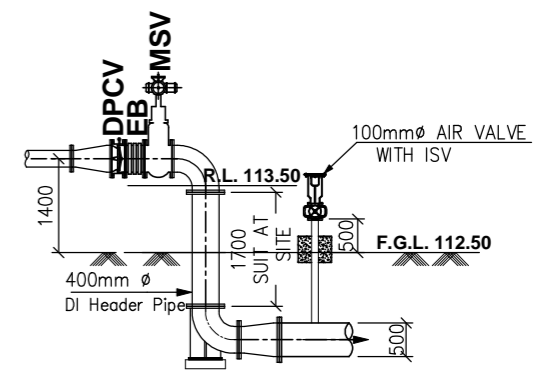
ASSOCIATED CONSULTANTS: **SAPIENT TECHNO CONSULTANTS**  
 701, Rembrandt, Opp. Associated Petrol Pump, C.G.Road, Ellisbridge, Ahmedabad-380 006

TITLE: MECHANICAL & PIPING GAD OF SPS-02 AT GHANTESHWAR

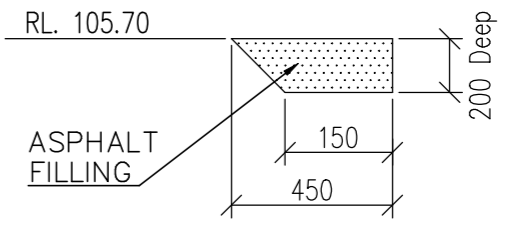
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CHECKED BY : RVS	PROJ. NO. :
SCALE : NTS	DRG. NO. : STC/RMC/SPS-GH-02-M-01
DATE : 12.01.2024	REVISION : R2



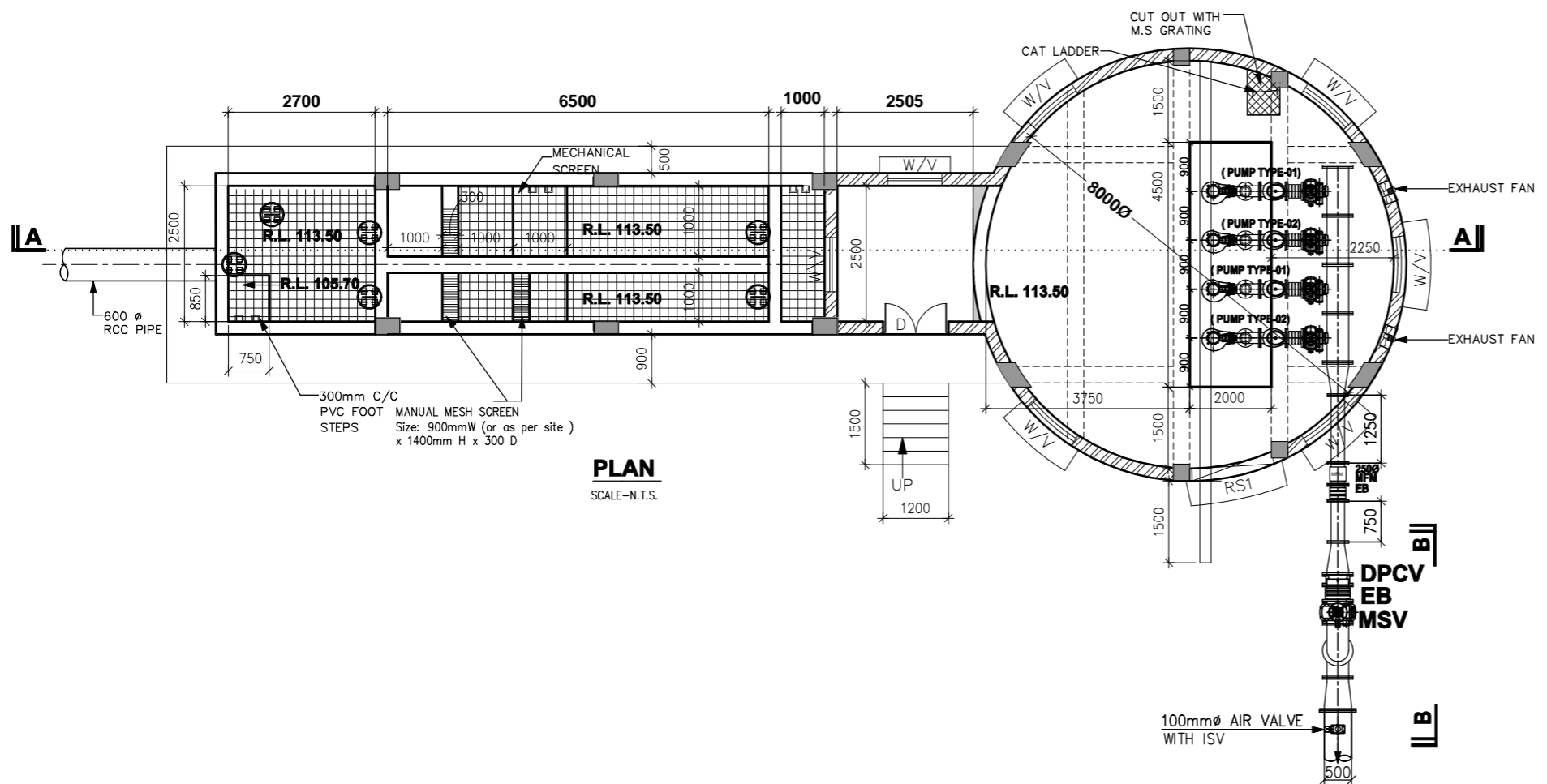
**SECTION A-A**  
SCALE-N.T.S.



**SECTION B-B**



**DETAIL-A**



**PLAN**  
SCALE-N.T.S.

- NOTE:**
- (1) Drawing is indicative & only for reference.
  - (2) ALL DIMENSIONS ARE IN MM. & LEVELS ARE IN METER.
  - (3) Foundation of Sub. NC Pumps shall be as per approved pump vendor drawing.
  - (4) Contractor to provide RCC support to pipes, fittings & valves as per instruction of E-I-C/site condition.
  - (5) Subm. NC Pump Details :  
(Pump Type-01 : Cap. 170 m3/hr @ 16m Head - 2 Nos.)  
(Pump Type-02 : Cap. 250 m3/hr @ 16m Head - 2 Nos.)

REV.	DATE	DESCRIPTION	REV. BY	CHK. BY
R1	12.01.2024	TENDER PURPOSE ONLY	JNC	RVS
R0	07.12.2023	TENDER PURPOSE ONLY	JNC	RVS

PROJECT: SEWAGE PUMPING STATION AT GHANTESHWAR AREA OF RMC

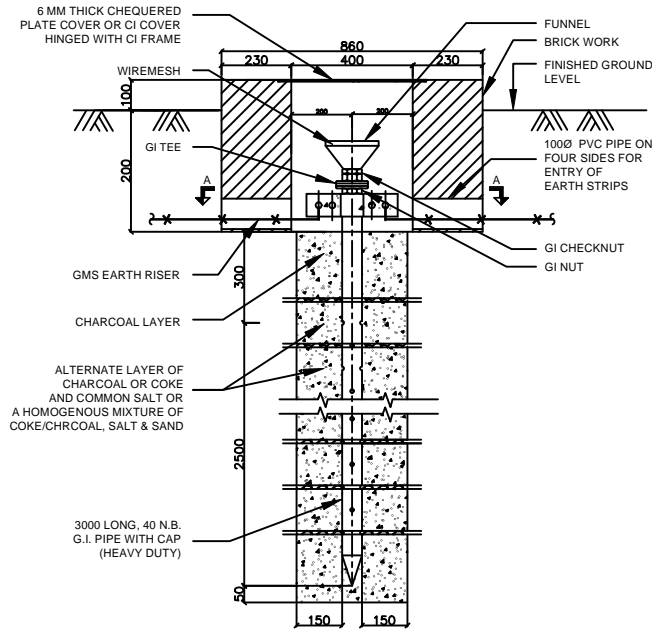
CLIENT: RAJKOT MUNICIPAL CORPORATION, RAJKOT

CONSULTANT: **MULTI MEDIA CONSULTANTS PVT. LTD.**  
401, Shivalik Shilp, Iskon Cross Road, S.G. Highway, Ahmedabad - 380 054.

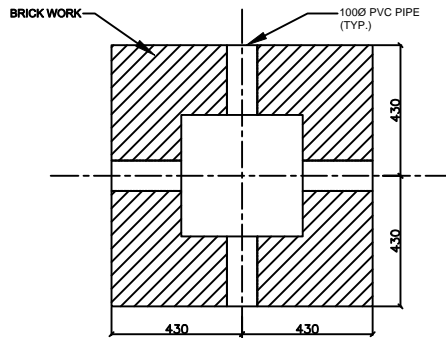
ASSOCIATE CONSULTANTS: **SAPIENT TECHNO CONSULTANTS**  
701, Rembrandt, Opp. Associated Petrol Pump, C.G.Road, Ellisbridge, Ahmedabad-380 006

TITLE: MECHANICAL & PIPING GAD OF SPS-01 AT GHANTESHWAR

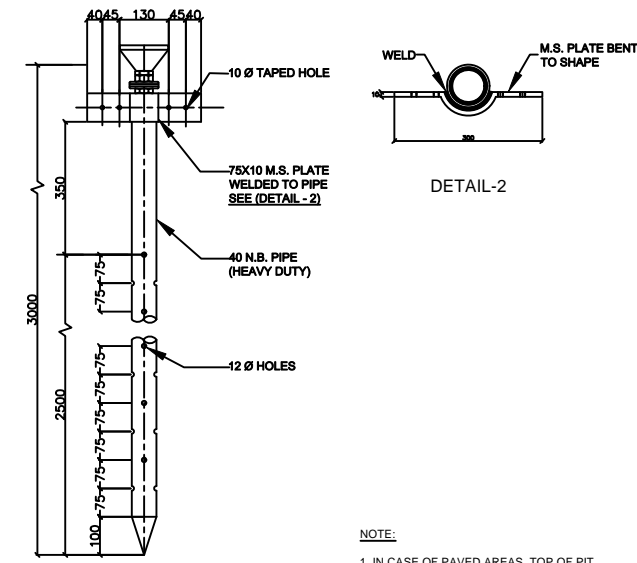
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CHECKED BY : RVS	PROJ. NO. :
SCALE : NTS	DRG. NO. : STC/RMC/SPS-G-01
DATE : 12.01.2024	REVISION : R1



TYPICAL ARRANGEMENT OF PIPE EARTHING ELECTRODE

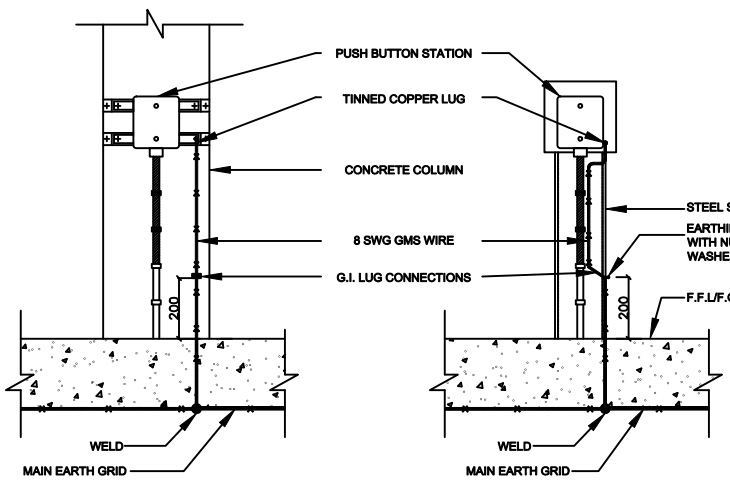


SECTION : A-A

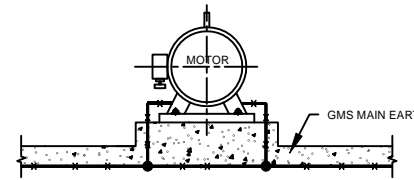


TYPICAL EARTH ELECTRODE FOR EARTHING SYSTEM

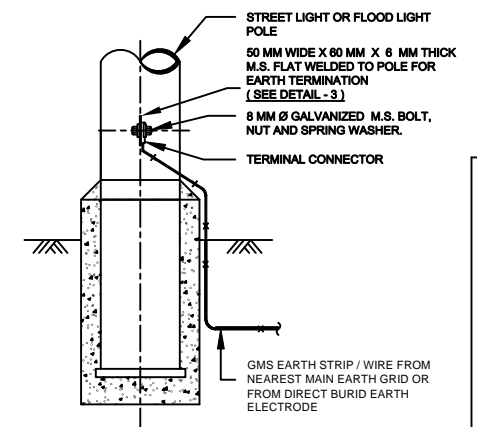
NOTE:  
1. IN CASE OF PAVED AREAS, TOP OF PIT SHALL BE FLUSHED WITH FFL, WHEREAS IN UNPAVED AREAS, TOP OF PIT SHALL BE PROJECTED 100MM ABOVE FGL.



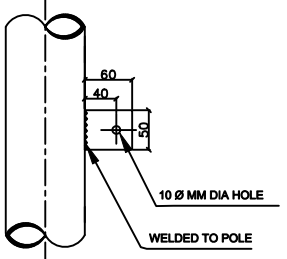
TYPICAL EARTH CONNECTION FOR PUSH-BUTTON STATION



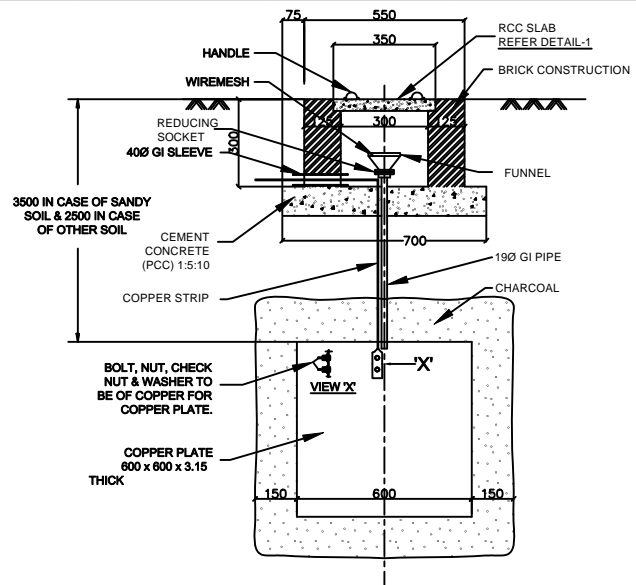
TYPICAL ARRANGEMENT FOR EARTHING OF MOTOR



TYPICAL EARTH CONNECTION FOR LIGHTING POLE

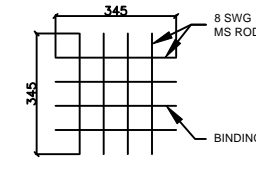


DETAIL - 3

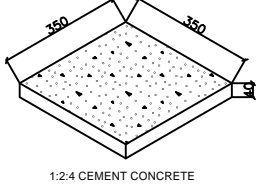


TYPICAL ARRANGEMENT OF COPPER PLATE EARTHING

NOTE:  
1. THE SIZE OF NUT, BOLT, CHECK NUT & WASHER WILL DEPEND UPON THE SIZE OF EARTH CONTINUITY STRIP



DETAIL OF REINFORCEMENT



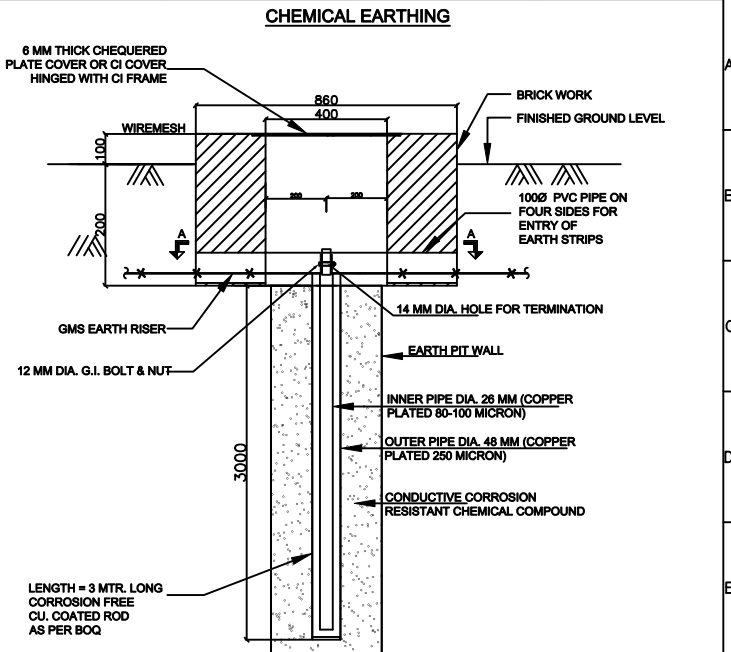
DETAIL-1

**TYPICAL SIZE FOR EARTH CONDUCTOR**

SR NO.	EQUIPMENT	CONDUCTOR SIZE
1.	HT PANEL	50 X 8 MM GI FLAT
2.	PMCC PANEL AND APFC PANELS.	50 X 8 MM GI FLAT
3.	TRANSFORMER BODY	50 X 8 MM GI FLAT
4.	MAIN EARTH GRID	50 X 8 MM GI FLAT
5.	TRANSFORMERS NEUTRAL	40 X 6 MM CU FLAT
6.	LADDER RACK AND CABLE TRAY AT SUITABLE POINTS	25 X 3 MM GI FLAT
7.	MOTORS	50 X 8 MM GI FLAT
8.	LOCAL PUSH BUTTON	8 SWG GI WIRE
9.	OUTDOOR STREET LIGHTING	8 SWG GI WIRE
10.	LIGHTING DISTRIBUTION BOARDS / SCREEN PANEL / TPN SOCKET	8 SWG GI WIRE

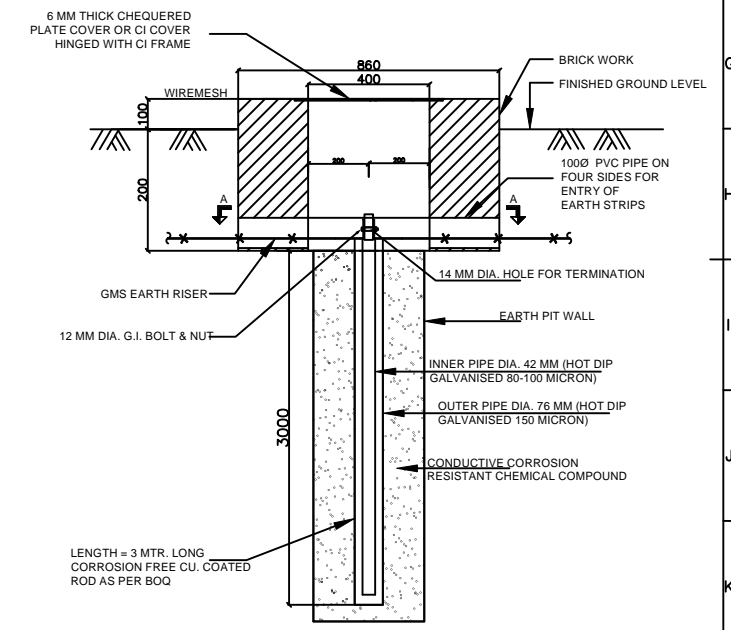
**NOTES:**

- THE EARTHING SYSTEM SHALL GENERALLY CONFORM TO IS : 3043.
- THE EARTH GRID SHALL BE CONNECTED WITH 3000 MM. LONG G.I. PIPE ELECTRODE AS SHOWN IN THE DRAWING.
- ALL THE UNDER GROUND EARTHING CONNECTIONS SHALL BE DONE BY ELECTRIC ARC WELDING.
- ALL UNDERGROUND WELDING JOINTS SHALL BE COATED WITH TWO COAT OF ANTICORROSION BLACK PAINT.
- GALVANIZING OF EACH ELECTRODES, FLATS, WIRES, STRIPS, HARDWARES ETC. SHALL BE DONE BY HOT DIP GALVANIZING METHOD & THE AMOUNT OF GALVANIZING SHALL BE MIN. 610gm / SQ. Mtr.
- ALL RISERS SHALL BE BROUGHT 300mm. ABOVE FGL.
- ALL ELECTRICAL DEVICE / INSTRUMENT / PUSH BUTTON STATIONS ETC. SHALL BE EFFECTIVELY EARTHED WHETHER SPECIFICALLY SHOWN OR NOT.
- EARTH GRID CONDUCTOR SHALL BE LAID 500 MM BELOW FINISHED GROUND LEVEL.
- ELECTRICAL EARTH PIT SHALL NOT BE USED FOR EARTHING OF INSTRUMENTATION EQUIPMENT.
- THE EARTH ELECTRODE SYSTEM SHALL BE DESIGNED TO GIVE A COMBINED RESISTANCE VALUE OF NOT GREATER THAN 1.0 OHM.
- ALL ELECTRICAL EQUIPMENTS SHALL BE CONNECTED TO THE EARTH GRID AT TWO SEPARATE AND DISTINCT GROUND CONNECTIONS OF SIZES SPECIFIED IN TABLE. HOWEVER, LIGHTING FIXTURES SHALL BE EARTHED AT ONE POINT ONLY BY LOOP-IN, LOOP-OUT METHOD.
- THE FENCING SHALL BE AT A DISTANCE OF NOT LESS THAN 1.525 METRE ON ALL SIDES OF THE SUBSTATION (POLE STRUCTURE AND TRANSFORMER PLINTHS, AS APPLICABLE) TO ENSURE FREE MOVEMENT ALL ROUND.
- FENCING SHALL BE EARTHED PROPERLY COVERING ALL ROWS ON ALL SIDES.
- ALL DIMENSIONS ARE IN MM.



FOR NEUTRAL EARTHING (HT PANEL, TRANSFORMER, ETC)

TYPICAL ARRANGEMENT OF PIPE IN PIPE TYPE EARTHING ELECTRODE FOR CHEMICAL EARTHING (COPPER)



FOR BODY EARTHING (FOR TRANSFORMER, LT PANEL AND ALL OTHER EQUIP)

TYPICAL ARRANGEMENT OF PIPE IN PIPE TYPE EARTHING ELECTRODE FOR CHEMICAL EARTHING

RO	12.01.2024	TENDER PURPOSE ONLY	APP	RVS
REV.	DATE	DESCRIPTION	REV. BY	CHK. BY
PROJECT: SEWAGE PUMPING STATION (SPS-01/02) AT GHANTESHWAR OF RMC				
CLIENT: RAJKOT MUNICIPAL CORPORATION, RAJKOT				
CONSULTANTS: <b>multi media consultants pvt. ltd.</b> 401, Shivalki Shilp, Iskon Cross Road, S.G. Highway, Ahmedabad - 380 054.				
ASSOCIATE CONSULTANTS: <b>SAPIENT TECHNO CONSULTANTS</b> 701, Rembrandt, Opp. Associated Petrol Pump, C.G.Road, Ellisbridge, Ahmedabad-380 006 E-mail :- sapient_ahd@sapient.net.in				
TITLE: TYPICAL EARTHING DETAIL (SHEET 1 OF 4)				
DRAWN BY : ARJ		DESIGNED BY : APP		
CHECKED BY : APP		PROJ. NO. :		
SCALE : NTS		DRG. NO. : STC/RMC/SPS/G/E-11		
DATE : 12.01.2024		REVISION : R0		

**NOTES ::**

- DESIGN TEMP. : 50° C MAX. 2° C MIN., REL. HUMIDITY : 95% MAX. 15% MIN. DEGREE OF PROTECTION: IP-52 MIN.
- THE LT (PCC/PMCC/MCC) PANELS SHALL BE METAL ENCLOSED, EXTENSIBLE ON BOTH SIDES, FLOOR MOUNTING; FREE STANDING; TOTALLY ENCLOSED,COMPARTMENTALISED, DUST, DAMP & VERMIN PROOF TYPE. EACH SECTION SHOULD HAVE SIDE SHEET ON BOTH SIDE. IT SHALL BE FIXED TYPE IN SINGLE/DOUBLE FRONT EXECUTION. AIR CIRCUIT BREAKER, SOFT STARTER & VFD PANELS SHALL BE IN SINGLE FRONT EXECUTION ONLY.
- THE PMCC/MCC SHALL BE FABRICATED OUT OF MIN. 14 SWG (2 MM THICK) CRCA SHEET FOR BODY, MOUNTING PLATE,DOORS & PARTITION .GLAND PLATE SHALL BE OF 3 MM THICK CRCA SHEET.
- OVERALL HEIGHT OF PANEL WITH BASE FRAME SHALL NOT EXCEED 2300 MM (FOR SOFT STARTER / VFD PANEL MAX. 2500 MM) AND WITH BOTTOM CABLE ENTRY / TOP ENTRY FOR BUS DUCT (WHERE APPLICABLE).
- THE PAINTING SHALL BE AFTER 7 TANK PRE TREATMENT PROCESS AND PAINT SHALL BE POWDER COATED WITH RAL 7035 FOR INDOOR AND OUTSIDE PORTION. MOUNTING PLATE SHALL BE WITH GLOSSY WHITE COLOUR.
- THE PANEL BASE FRAME SHALL BE OF MIN. ISMC 100 X50X 5 AND SHALL BE PAINTED BLACK.
- BUS BARS SHALL BE OF EC GRADE ALUMINIUM DESIGNED FOR MAX. 85° C TEMP. i.e. 35° C TEMP. RISE OVER 50° C DESIGN TEMP. CURRENT DENSITY : 1SQ.MM = 0.8A. BUSBARS SHOULD RUN THROUGHOUT THE LENGTH OF THE PANEL WITH CLEARANCE OF 100MM FROM THE SIDES. NEUTRAL BUSBAR SHALL BE RATED FOR 50% OF PHASE BUSBAR. MINIMUM HEIGHT/WIDTH OF BUSBAR ALLEY SHALL BE 300MM OR HIGHER.
- MAIN, VERTICAL, AUXILARY, POWER FEEDER & STARTER'S BUSBARS/WIRES SIZE SHALL BE AS PER RESPECTIVE FEEDER RATING WITH CURRENT DENSITY AS MENTIONED ABOVE.
- ONLY ZINC PASSIVATED OR CADMIUM PLATED HIGH TENSILE STEEL BOLTS, NUTS & SPRING & FLAT WASHERS SHALL BE USED FOR BUSBAR JOINTS AND SUPPORTS.
- FOR ALL PMCC PANELS INCOMING ACB SHALL BE EDO FP ACB OR 4P MCCB AS SPECIFIED IN SLD. INCOMER BREAKER (ACB/MCCB) SHALL BE WITH MICROPROCESSOR BASED PROTECTION RELEASES FOR OVER CURRENT, SHORT CIRCUIT, INBUILT EARTH FAULT WITH TIME DELAY. ACB SHALL BE PROVIDED WITH INBUILT COMMUNICATION RS-485 MODBUS WITH DISPLAY METERING (WITH ENERGY FOR INCOMER) & PROTECTION FOR CONTROL & MONITORING.
- ELECTRICAL & MECHANICAL INTERLOCK SHALL BE PROVIDED BETWEEN THE TWO GRID INCOMER BREAKERS AND BUSCOUPLER SO THAT ONLY TWO BREAKER IS ON AT A TIME. ALSO SUITABLE ELECTRICAL INTERLOCK SHALL BE PROVIDED BETWEEN GRID INCOMERS AND DG SET INCOMER FOR VARIOUS OPERATING CONDITIONS (WHERE DG SET IS APPLICABLE).
- SURGE PROTECTION DEVICE, 3P + N, TYPE 2 SHALL BE PROVIDED FOR THE BOTH THE INCOMERS.
- CONSTANT VOLTAGE TRANSFORMER/ CONTROL TRANSFORMER OF MINIMUM RATING 1.5 KVA OR HIGHER WITH TAPPING OF +/-5% IN STEPS OF 2.5%, FOR EACH BUS WITH CONTACTOR INTERLOCKING ARRANGEMENT SHALL BE PROVIDED, CONTROL/AUXILIARY BUS SHALL RUN THOUGH OUT THE LENGTH OF THE MAIN/ VERTICAL BUSALLEY. CONTROL SUPPLY THROUGH MCB TO INDIVIDUAL FEEDER SHALL BE TAPPED DIRECTLY FROM THE CONTROL BUS.
- MCCB RATED ABOVE 200A SHALL BE WITH MICROPRECESSOR RELEASE WITH O/C,S/C AND INBUILT E/F PROTECTION. MCCB UPTO AND INCLUDING 200A SHALL BE WITH THERMO MAGNETIC RELEASE WITH ADJUSTABLE O/L AND ADJUSTABLE S/C PROTECTION. ALL MCCB'S SHALL BE PROVIDED WITH EXTENDED ROTARY HANDLE, TERMINAL SPREADER, AUXILIARY CHANGE OVER AND TRIP CONTACT AND SHALL BE 50KA, ICS =100% ICU.
- ALL SWITCHGEAR RATINGS ARE MINIMUM & OF INDICATIVE NATURE ONLY. PANEL VENDOR SHALL PROVIDE HIGHER RATING AS REQUIRED & STARTER SWITCHGEAR SHALL MEET THE REQUIREMENT OF TYPE-2 CO-ORDINATION AS PER IS: 60947.
- ALL INDICATING METERS SHALL BE DIGITAL TYPE & CT SHALL BE RESIN CAST WITH MIN. ACCURACY CL.0.5 OR BETTER FOR CT OF MFM, APFC. CT FOR AMMETER SHALL BE CL: 1. MFM SHALL BE OF 0.5 CLASS & DISPLAY VARIOUS PARAMETERS INCLUDING LINE VOLTAGE AND PHASE CURRENTS, MAXIMUM DEMAND(FOR INCOMER), KW, PF, FREQUENCY, PHASE SEQUENCE, kVA, kVAr, kWh, kVAh, kVAh, ETC. WITH COMMON PORT. MFM SHALL BE WITH RS-485 COMMUNICATION PORT WITH MODBUS PROTOCOL FOR REMOTE COMMUNICATION WITH NECESSARY SOFTWARE.
- SHORTING LINK TYPE TERMINAL SHALL BE PROVIDED FOR ALL CT's IN THE METERING COMPARTMENT. RING TYPE LUGS SHALL BE USED FOR CT WIRING.
- TERMINAL FOR ABOVE 2.5 SQ.MM CABLE SIZE SHALL BE BOLT TYPE. PROVIDE MINIMUM 4 NOS. OR 20% SPARE TERMINALS WHICHEVER IS HIGHER FOR CONTROL CABLES.
- PROVIDE TERMINAL FOR TRIP INTERLOCK FOR FUTURE USE.(SPARE SHALL BE SUPPLEID WITH SHORT LINK)
- ALL OUT GOING AND IN COMING CABLE CONNECTIONS MUST BE THROUGH CONNECTORS/ BUS LINK AS THE CASE MAY BE IN CABLE ALLEY ONLY.
- POWER FACTOR IMPROVEMENT CAPACITORS SHALL BE HEAVY DUTY MPP/ GAS FILLED TYPE. CAPACITORS SHALL HAVE DIELECTRIC LOSSES <= 0.2 W/kVar.
- CONTACTOR FOR CAPACITOR SHALL BE CAPACITOR DUTY ONLY AND SHALL BE CONTROLLED THROUGH PROGRAMMABLE ON-DELAY TIMER.
- ILLUMINATION SHALL BE PROVIDED FOR ALL CABLE ALLEYS WITH LED PANEL LIGHT PROTECTED BY MCB.
- SPACE HEATER SHALL BE PROVIDED IN EACH VERTICAL SECTION WITH THERMOSTAT CONTROL.
- FEEDER FOR EXTERNAL LIGHTING SHALL BE WITH PROGRAMMABLE TIME SWITCH OPERATED.
- CONTROL WIRING SHALL BE WITH FRLS PVC INSULATED STRANDED COPPER WIRE OF 1.5 MM² SIZE FOR PT & OTHER CONNECTIONS AND 2.5 MM² FOR CT CIRCUITS AND SHALL BE COLOUR CODED.
- ALL POWER MCCB SHALL BE DOOR INTERLOCKED. ALL POWER MCB's SHALL BE OPERATED FROM DOOR.
- INDICATING LAMP SHALL BE MINIMUM 20 MM DIA. LED TYPE WITH SERIES RESISTANCE, WITH METAL BODY.
- PUSH BUTTON SHALL BE MOMENTARY TYPE; 2 NO & 2 NC CONTACTS OF 10 A @ 240 V AC RATING.STOP PB SHALL BE MUSHROOM HEADED STAYPUT & LOCKABLE TYPE.
- EARTH BUS SHALL BE OF HOT DIP GALVANISED GI/ AL OF SUITABLE SIZE FOR FAULT LEVEL OF PANEL AS SPECIFIED IN TECH SPEC AND SHALL RUN THROUGH OUT THE LENGTH OF THE PANEL.
- AUTO/MANUAL AND LOCAL/REMOTE SELECTOR SWITCHES SHALL BE PROVIDED FOR ALL STARTERS. DRIVES SHALL OPERATE THROUGH PLC WHEN SELECTED IN AUTO MODE. IN MANUAL MODE THE DRIVE SHALL OPERATE MANUALLY THROUGH MCC PB OR THROUGH LCS PB WHEN LOCAL/REMOTE SWITCH IS SELECTED IN LOCAL MODE OR REMOTE MODE RESPECTIVELY. POTENTIAL FREE CONTACTS SHALL BE PROVIDED TO MONITOR DRIVE STATUS SIGNALS (A/M SWITCH STATUS, DRIVE ON/OFF STATUS & DRIVE TRIP STATUS) AT PLC.
- DRY RUN/SAFETY PROTECTION SHALL BE HARDWIRED INDEPENDENT OF PLC CONTROLS.
- LOW LEVEL SWITCH FOR DRY RUN PROTECTION PUMPS SHALL BE INTERLOCKED AT RESPECTIVE STARTERS. MULTIPLYING RELAY IN REQUIRED NOS. AND AS INDICATED IN SLD SHALL BE PROVIDED IN ANY ONE STARTER & REST ASSOCIATED STARTERS SHALL BE SUITABLY INTERLOCKED.
- PROVISION FOR 230V AC SUPPLY WITH 2P MCB,6A RATING FOR H.T. PANEL AUX. SHALL BE MADE IN PCC. 2 NOS. SPARE MCB SHALL ALSO BE PROVIDED FOR FUTURE USE.
- ALL MOTOR RATINGS SHALL BE PROVIDED AS PER APPROVED MECHNICAL EQUIPMENT VENDOR DRAWING. MOTOR RATING AS INDICATED IS MINIMUM OR SHALL BE HIGHER AS RECOMMANDED BY PUMP VENDORS, AND BIDDER SHALL PROVIDE STARTER / PANEL TO SUIT THE SAME AT NO EXTRA COST.
- ALL MCB's SHALL BE 'C CURVE', 10 KA & MCB FOR CAPACITOR FEEDER SHALL BE 'D CURVE' ONLY
- VACANT SPACE ON INCOMER & BUS COUPLER PANEL SHALL NOT BE USED FOR MOUNTING THE STARTER, SWITCHGEAR MODULE & FIXED CAPACITOR FEEDER.
- ALL CONTACTOR SHALL BE AC3 DUTY EXCEPT FOR CONTACTOR OF OUTDOOR LDB FEEDER WHICH SHALL BE AC1 DUTY & 4POLE. BY PASS CONTACTOR USED IN SOFT STARTER SHALL BE AC1/AC3 AS RECOMMENDED BY SOFT STARTER OEM.
- FOLLOWING SHALL BE CONSIDERED / PROVIDED FOR ALL SOFT STARTER / VFD PANELS (CUBICLES) :
  - SOFT STARTER / VFD SHALL BE DERATED FOR CONTINUOUS OPERATING TEMP. OF 50° C AND THE DERATED CURRENT SHALL BE ATLEAST 10% ABOVE THE RATED CURRENT OF MOTOR/DRIVEN LOAD AS DECLARED IN IS 12615/BOQ.
  - SOFT STARTER / VFD SHALL BE WITH INBUILT RS-485 MODBUS COMMUNICATIION PORT. INPUT TERMINAL FOR PT100 & THERMISTOR SHALL BE PROVIDED.
  - ADEQUATE NO. OF COOLING FANS (MIN. 2 NOS. OR HIGHER) SHALL BE PROVIDED FOR EACH CUBICLE TO ENSURE THAT OPERATING TEMP. WITHIN CUBICLE DOES NOT INCREASE 5° C OVER DESIGN AMBIENT TEMP. AIR INLET VENT & EXHAUST VENT SHALL BE PROVIDED WITH WASHABLE FILTER. COOLING FANS SHALL BE INTERLOCKED WITH ASSOCIATED SOFT STARTER / VFD SUCH THAT DRIVE SHALL NOT TURN ON IF ANY COOLING FAN IS NOT WORKING.
  - RTD/SUITABLE TEMP. SENSING ELEMENT SHALL BE PROVIDED IN EACH CUBICLE WITH REQUIRED INTERLOCK TO TRIP SOFT STARTER / VFD IN CASE OF TEMP. EXCEEDING SET TEMP. (50-55 °C) WITHIN ASSOCIATED CUBICLE.
  - SOFT STARTER / VFD DISPLAY SHALL BE DOOR MOUNTED. DISPLAY UNIT IS MEANT ONLY FOR DISPLAY/MONITORING OF PARAMETERS.
  - THE RATING OF SWITCH GEAR, LINE CONTACTOR, SEMICONDUCTOR FUSE, NO. OF COOLING FANS IF REQUIRED MORE THEN 2 NOS. PER CUBICLE (CONSIDERING ALL APPLICABLE HEAT DISSIPATION FACTORS WITHIN CUBICLE), CONTROL WIRING, ETC. FOR SOFT STARTER / VFD FEEDERS SHALL BE AS RECOMMENDED BY SOFT STARTER / VFD VENDOR AND PANEL MANUFACTURER SHALL BE RESPONSIBLE FOR DESIGN & TO PROVIDE AS PER SOFT STARTER VENDOR RECOMMENDATION FOR SATISFACTORY OPERATION.
  - THE SOFT STARTER / VFD POWER & CONTROL CIRCUIT, RELEVANT BOM & CUBICLE SIZING (MINIMUM OR HIGHER SIZE AS SPECIFIED IN TECH SPECIFICATION) SHALL BE GOT VETTED BY PANEL MANUFACTURER / CONTRACTOR FROM SOFT STARTER VENDOR. MCCB/ACB ON LOGIC SHALL BE INTERLOCKED WITH STARTING LOGIC OF SOFT STARTER/VFD. SOFT STARTER/VFD SHALL CLOSE ONLY WHEN ITS MCCB/ACB IS CLOSED.
  - THE MINIMUM SIZE FOR ACB, SOFT STARTER & VFD CUBICLES, MCCB SHALL BE AS PER TABLE IN TECHNICAL SPECIFICATION OR HIGHER AS REQUIRED / RECOMMENDED BY ACB/SOFT STARTER VENDOR.
  - TEN CHANNEL TEMPERATURE SCANNER WITH RS-485 AS PER DETAILED SPECIFICATION SHALL BE PROVIDED IN SOFT STARTER / VFD MOTOR FEEDER (DOOR MOUNTED)FOR RATING 90 KW AND ABOVE OR AS PER PUMP MANUFACTURER RECOMMENDATION FOR SMALLER RATINGS ALSO.
  - TEN CHANNEL TEMPERATURE SCANNER AS ABOVE AND PMU (ON THE FEEDER DOOR) SHALL BE PROVIDED FOR SUBMERSIBLE PUMP STARTER FEEDER.
  - ACTUATOR FEEDER OF VALVES / GATES SHALL BE PROVIDED IN SEPERATE COMPARTMENT AND MCB SHALL BE OPERATED FROM THE DOOR ITSELF. ACTUATOR FEEDER OF VALVES FOR STARTER SHALL BE PROVIDED IN STARTER COMPARTMENT.
  - POWER WIRING OF PMCC / MCC / APFC SHALL BE AS PER TENDER SPECIFICATION.
  - WIRING OF RS-485 WHEREVER PROVIDED SHALL BE BROUGHT OUT UP TO EXTERNAL TB IN THE CABLE ALLEY. WIRING TO/FROM FIELD/PLC ETC SHALL BE BROUGHT UP TO EXT. TB IN CABLE ALLEY.

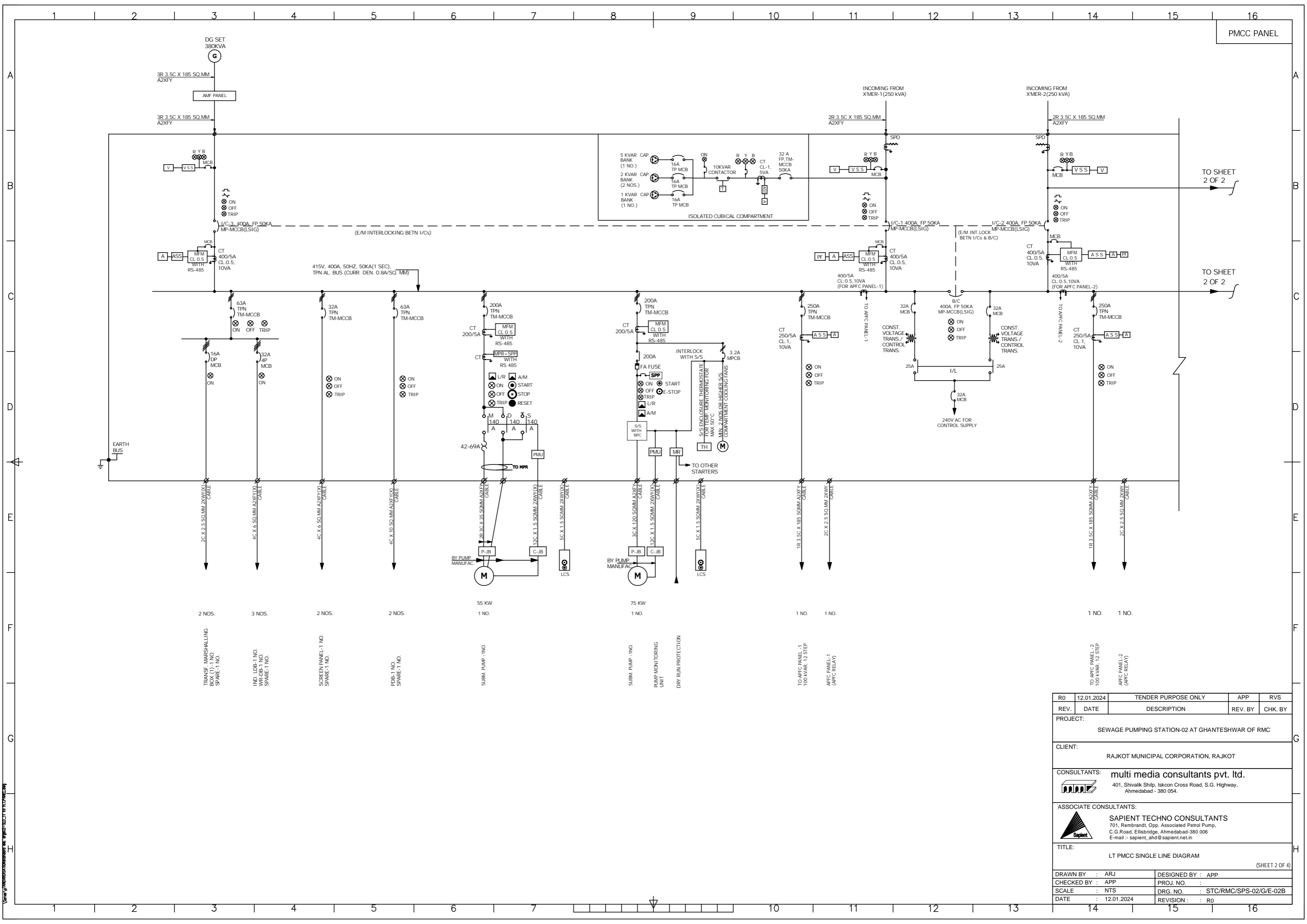
**LEGENDS ::**

	CIRCUIT-BREAKER (ACB) DRAWOUT TYPE		MOTOR
	MCCB/MCB		TERMINAL (POWER / CONTROL)
	LOCAL CONTROL STATION WITH START / STOP PUSH BUTTON NEAR MOTOR		RED FOR EMER. OFF / STOP PUSH BUTTON
	LOCAL CONTROL STATION WITH START / STOP PUSH BUTTON NEAR MOTOR WITH AMMETER		GREEN FOR START/ON PUSH BUTTON
	CAPACITIR BANK		INDICATION
	POWER FUSE		LOCAL/REMOTE MODE SELECTOR SWITCH
	AMMETER SELECTOR SWITCH		AUTO MANUAL MODE SELECTOR SWITCH
	VOLTMETER SELECTOR SWITCH		SPEED UP/DOWN
	AMMETER		THERMAL OVERCURRENT RELAY
	VOLTMETER		SHORT CIRCUIT / EARTH FAULT UNDER VOLTAGE RELEASE
	POWER CONTACTOR		HEAVY-DUTY SWITCH
	CURRENT TRANSFORMER		THERMAL OVER CURRENT RELAY
	THERMOSTATE FOR TEMP. MONITORING		TIMER
	MULTI FUNCTION METER		SPACE HEATER FOR MOTOR
	MOTOR PROTECTION RELAY, SPP WITH UV & OV (RS-485) AS PER SPEC.		SOFT STARTER (S/S) WITH INTERNAL/ EXTERNAL BYPASS CONTACTOR
	TEN CHANNEL TEMPERATURE SCANNER WITH POTENTIAL FREE CONTACTS FOR MOTOR WINDING & BEARING TEMP. (RTD-PT-100)		THERMAL MAGNETIC MCCB
	MULTIPLICATION RELAY (1 INCOMING + 6 OUTGOING)		MICROPROCESSOR MCCB
	POWER FACTOR METER		MICROPROCESSOR MOTOR DUTY MCCB
			THERMAL MAGNETIC ACB
			MICROPROCESSOR ACB
			ELCTRICALLY OPERATED & DRAWOUT TYPE
			POWER JUNCTION BOX
			CONTROL JUNCTION BOX

ISSUED FOR TENDER PURPOSE ONLY	<input checked="" type="checkbox"/>
ISSUED FOR ENQUIRY PURPOSE ONLY	<input type="checkbox"/>
ISSUED FOR APPROVAL	<input type="checkbox"/>
ISSUED FOR CONSTRUCTION	<input type="checkbox"/>

I/C-1	I/C-2	B/C	D, G I/C-3	APFC-1	APFC-2
ON	ON	OFF	OFF	ON	ON
ON	OFF	ON	OFF	ON	ON
OFF	ON	ON	OFF	ON	ON
OFF	OFF	ON	ON	OFF	OFF

R0	12.01.2024	TENDER PURPOSE ONLY	APP	RVS
REV.	DATE	DESCRIPTION	REV. BY	CHK. BY
PROJECT: SEWAGE PUMPING STATION-02 AT GHANTESHWAR OF RMC				
CLIENT: RAJKOT MUNICIPAL CORPORATION, RAJKOT				
CONSULTANTS: multi media consultants pvt. ltd. 401, Shivalik Ship, Iskon Cross Road, S.G. Highway, Ahmedabad - 380 054.				
ASSOCIATE CONSULTANTS: SAPIENT TECHNO CONSULTANTS 701, Rembrandt, Opp. Associated Petrol Pump, C.G.Road, Ellisbridge, Ahmedabad-380 006 E-mail :- sapient_ahd@sapient.net.in				
TITLE: LT PMCC SINGLE LINE DIAGRAM (SHEET 1 OF 4)				
DRAWN BY : ARJ		DESIGNED BY : APP		
CHECKED BY : APP		PROJ. NO. :		
SCALE : NTS		DRG. NO. : STC/RMC/SPS-02/G/E-02B		
DATE : 12.01.2024		REVISION : : R0		



PMCC PANEL

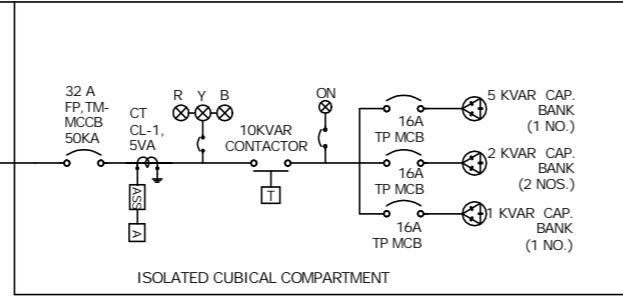
TO SHEET 2 OF 2

TO SHEET 2 OF 2

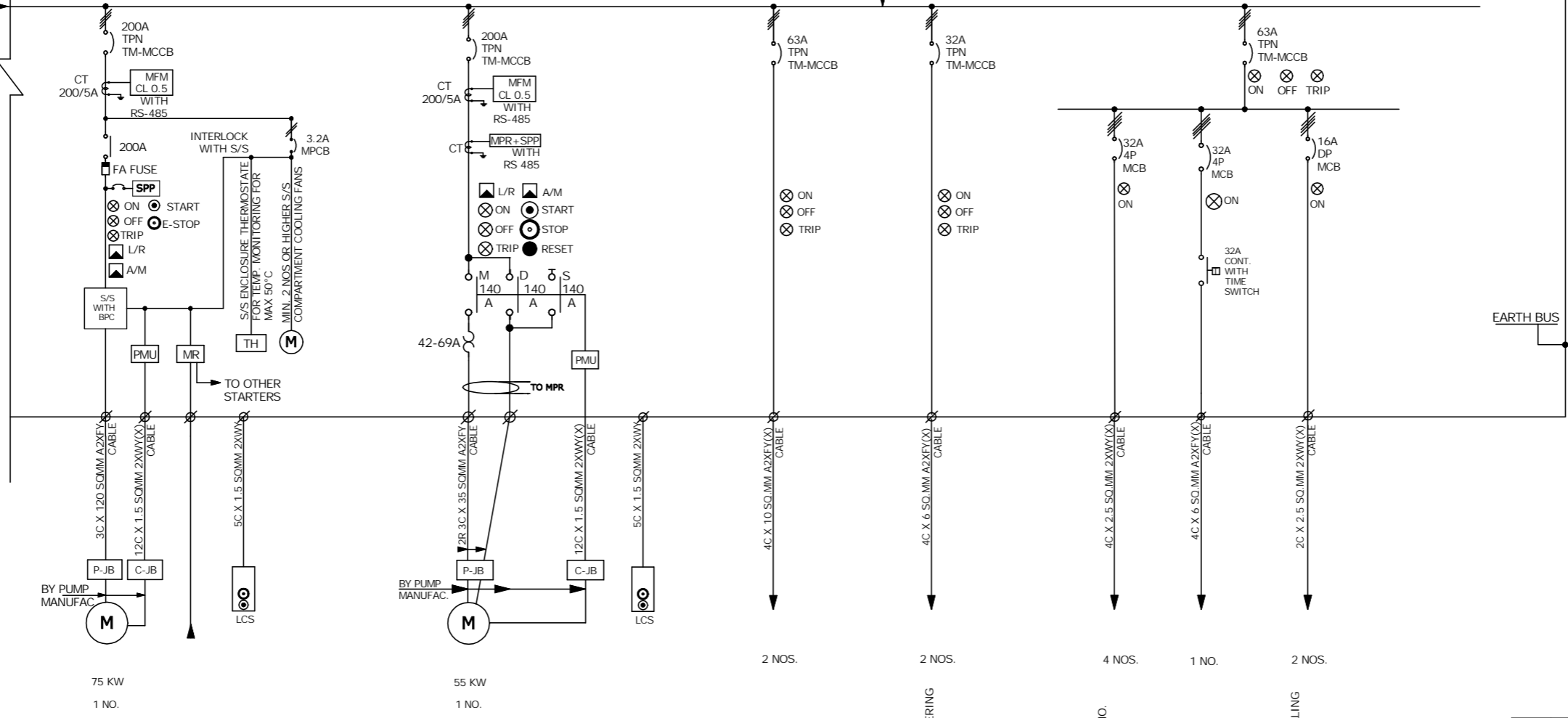
R0	12.01.2024	TENDER PURPOSE ONLY	APP	RVS
REV.	DATE	DESCRIPTION	REV. BY	CHK. BY
PROJECT: SEWAGE PUMPING STATION-02 AT GHANTESHWAR OF RMC				
CLIENT: RAJKOT MUNICIPAL CORPORATION, RAJKOT				
CONSULTANTS: multi media consultants pvt. ltd. 401, Shivalik Shilp, Iskon Cross Road, S.G. Highway, Ahmedabad - 380 054.				
ASSOCIATE CONSULTANTS: SAPIENT TECHNO CONSULTANTS 701, Rembrandt, Opp. Associated Petrol Pump, C.G.Road, Ellisbridge, Ahmedabad-380 006 E-mail : sapient_ahd@sapient.net.in				
TITLE: LT MCC SINGLE LINE DIAGRAM (SHEET 2 OF 4)				
DRAWN BY : ARJ		DESIGNED BY : APP		
CHECKED BY : APP		PROJ. NO. :		
SCALE : NTS		DRG. NO. : STC/RMC/SPS-02/G/E-02B		
DATE : 12.01.2024		REVISION : : R0		

FROM SHEET 1 OF 2

FROM SHEET 1 OF 2



415V, 400A, 50HZ, 50KA(1 SEC),  
TPN AL. BUS (CURR. DEN. 0.8A/SQ. MM)



75 KW  
1 NO.  
SUBM. PUMP -1NO.  
PUMP MONITORING UNIT  
DRY RUN PROTECTION

55 KW  
1 NO.  
SUBM. PUMP -1NO.

2 NOS.  
PDB-1 NO.  
SPARE-1 NO.

2 NOS.  
PORTABLE DEWATERING PUMP PANEL-1 NO.  
SPARE-1 NO.

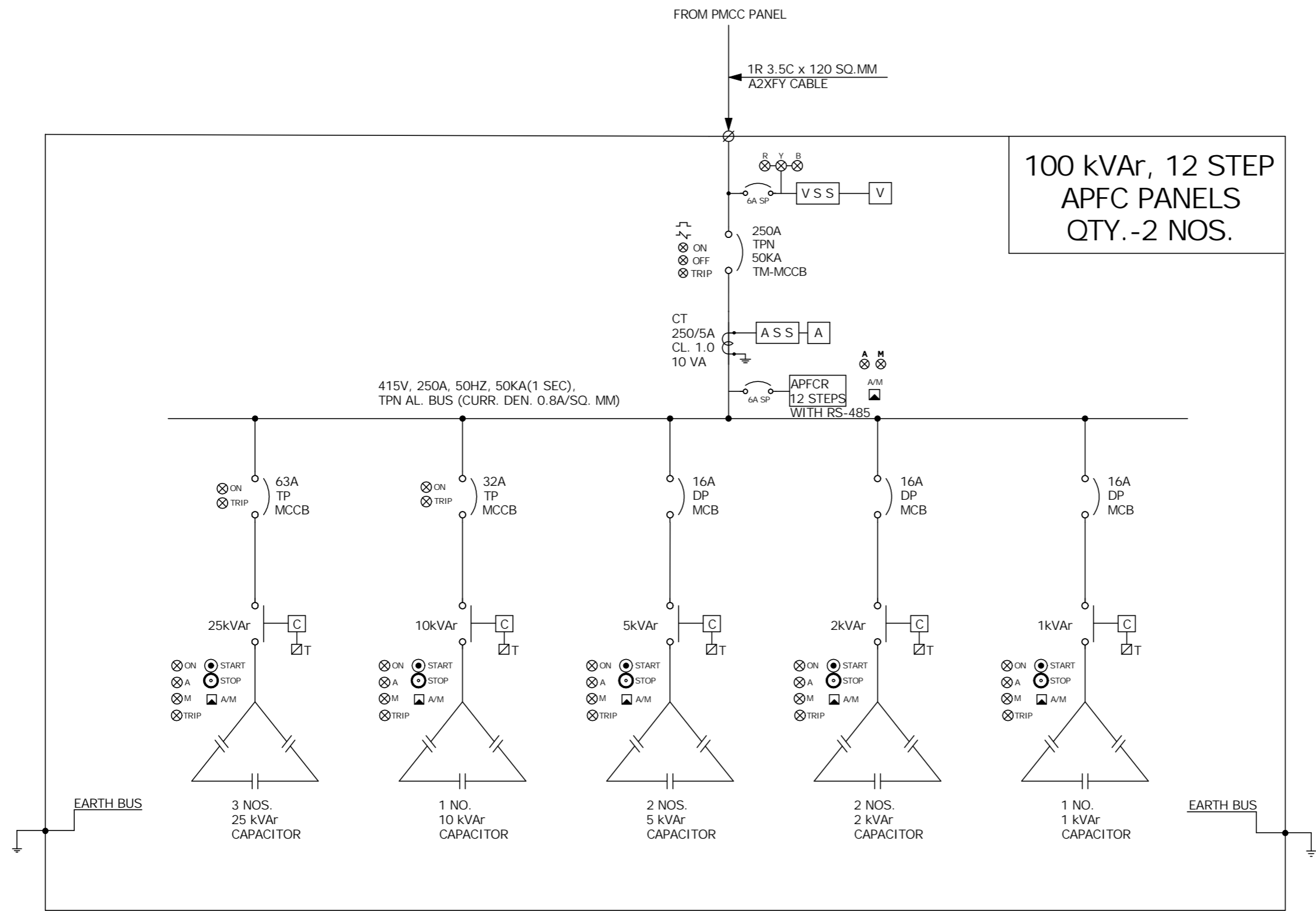
4 NOS.  
IOP/PLC PANEL-1 NO.  
EOT CRANE-1 NO.  
D.G CHARGING & SENSING-2 NOS.

1 NO.  
OUT. LDB-1 NO.

2 NOS.  
TRANSF. MARSHALLING BOX (2)-1 NO.  
SPARE-1 NO.

REV.	DATE	DESCRIPTION	REV. BY	CHK. BY
R0	12.01.2024	TENDER PURPOSE ONLY	APP	RVS
PROJECT: SEWAGE PUMPING STATION-02 AT GHANTESHWAR OF RMC				
CLIENT: RAJKOT MUNICIPAL CORPORATION, RAJKOT				
CONSULTANTS: multi media consultants pvt. ltd. 401, Shivalik Ship, Iskcon Cross Road, S.G. Highway, Ahmedabad - 380 054.				
ASSOCIATE CONSULTANTS: SAPIENT TECHNO CONSULTANTS 701, Rembrandt, Opp. Associated Petrol Pump, C.G.Road, Ellisbridge, Ahmedabad-380 006 E-mail : sapient_ahd@sapient.net.in				
TITLE: LT PMCC SINGLE LINE DIAGRAM (SHEET 3 OF 4)				
DRAWN BY : ARJ		DESIGNED BY : APP		
CHECKED BY : APP		PROJ. NO. :		
SCALE : NTS		DRG. NO. : STC/RMC/SPS-02/G/E-02B		
DATE : 12.01.2024		REVISION : R0		





**100 kVAr, 12 STEP  
APFC PANELS  
QTY.-2 NOS.**

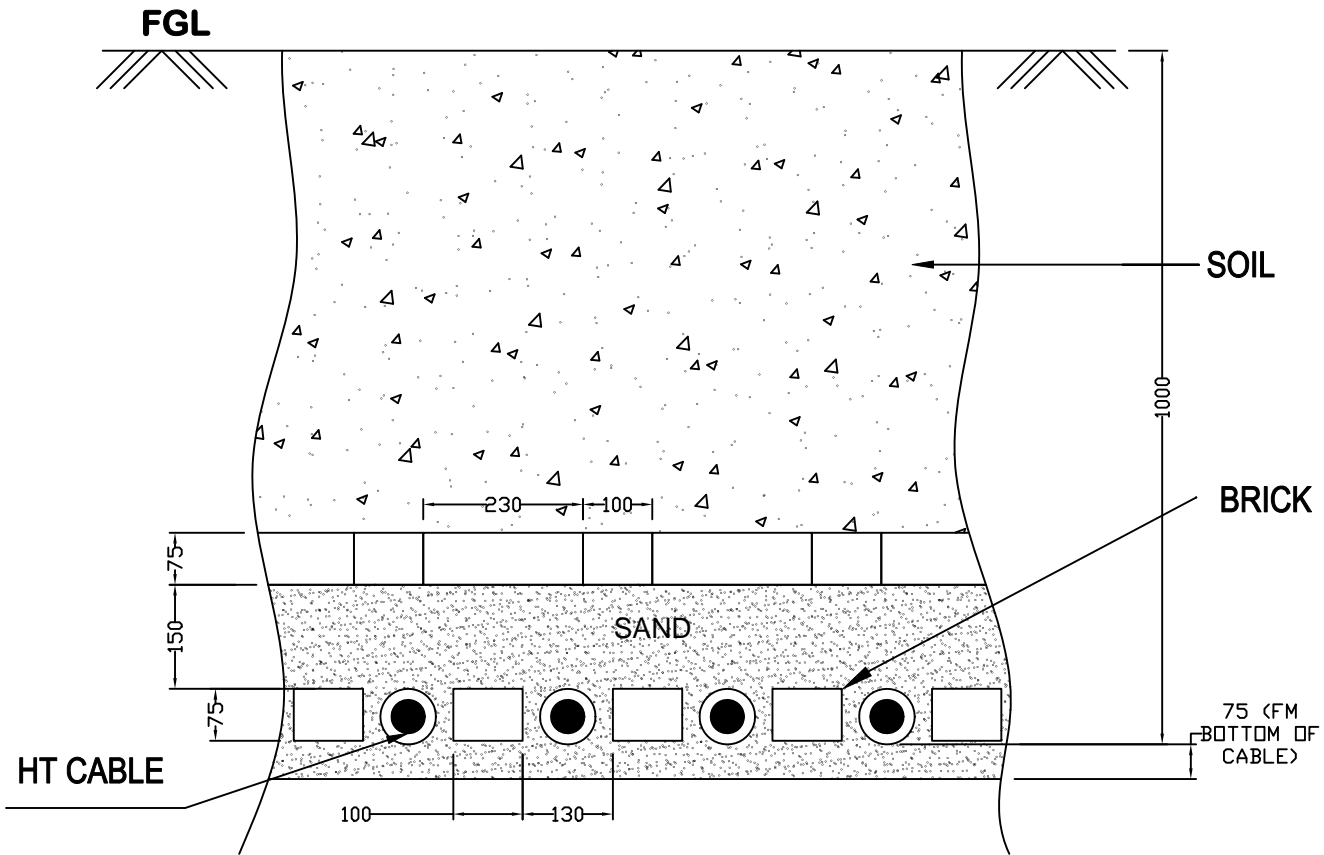
**LEGENDS ::**

- APFCR MICROPROCESSOR BASED APFC RELAY WITH RS 485
- A AMMETER
- V VOLTMETER
- ASS AMMETER SELECTOR SWITCH
- VSS VOLTMETER SELECTOR SWITCH
- THERMAL OVERCURRENT RELAY
- SHORT CIRCUIT / EARTH FAULT UNDER VOLTAGE RELEASE
- MCB/COUPLER/CIRCUIT BREAKER (ACB/VCB/SF6/MCCB)
- CAPACITOR DUTY CONTACTOR WITH AUXILIARY CONTACT
- CURRENT TRANSFORMER
- CAPACITOR BANK
- T ON DELAY TIMER
- T-MCCB THERMAL MAGNETIC MCCB
- TERMINAL (POWER / CONTROL)
- RED FOR STOP/OFF PUSH BUTTON
- GREEN FOR START/ON PUSH BUTTON
- INDICATION
- AUTO/MANUAL MODE SELECTRO SWITCH

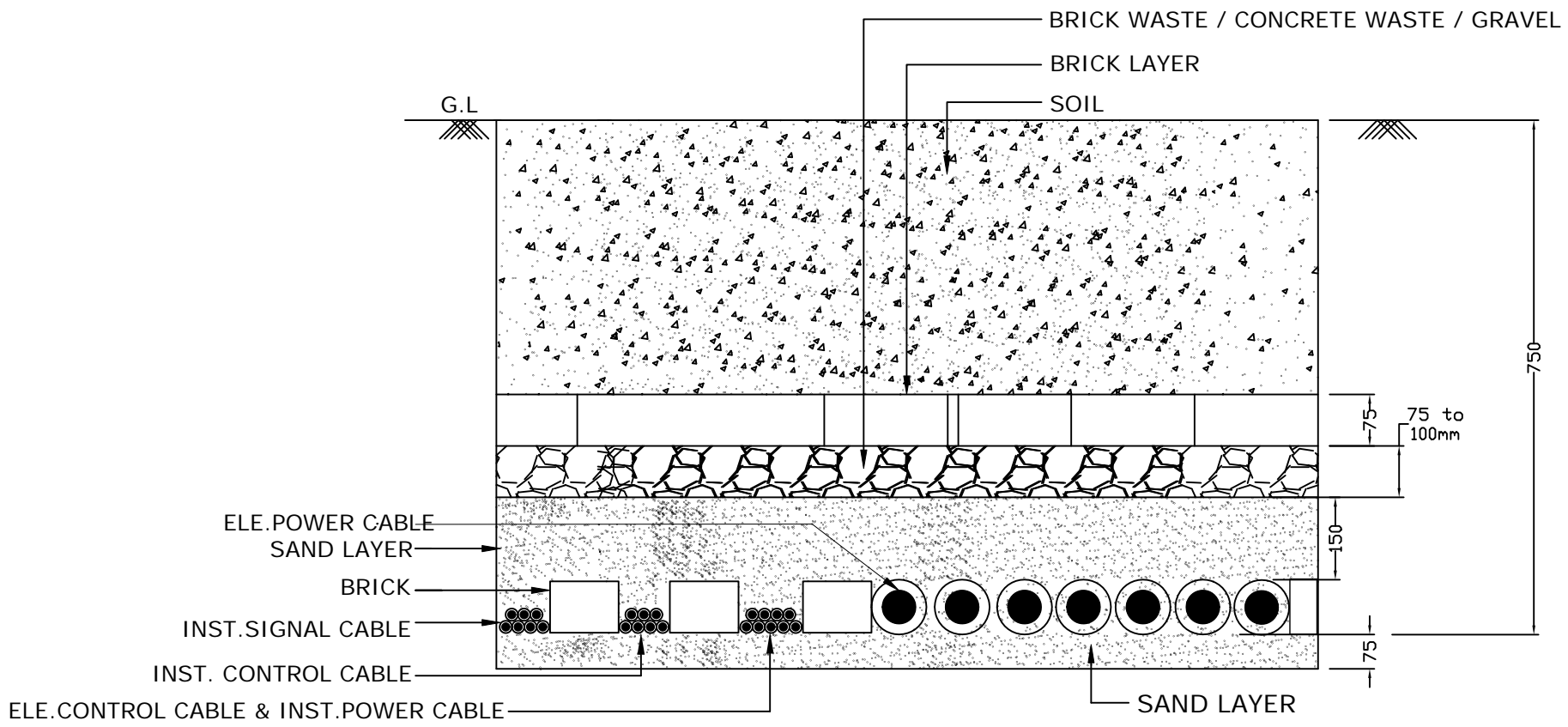
**NOTES :**

1. APFC RELAY SHALL BE WITH RS 485 AND CAPABLE OF SENSING 10% LOAD.
2. CAPACITORS SHALL BE SUPER HEAVY DUTY/ GAS FILLED HAVE LOSSES  $\leq 0.2$  W/kVAr.
3. NO. OF STEPS & RATING OF CAPACITOR BANK SHALL BE MIN. RATING. CONTRACTOR TO PROVIDE CONSIDERED MOTOR POWER FACTOR AND ACCORDINGLY P.F. CORRECTION UP TO 0.99
4. RATING OF BREAKER/CAPACITOR TO BE FINALISED BY VENDOR SUITABLE FOR CAPACITOR DUTY/RATING.
5. CONTACTOR FOR CAPACITOR SHALL BE CAPACITOR DUTY ONLY. MCCB SHALL BE D CURVE AND MCCB SHALL BE 50KA,  $I_{cs}=100\%$   $I_{cu}$  WITH THERMAL MAGNETIC RELEASE WITH ADJUSTABLE OVER CURRENT AND ADJUSTABLE SHORT CIRCUIT PROTECTION.
6. CAPACITOR FEEDERS SHALL BE COMPARTMENTALISED, MCCB TO BE OPERATED FROM DOOR.
7. TWO NUMBERS VACANT CAPACITOR FEEDERS SHALL BE PROVIDED.
8. EACH CAPACITOR BANK SHALL HAVE CAPACITOR DUTY CONTACTOR. i.e NOT MORE THAN ONE CAPACITOR BANK SHALL BE CONNECTED TO CONTACTOR TERMINAL.
9. COOLING/EXHAUST FAN : HEAVY DUTY 8" METALIC HOUSING AND METAL IMPELLER / BLADE / VANES OF MINIMUM 2 NOS. OR HIGHER AS REQUIRED AT THE TOP OF THE PANEL WITH CANOPY/HOOD.
10. FOR CAPACITOR OF  $\leq 5$  kVAr RATING (ONLY), ALL TYPE VIZ. APP/ MPP/GAS FILLED ARE ACCEPTABLE.

R0	12.01.2024	TENDER PURPOSE ONLY	APP	RVS
REV.	DATE	DESCRIPTION	REV. BY	CHK. BY
PROJECT: SEWAGE PUMPING STATION-02 AT GHANTESHWAR OF RMC				
CLIENT: RAJKOT MUNICIPAL CORPORATION, RAJKOT				
CONSULTANTS: multi media consultants pvt. ltd. 401, Shivalik Shilp, Iskon Cross Road, S.G. Highway, Ahmedabad - 380 054.				
ASSOCIATE CONSULTANTS: SAPIENT TECHNO CONSULTANTS 701, Rembrandt, Opp. Associated Petrol Pump, C.G.Road, Ellisbridge, Ahmedabad-380 006 E-mail : sapient_ahd@sapient.net.in				
TITLE: LT PMCC SINGLE LINE DIAGRAM (SHEET 4 OF 4)				
DRAWN BY : ARJ		DESIGNED BY : APP		
CHECKED BY : APP		PROJ. NO. :		
SCALE : NTS		DRG. NO. : STC/RMC/SPS-02/G/E-02B		
DATE : 12.01.2024		REVISION : R0		

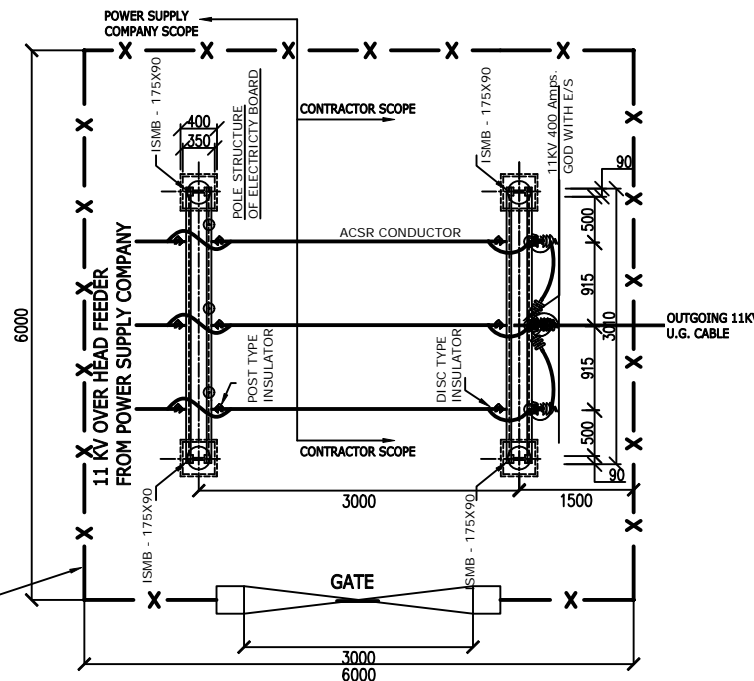
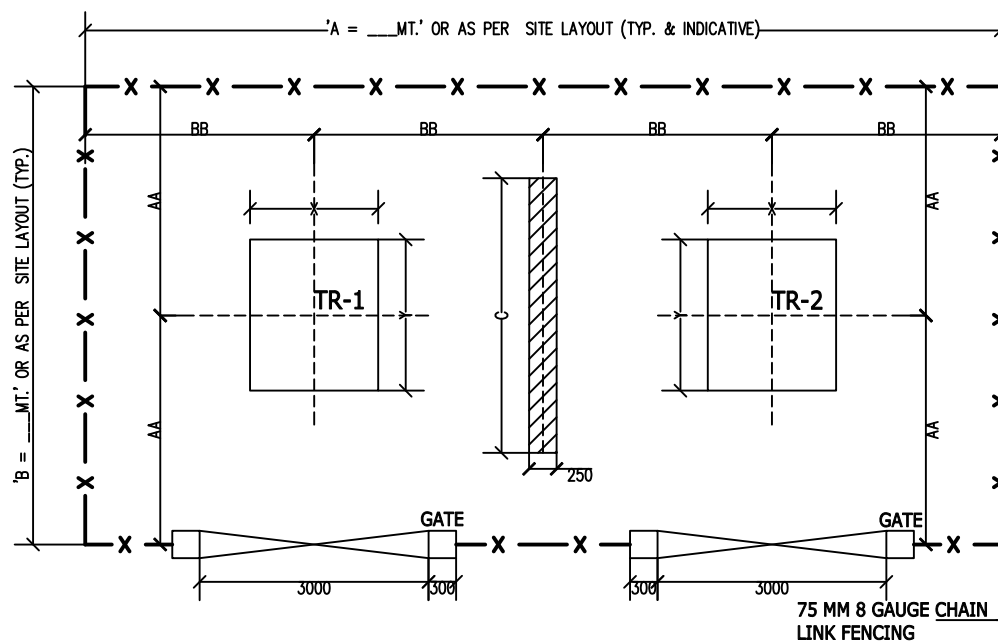


**HT CABLE BURIED IN GROUND TYPE-1  
BRICK PROTECTION ON TOP**



**TYPICAL LAYING DETAILS FOR LT CABLES BURIED IN GROUND**

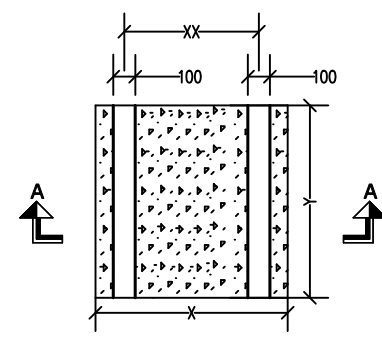
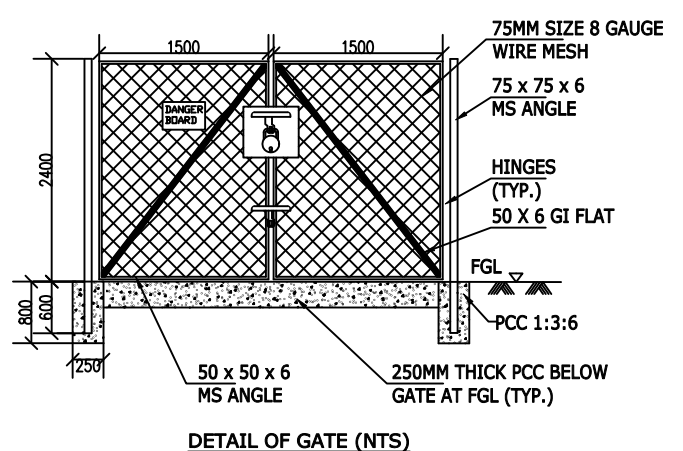
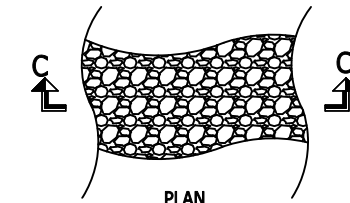
R0	12.01.2024	TENDER PURPOSE ONLY	APP	RVS
REV.	DATE	DESCRIPTION	REV. BY	CHK. BY
PROJECT: SEWAGE PUMPING STATION (SPS-01/02) AT GHANTESHWAR OF RMC				
CLIENT: RAJKOT MUNICIPAL CORPORATION, RAJKOT				
CONSULTANTS: <b>multi media consultants pvt. ltd.</b> 401, Shivalik Shlp, Iskon Cross Road, S.G. Highway, Ahmedabad - 380 054.				
ASSOCIATE CONSULTANTS: <b>SAPIENT TECHNO CONSULTANTS</b> 701, Rembrandt, Opp. Associated Petrol Pump, C.G.Road, Ellisbridge, Ahmedabad-380 006 E-mail : sapient_ahd@sapient.net.in				
TITLE: HT AND LT CABLE LAYING DETAILS (SHEET 1 OF 4)				
DRAWN BY : ARJ		DESIGNED BY : APP		
CHECKED BY : APP		PROJ. NO. :		
SCALE : NTS		DRG. NO. : STC/RMC/SPS/G/E-08		
DATE : 12.01.2024		REVISION : R0		



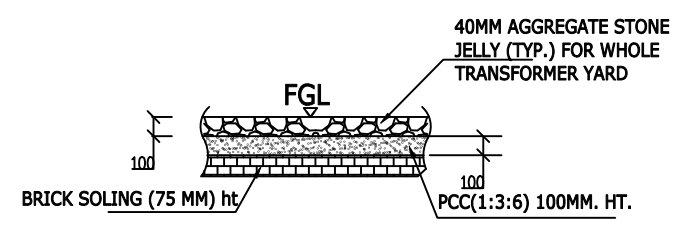
NOTE :-

- (1) FIRE PROTECTION WALL SHALL BE 0.25M THICK AND HEIGHT EQUAL TO THE MAX. HEIGHT OF TRANSFORMER ABOVE PLINTH LEVEL.
- (2) THE MS CHANNEL SHALL BE IN CEMENT CONCRETE FOUNDATION IN 1:4:8.
- (3) CAUTION NOTICE SHOULD BE FIXED ONE EACH AT FOLLOWING AS A MIN.:  
- AT SUITABLE LOCATION NEAR TRANSFORMER  
- ON THE GATE.
- (4) ALL WORK SHALL BE CARRIED OUT BY CONTRACTOR AS PER STATUTORY REQUIREMENT OVER & ABOVE THE DETAILS FURNISHED IN THIS DRAWING.
- (5) FENCING & GATES SHALL BE EARTHED PROPERLY COVERING ALL ROWS ON ALL SIDES AS PER IS; 3043 & STATUTORY NORMS.
- (6) PROVIDE 10 MM THICK 1:6 CEMENT PLASTER ON FAIR FACES OF TRANSFORMER FOUNDATION ABOVE FGL.
- (7) TRANSFORMER DETAILS LIKE NAME OF THE MANUFACTURER, RATING, YEAR OF MANUFACTURER & DATE OF ENERGISATION SHALL BE PAINTED ON TRANSFORMER FIRE WALL FOR BOTH THE TRANSFORMER.
- (8) TWO COATS OF ALUMINIUM PAINT OVER A COAT OF ALUMINIUM PRIMER SHALL BE APPLIED ON FENCING POST AND GATE. FINAL ONE COAT OF PAINT SHALL BE APPLIED AFTER COMPLETION OF WORK AT SITE AT THE TIME OF HANDING OVER.
- (9) TRANSFORMER YARD AND TWO POLE SWITCH YARD LOCATION SHALL BE AS PER SITE CONDITIONS.

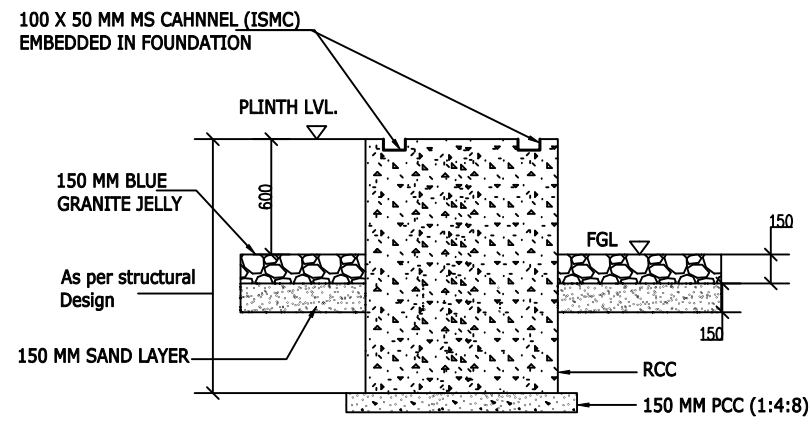
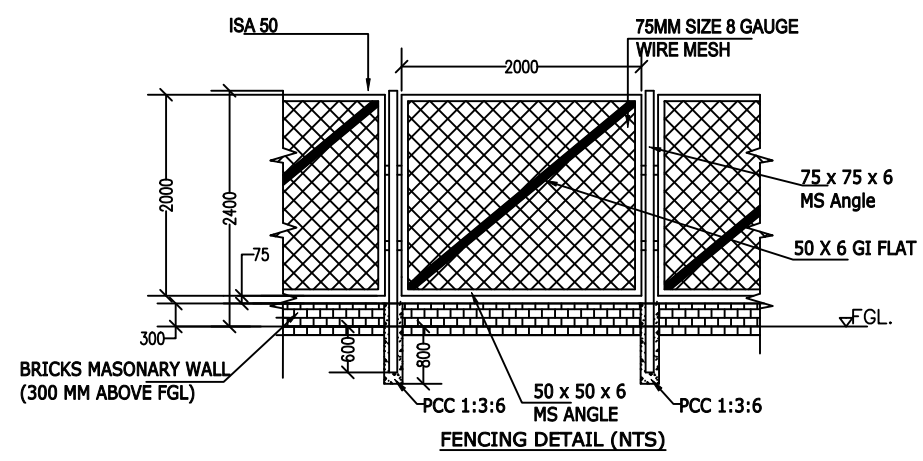
A = AS PER SITE  
 B = AS PER SITE  
 C = 3 MT. OR HIGHER  
 AA=AA=AS PER SITE  
 BB=BB=AS PER SITE



X = \_\_ MM.  
 Y = \_\_ MM.  
 XX = \_\_ MM.



SECTION C  
 DETAIL-C FOR TRANSFORMER YARD



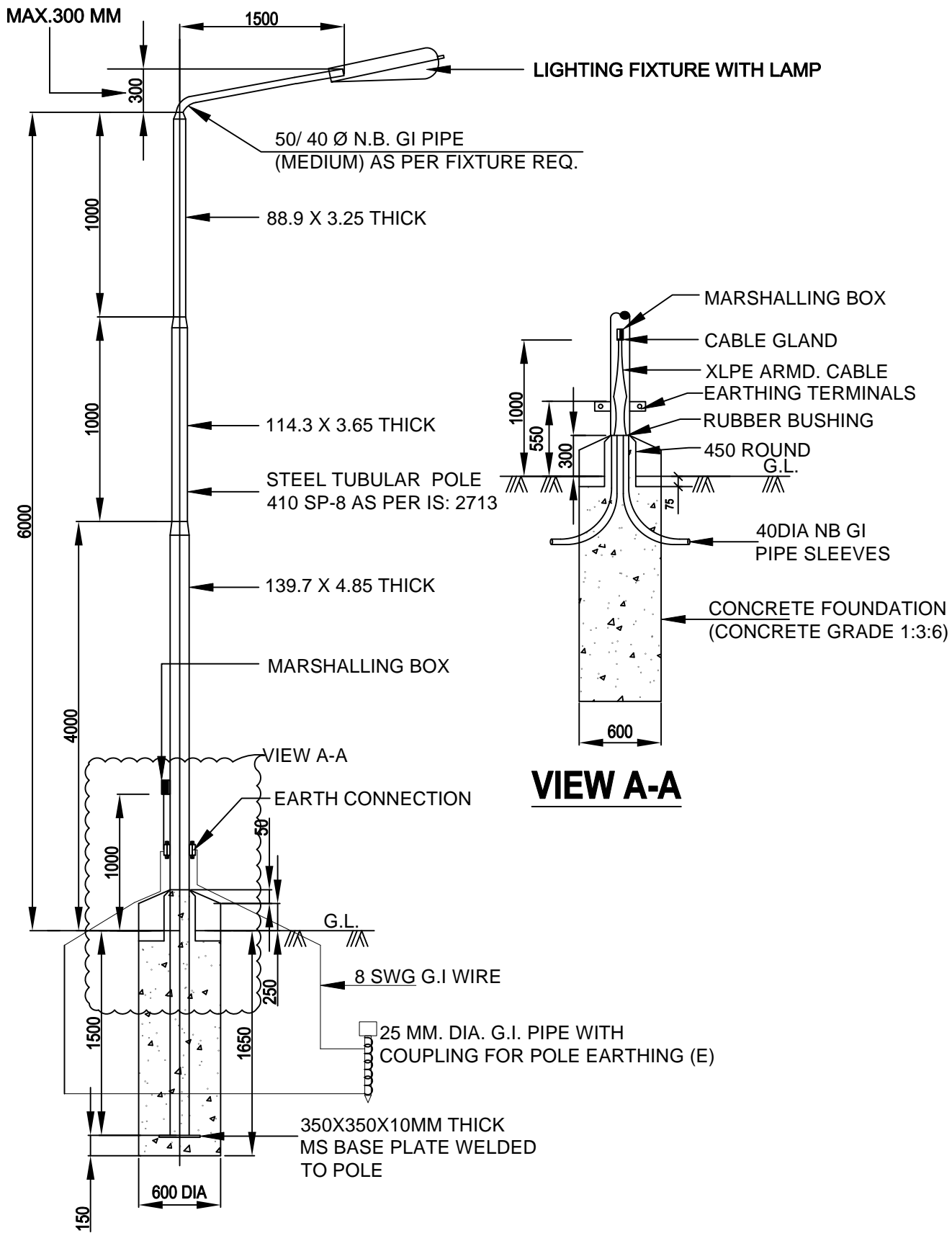
SECTION A-AA-A

REMARKS :-

- (1) TRANSFORMER LOCATION SHALL BE AS PER SITE REQUIREMENT.

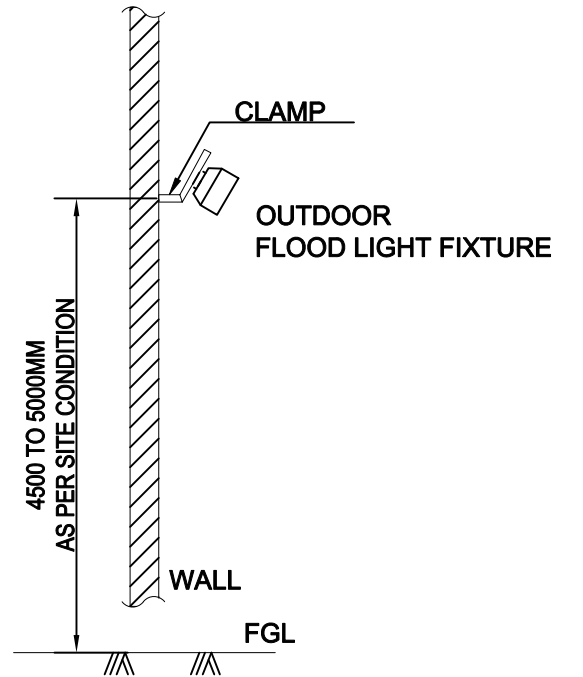
R0	12.01.2024	TENDER PURPOSE ONLY	APP	RVS
REV.	DATE	DESCRIPTION	REV. BY	CHK. BY
PROJECT: SEWAGE PUMPING STATION (SPS-01/02) AT GHANTESHWAR OF RMC				
CLIENT: RAJKOT MUNICIPAL CORPORATION, RAJKOT				
CONSULTANTS: multi media consultants pvt. ltd. 401, Shivalik Shilp, Iskcon Cross Road, S.G. Highway, Ahmedabad - 380 054.				
ASSOCIATE CONSULTANTS: SAPIENT TECHNO CONSULTANTS 701, Rembrandt, Opp. Associated Patrol Pump, C.G.Road, Ellisbridge, Ahmedabad-380 006 E-mail -> sapient_ahd@sapient.net.in				
TITLE: TRANSFORMER YARD & FENCING DETAILS				
(SHEET 1 OF 4)				
DRAWN BY	: ARJ	DESIGNED BY	: APP	
CHECKED BY	: APP	PROJ. NO.	:	
SCALE	: NTS	DRG. NO.	: STC/RMC/SPS/G/E-05	
DATE	: 12.01.2024	REVISION	: R0	

# TYPICAL INSTALLATION OF STREET LIGHT FIXTURE





**VIEW A-A**

## TYPICAL WALL MOUNTING FLOOD LIGHT FIXTURES



## 7.5M HEIGHT STREET LIGHT POLE (6M HIGH ABOVE GROUND LEVEL)

R0	12.01.2024	TENDER PURPOSE ONLY	APP	RVS
REV.	DATE	DESCRIPTION	REV. BY	CHK. BY
PROJECT: SEWAGE PUMPING STATION (SPS-01/02) AT GHANTESHWAR OF RMC				
CLIENT: RAJKOT MUNICIPAL CORPORATION, RAJKOT				
CONSULTANTS:  multi media consultants pvt. ltd. 401, Shivalik Shilp, Iskcon Cross Road, S.G. Highway, Ahmedabad - 380 054.				
ASSOCIATE CONSULTANTS:  SAPIENT TECHNO CONSULTANTS 701, Rembrandt, Opp. Associated Petrol Pump, C.G.Road, Ellisbridge, Ahmedabad-380 006 E-mail :- sapient_ahd@sapient.net.in				
TITLE: TYPICAL STREET LIGHT POLE DETAILS (SHEET 1 OF 4)				
DRAWN BY : ARJ		DESIGNED BY : APP		
CHECKED BY : APP		PROJ. NO. :		
SCALE : NTS		DRG. NO. : STC/RMC/SPS/G/E-10		
DATE : 12.01.2024		REVISION : R0		