

BHEL:BAP:RANIPET
CIVIL PROJECTS & SERVICES
ANNEXURE TO CORRIGENDUM

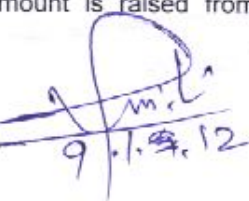
Name of work: Consultancy work for Design, Detailed engineering & submission of construction drawings for desalination projects.

Tender Notice No. 27/2011-12

NIT_11078

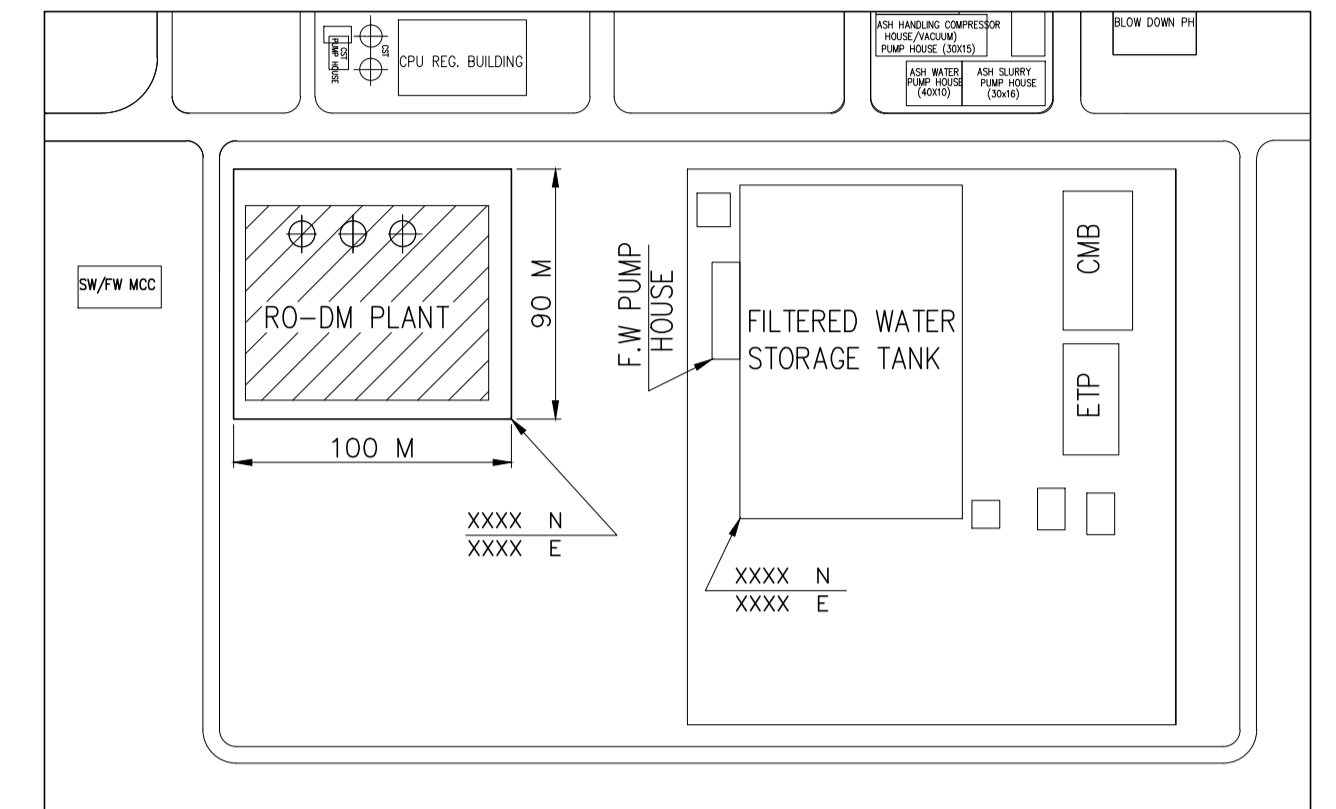
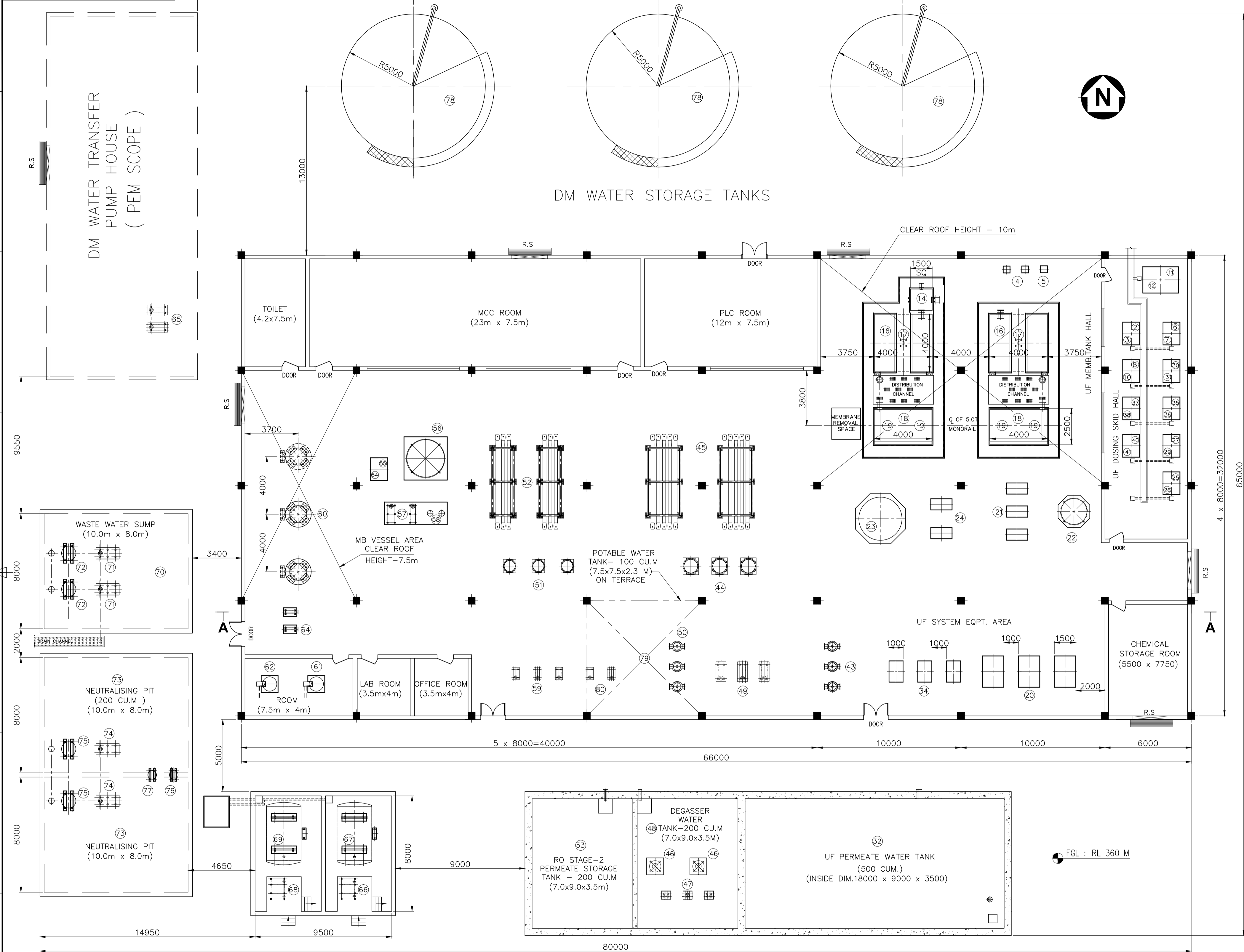
1. BHEL reserves the right to split the work as per the combination detailed below considering the urgency of the projects:
 - a. If any three parties become L1 in each of the projects viz. RPCL-Yermarus, KPCL Bellary-III & PPCL- Bumnauli individually, individual party will be awarded with the respective work in which the party is L-1.
 - b. If a single party becomes the lowest tenderer (L1) in each of the above three projects, then RPCL-Yermarus & PPCL- Bumnauli will be awarded to the L-1 party at BHEL's discretion and for the 3rd project (i.e KPCL Bellary – III), L-1 rate will be counter offered to L-2, L-3.....of KPCL, Bellary on seriatim basis. In case the L-2, L-3.....bidders are not agreeable for this counter offered L-1 rate, then the L-1 bidder himself will be ordered with the third work also.
 - c. If a party becomes the lowest tenderer (L1) for KPCL Bellary – III & PPCL- Bumnauli individually, and another party becomes L-1 for RPCL-Yermarus, orders will be placed as such.
 - d. If a party becomes the lowest tenderer (L1) for RPCL-Yermarus & PPCL- Bumnauli individually and another party becomes L-1 for KPCL Bellary – III, orders will be placed as such.
 - e. If any party becomes the lowest tenderer (L1) in RPCL-Yermarus & KPCL Bellary III individually, then the bidder will be ordered with RPCL – Yermarus only and the L-1 rate of the project KPCL Bellary - III will be counter offered to L-2, L-3.....of KPCL, Bellary on seriatim basis. In case the L-2, L-3.....bidders are not agreeable for this counter offered L-1 rate, then the L-1 bidder himself will be ordered with the KPCL, Bellary. The third work PPCL – Bamnauli will be ordered with the L-1 party for that project.
2. The last item given in the Bill of Quantities of KPCL – Bellary III is for Architectural service for plant building alone and the value of Rs. 1,50,000/- is mentioned inadvertently you may please ignore.
3. Projects site are located as detailed below:
 - i. KPCL – Yermarus near Raichur in Karnataka
 - ii. KPCL – Bellary III in Karnataka
 - iii. PPCL – Bamnauli near Delhi
4. Consultants offices are located as detailed below:
 - i. KPCL – Yermarus & KPCL – Bellary III in Bangalore, Karnataka
 - ii. PPCL – Bamnauli near Delhi, Noida.
5. Maximum 2 site visits & 3 consultant's office visits of a designer are included in the scope. Beyond which, based on requirement 2-tier A.C train fare / Economy Air fare and Rs. 2500/- will be paid as extra per visit.
6. The Earnest Money Deposit amount is raised from Rs. 50,000/- to Rs. 1,00,000/- due to administrative reason.


AGM / Civil Projects & Services


9.1.12

1-BW-220-00448
DRAWING NO.

ALL DIMENSIONS ARE IN MILLIMETRES
FOR PRODUCTION
REF. PR-QA-500 FOR PAINTING
REF. PR-QA-500 FOR UNTOL. DIMS.
REF. APPLICABLE GMS FOR MATCODESPEC.



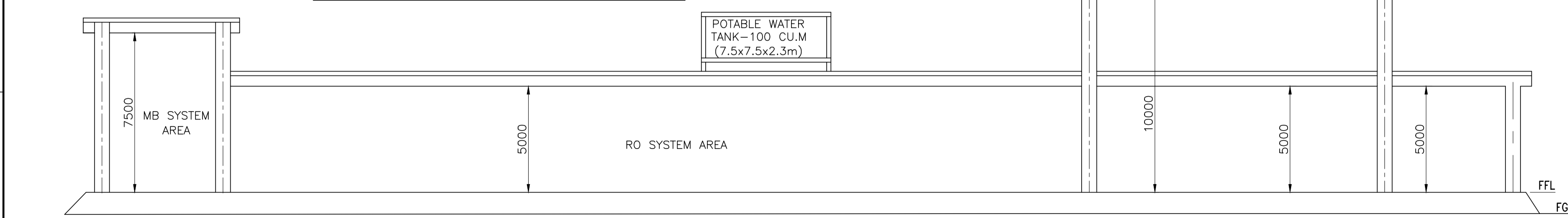
KEY PLAN

EQUIPMENT LIST:-

| EQPT. NO | DESCRIPTION | QUANTITY | ZONE | EQPT. NO | DESCRIPTION | QUANTITY | ZONE |
|----------|--|----------|------|----------|---|----------|------|
| 01 | FILTERED WATER PUMPS | 3(2W+1S) | | 41 | SMBS DOSING PUMP | 2(1W+1S) | C-2 |
| 02 | NaOCl DOSING TANK FOR PRETREATMENT | 1 | C-2 | 42 | AGITATOR FOR SMBS DOSING TANK | 1 | |
| 03 | NaOCl DOSING PUMP FOR PRETREATMENT | 2(1W+1S) | C-2 | 43 | RO-01 CARTRIDGE FILTER | 3(2W+1S) | D-4 |
| 04 | AUTO SELF CLEANING STRAINER | 2(2W) | B-3 | 44 | RO-01 HIGH PRESSURE PUMP | 3(2W+1S) | D-5 |
| 05 | MANUAL SELF CLEANING STRAINER | 1 | B-3 | 45 | RO BLOCK-(STAGE-1) | 2W | D-4 |
| 06 | HCL DOSING TANK FOR PRETREATMENT | 1 | C-2 | 46 | DEGASSER TOWER | 2W | F-4 |
| 07 | HCL DOSING PUMP FOR PRETREATMENT | 2(1W+1S) | C-2 | 47 | DEGASSER AIR BLOWER | 3(2W+1S) | F-4 |
| 08 | KMnO4 DOSING TANK | 1 | C-2 | 48 | DEGASSER WATER TANK | 1 | |
| 09 | AGITATOR FOR KMnO4 DOSING TANK | 1 | | 49 | RO-2 STAGE-2 FEED PUMP | 3(2W+1S) | |
| 10 | KMnO4 DOSING PUMPS | 2(1W+1S) | C-2 | 50 | RO-2 CARTRIDGE FILTER | 3(2W+1S) | D-5 |
| 11 | FERRIC CHLORIDE DOSING TANK | 1 | B-2 | 51 | RO-2 HIGH PRESSURE PUMP | 3(2W+1S) | F-4 |
| 12 | AGITATOR FOR FERRIC CHLORIDE DOSING TANK | 1 | B-2 | 52 | RO BLOCK-(STAGE-2) | 2 | D-6 |
| 13 | FERRIC CHLORIDE DOSING PUMPS | 2(1W+1S) | | 53 | RO-2 PERMEATE STORAGE TANK | 1 | F-5 |
| 14 | FLASH MIXER TANK | 1 | B-3 | 54 | NaOH DOSING TANK FOR RO-2 PERMEATE | 1 | |
| 15 | FLASH MIXER | 1 | | 55 | NaOH DOSING PUMP FOR RO-2 PERMEATE | 2(1W+1S) | |
| 16 | FLOCCULATOR TANK | 2 | C-3 | 56 | CHEMICAL CLEANING TANK | 1 | D-5 |
| 17 | FLOCCULATOR | 2 | C-3 | 57 | CIP PUMP | 2(1W+1S) | D-6 |
| 18 | MEMBRANE TANK - 40 CU.M | 2 | C-3 | 58 | CIP MICRON CARTRIDGE FILTER | 1 | D-6 |
| 19 | UF MEMBRANES | 4 | C-3 | 59 | MB FEED PUMP | 3(2W+1S) | E-6 |
| 20 | MEMBRANE AIR BLOWERS | 3(2W+1S) | E-2 | 60 | MIXED BED UNIT | 3(2W+1S) | E-7 |
| 21 | PERMEATE/BACKPULSE PUMP | 3(2W+1S) | D-3 | 61 | ACID MEASURING TANK | 1 | E-6 |
| 22 | BACKPULSE TANK | 1 | D-3 | 62 | ALKALI MEASURING TANK | 1 | E-7 |
| 23 | CIP TANK | 1 | D-3 | 63 | AGITATOR FOR ALKALI MEASURING TANK | 1 | |
| 24 | CIP/DRAIN PUMPS | 2(1W+1S) | D-3 | 64 | MB AIR BLOWER | 2(1W+1S) | E-7 |
| 25 | SODIUM HYPOCHLORITE DOSING TANK | 1 | D-1 | 65 | MB REGENERATION PUMPS | 2(1W+1S) | |
| 26 | SODIUM HYPOCHLORITE DOSING PUMP | 2(1W+1S) | D-1 | 66 | ACID UNLOADING PUMPS | 2(1W+1S) | F-7 |
| 27 | CITRIC ACID DOSING TANK | 1 | C-1 | 67 | BULK ACID STORAGE TANK | 1 | F-7 |
| 28 | AGITATOR FOR CITRIC ACID DOSING PUMP | 1 | | 68 | ALKALI UNLOADING PUMP | 2(1W+1S) | F-7 |
| 29 | CITRIC ACID DOSING PUMP | 2(1W+1S) | C-1 | 69 | BULK ALKALI STORAGE TANK | 1 | F-7 |
| 30 | HCL DOSING TANK FOR UF PLANT | 1 | C-1 | 70 | WASTE WATER SUMP | 1 | D-8 |
| 31 | HCL DOSING PUMP FOR UF PLANT | 2(1W+1S) | C-1 | 71 | WASTE WATER DISPOSAL PUMPS | 2(1W+1S) | D-8 |
| 32 | UF PERMEATE STORAGE TANK | 1 | F-2 | 72 | PRIMING CHAMBER | 2(1W+1S) | D-8 |
| 33 | ELECTRICAL HOIST | 1 | C-3 | 73 | NEUTRALISING PIT | 2 | E-8 |
| 34 | RO-1 FEED PUMP | 3(2W+1S) | E-3 | 74 | NEUTRALISED WATER TRANSFER PUMP | 2(1W+1S) | E-8 |
| 35 | HCL DOSING TANK FOR RO-1 FEED | 1 | C-1 | 75 | PRIMING CHAMBER | 2 | E-8 |
| 36 | HCL DOSING PUMP FOR RO-1 FEED | 2(1W+1S) | C-1 | 76 | ACID DOSING TANK FOR NEUTRALIZATION PIT | 1 | E-8 |
| 37 | ANTISCALANT DOSING TANK | 1 | C-2 | 77 | ALKALI DOSING TANK FOR NEUTRALIZATION PIT | 1 | E-8 |
| 38 | ANTISCALANT DOSING PUMP | 2(1W+1S) | C-2 | 78 | DM WATER TANK | 3 | B-7 |
| 39 | AGITATOR FOR ANTISCALANT DOSING TANK | 1 | | 79 | POTABLE WATER TANK | 1 | F-5 |
| 40 | SMBS DOSING TANK | 1 | C-2 | 80 | POTABLE WATER PUMP | 2(1W+1S) | E-5 |

REF. DRAWING:
1. PLOT PLAN :- RPCL-YTPS-LAYOUT-001 SH.1/1 REV.00 - DT.28.02.2011

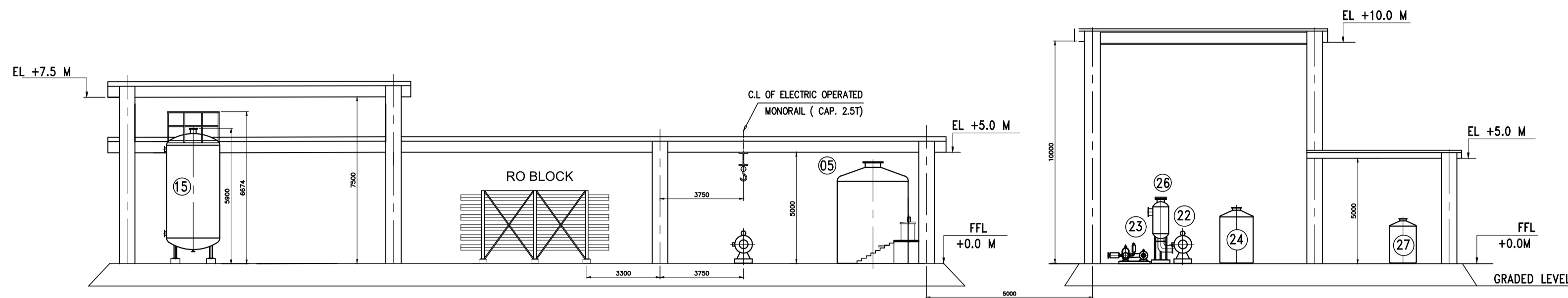
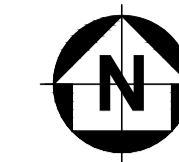
PLANT EQUIPMENT LAYOUT - PLAN



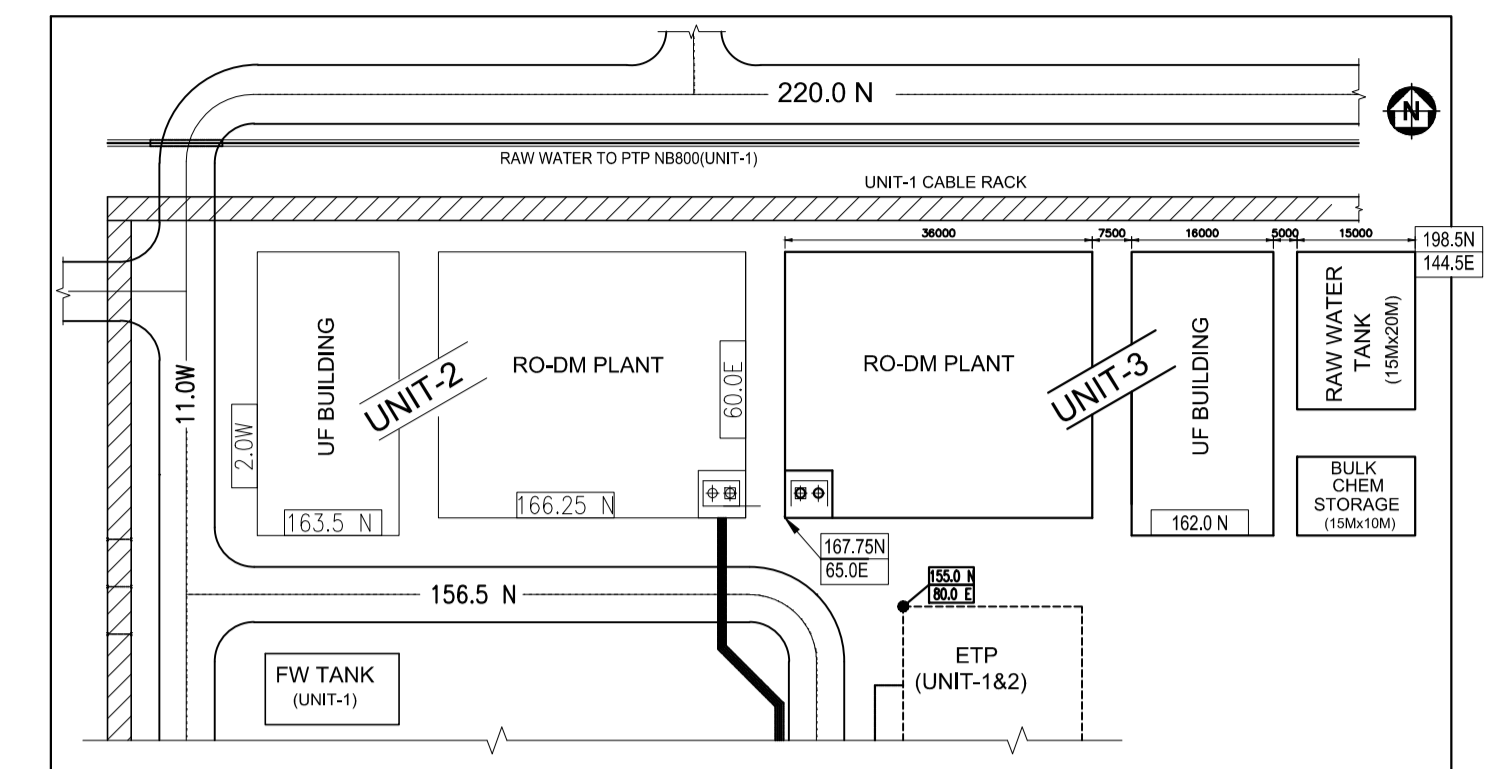
SECTION - AA

PRELIMINARY

| | | | | | |
|---|-------------|---|-----------------------|----------|--------------|
| TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT | | RO-DM PLANT M/s RPCL - YERMARUS 2x800 MW | | | |
| Bharat Heavy Electricals Ltd., Unit: Boiler Auxiliaries Plant, Ranipet - 632 406. | | DRN | NAME | SIGN | DATE |
| DEPT: FANS | | CHD | GR | SK | 06.08.11 |
| GRADE OF UNTOL.DIM: PR:QA:500 | | APPD | SK | | 06.08.11 |
| SCALE | WEIGHT (KG) | REF. TO ASSY/OLD DRG. | | ITEM NO. | NO. OF ITEMS |
| | | | | | |
| TITLE | | CARD CODE | DRAWING NO. | | REV |
| RO-DM PLANT EQUIPMENT LAYOUT | | U 01 | 1-BW-220-00448 | | 0 |



SECTION - AA
(E-2)

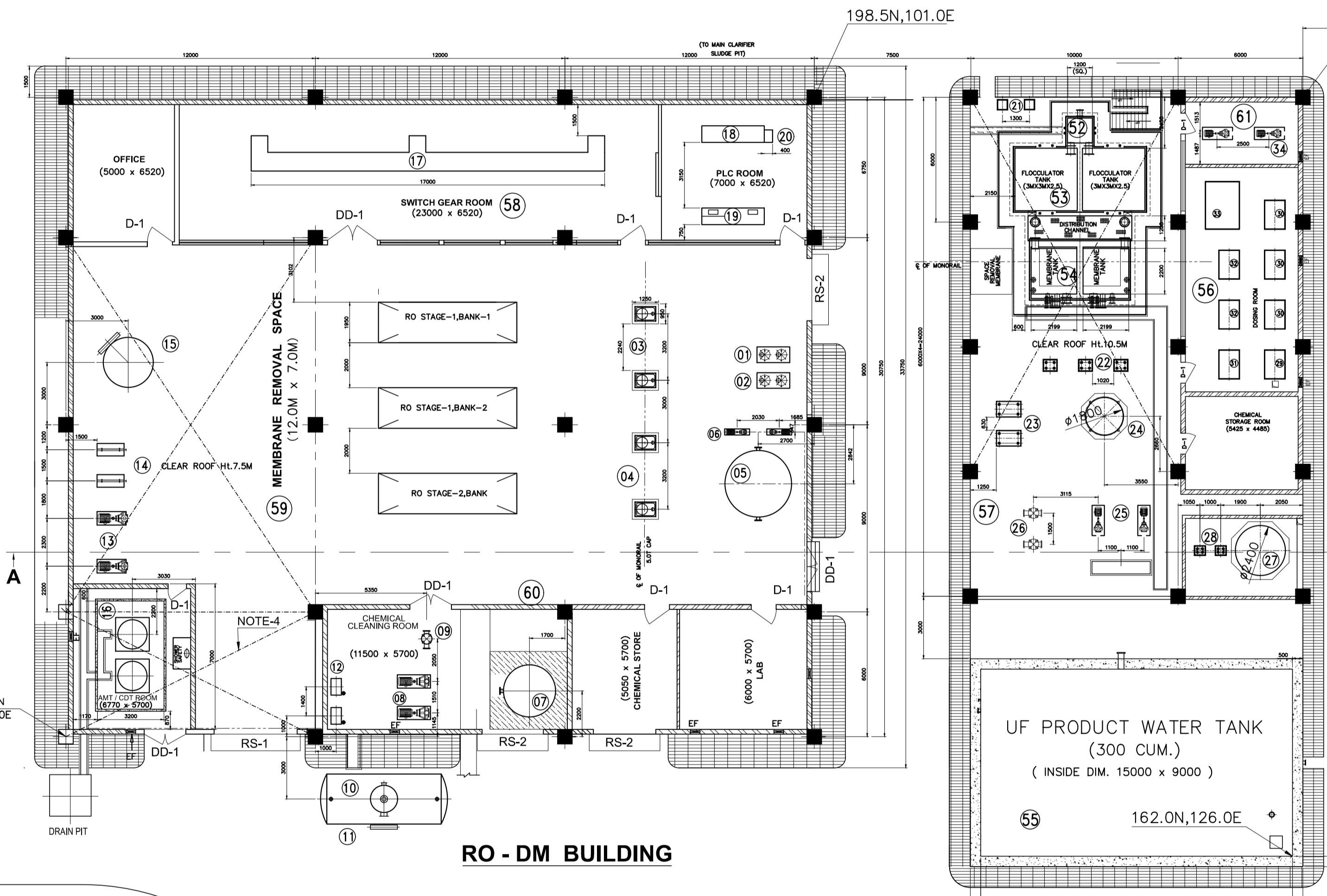


RO - DM EQUIPMENT DETAILS
 RO - DM BUILDING

| EQPT. NO | DESCRIPTION | QTY. | APPROX. SIZE IN (LxWxH) | LOCATION CO-ORDINATES |
|----------|---|-----------|---------------------------|-----------------------|
| 01 | ANTISCALANT DOSING SYSTEM (PREPARATION / DOSING TANK) | 1NO. EACH | 750x750x800 (SKID DIM.) | E-5 |
| 02 | DECHLORINATION(SBS) DOSING SYSTEM (PREPARATION / DOSING TANK) | 1NO. EACH | 750x750x800 (SKID DIM.) | E-5 |
| 03 | HIGH PRESSURE PUMPS(STAGE-1) | 2 | 1250x950 | E-4 |
| 04 | HIGH PRESSURE PUMPS(STAGE-2) | 2 | 1250x950 | E-4 |
| 05 | INT.PER. STORAGE TANK | 1 | Ø3100x3525H | E-4 |
| 06 | PERMEATE WATER PUMPS | 2 | 1150x450 | E-4 |
| 07 | CHEMICAL CLEANING TANK | 1 | Ø2500x2650H | F-4 |
| 08 | CHEMICAL CLEANING PUMPS | 2 | 1600x700 | F-3 |
| 09 | CC FILTER | 1 | Ø508x2871H | F-3 |
| 10 | DEGASSER TOWER | 1 | Ø1300x3300H | F-3 |
| 11 | DEGASSED WATER TANK | 1 | Ø2400x5000L | F-3 |
| 12 | DEGASSER BLOWERS | 2 | 800x500 | F-3 |
| 13 | MB FEED PUMPS | 2 | 1550x565 | E-2 |
| 14 | MB BLOWERS | 2 | 1300x855 | E-2 |
| 15 | MIXED BED | 1 | Ø2400x3200H | E-2 |
| 16 | ACID/ ALKALI MEASURING TANKS | 1ST | Ø1400x1200H / Ø1400x1600H | F-2 |
| 17 | LTCC PANEL | 1 | 17000x1300 / 900x2400 | D-4 |
| 18 | PLC PANEL | 1 | 3000x800x2100 | D-5 |
| 19 | CONTROL DESK | 1 | 3000x800x1600 | D-5 |
| 20 | UPS | 1 | 400x600x1200 | D-5 |
| XX | CHLORINE CONTACT TANK PUMP | 1 | | |

UF SYSTEM BLDG.

| EQPT. NO | DESCRIPTION | QTY. | APPROX. SIZE IN (LxWxH) | LOCATION CO-ORDINATES |
|----------|--------------------------------|------|-------------------------|-----------------------|
| 21 | SELF CLEANING STRAINERS | 2 | 500x500 | C-6 |
| 22 | UF PERMEATE / BACK PULSE PUMPS | 3 | 680x575 | D-6 |
| 23 | UF AIR BLOWERS | 2 | 1200x771 | E-6 |
| 24 | BACKPULSE TANK | 1 | Ø1800x2500 | E-6 |
| 25 | FILTERED WATER PUMPS | 2 | 1450x590 | E-6 |
| 26 | CARTRIDGE FILTERS | 2 | Ø508x2871H | E-6 |
| 27 | CIP TANK | 1 | Ø2400x2600H | E-7 |
| 28 | CIP/DRAIN PUMPS | 2 | 540x470 | E-7 |
| 29 | CITRIC ACID DOSING SYSTEM | 1 | 1400x1100 | D-7 |
| 30 | HCL DOSING SYSTEM | 3 | 1400x1100 | D-7 |
| 31 | KMnO4 DOSING SYSTEM | 1 | 1400x1100 | D-7 |
| 32 | NaOCl DOSING SYSTEM | 2 | 1400x1100 | D-7 |
| 33 | COAGULANT DOSING SYSTEM | 1 | 2300x1650 | D-7 |
| 34 | RAW WATER PUMP | 1 | 1450x590 | E-7 |



RO - DM BUILDING

UF SYSTEM BLDG.

PLAN

REFERENCE DRG.

1. UF,RO-DM PLANT ROOM EQPT. LAYOUT (UNIT-II)
2. BTPS PLOT PLAN
3. RO DM PLANT LAYOUT

NOTES :

1. TANK AND BUILDING DIMENSION FURNISHED ARE PRELIMINARY.
2. ALL EQUIPMENT LOCATION AND DIMENSION INDICATED ARE TENTATIVE
3. TANK CAPACITY INDICATED ARE EFFECTIVE / USABLE VOLUME
4. PRODUCT WATER TANK (10MX5MX1.5M)OF USABLE VOL. OF 50 CU.M TO BE BUILT ON THE ROOF. THE CROSS BEAM HAVE TO BE DESIGNED ACCORDINGLY

CIVIL BUILDING / TANK DETAILS

| EQPT. NO | DESCRIPTION | QTY. | APPROX. SIZE IN (LxWxH) | LOCATION CO-ORDINATES |
|----------|---|------|---|-----------------------|
| 51 | RAW WATER STORAGE TANK | 1 | 20Mx15MX4M | D-8 |
| 52 | FLASH MIXER | 1 | 1.5MX1.5X2M | D-6 |
| 53 | FLOCCULATION TANK | 2 | 3.0MX3.0X2.5M | D-6 |
| 54 | MEMBRANE HOLDING TANK | 2 | 2.5MX2.0X4.0M | D-6 |
| 55 | UF PRODUCT WATER TANK | 1 | 15MX9.0MX3.2M | F-6 |
| 56 | UF SYSTEM BLOCK FOR DOSINGSYSTM CHEM.STORE/CC SYSTEM | 1 | 6MX12MX5M (DOSING & STORE AREA) | D-7 |
| 57 | UF SYSTEM BLOCK FOR UF MEMBRANE TANK & TRANSFER PUMPS | 1 | 10MX18MX10M | D-6 |
| 58 | PLC, SWITCH GEAR & OFFICE BUILDING | 1 | 36MX6.75MX5.0M | D-4 |
| 59 | RO-DM BUILDING | 1 | 24MX18MX5M (RO AREA) 12MX18MX7.5M (MB AREA) | E-4 |
| 60 | RO BUILDING FOR CC SYSTEM, CC STORE, AMT&CDT & LAB | 1 | 36MX6MX5M | F-4 |
| 61 | RAW WATER PUMP HOUSE | 1 | 6MX3MX5M | C-7 |



ROLLING SHUTTERS
(WIDTH x CLEAR HT)

1. RS-1 4000 x 6000
2. RS-2 3000 x 3500

DOORS - W x Ht.

1. DD-1 2100 X 3000(2100+900)
2. D- 1 800 X 2100

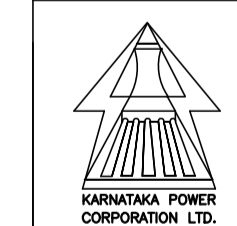
ACID RESISTANT TILED AREA

PIPE LINE

EF - EXHAUST FAN

PRELIMINARY

CUSTOMER NO. R701



KARNATAKA POWER CORPORATION LIMITED
BELLARY THERMAL POWER STATION
STAGE-III (1x700MW)



BHARAT HEAVY ELECTRICALS LTD
UNIT : BOILER AUXILIARIES PLANT
 RANIPET-632 406

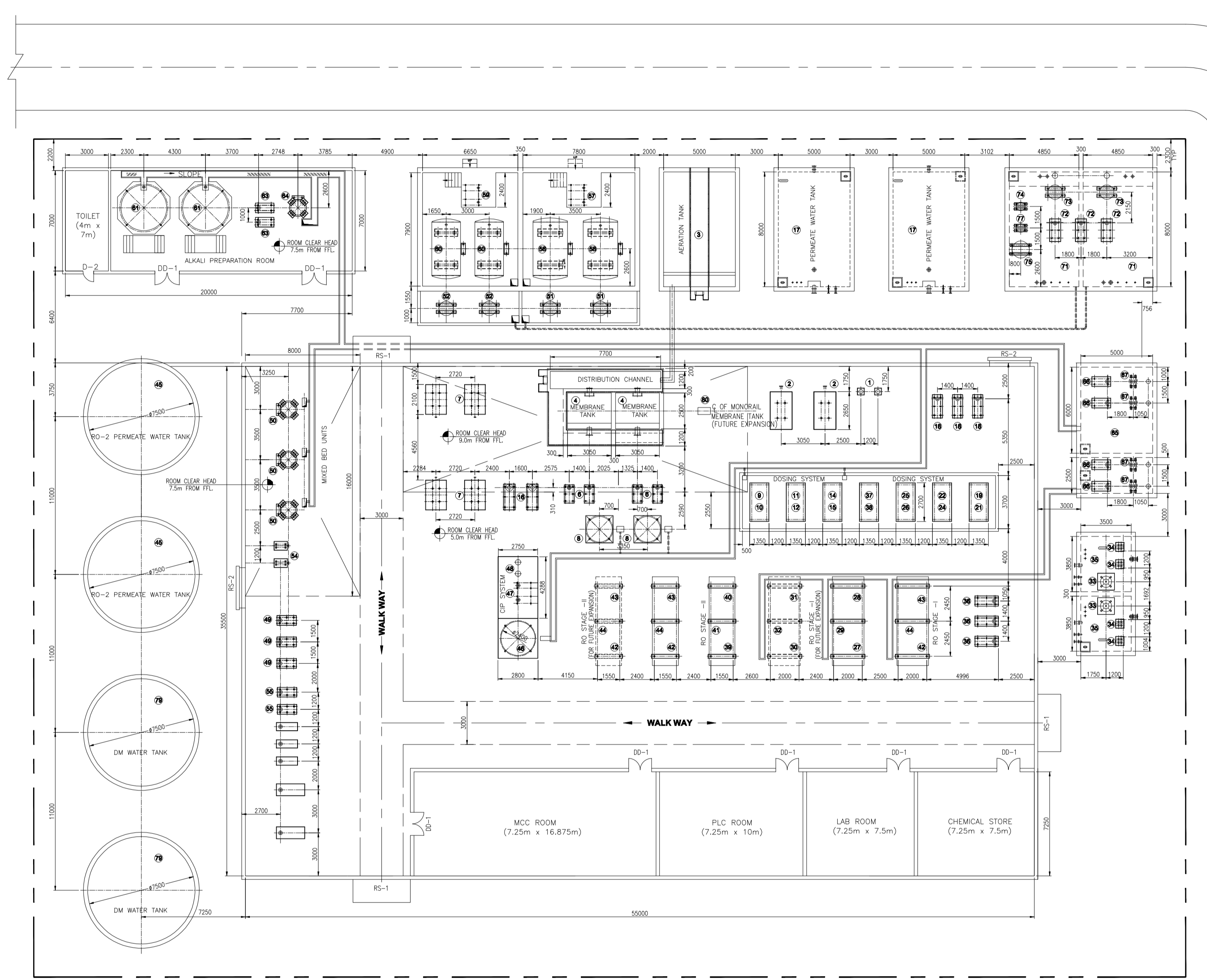
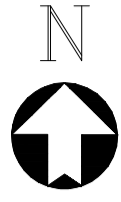
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|--|------------|-------------|------|------------------|
| COPY RIGHT AND CONFIDENTIAL | | | | |
| The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED it must not be used directly or indirectly in any way detrimental to the interest of the company. | | | | |
| DEPT CHD | DRN G.R | NAME T.A | SIGN | DATE 28.07.11 |
| 876 | APPD | T.A | | 28.07.11 |

TITLE
UF, RO-DM PLANT ROOM EQUIPMENT LAYOUT

| | | | |
|------|---------------------------------------|---------|-------|
| REV | DATE | ALTERED | D.B.N |
| 01 | 06.08.11 | CHECKED | T.A |
| ZONE | RAW WATER PUMP SHIFTED TO UF BUILDING | | |

| | | | |
|-------|-------|-----|-----------------------------|
| DEPT. | SCALE | NTS | DRAWING NO. |
| | | | 1 - BW - 220 - 00449 |
| SIGN | DATE | | SHEET 1 OF 1 |
| | | | REV. 01 |

244619-950-001
DRAWING NO.



PLAN

| SL. NO. | DESCRIPTION | SIZE / CAPACITY | QTY | UOM | MATERIAL | REMARKS |
|---|--|---|-----|-----|-----------|----------|
| 1 | AUTO SELF-CLEANING STRAINER | 80 m ³ /hr | 2 | No. | SS 316 L | |
| 2 | PROCESS AERATION BLOWER | 270 m ³ /hr @ 0.5 bar | 1 | No. | CI | |
| 3 | REACTOR / REACTION TANK | 8.0m x 5.0mW x 3.0 m SWD + 0.5m FR160 cum | 1 | No. | RCC | BY BH/EL |
| T-MBR STRAINERS-II | | | | | | |
| 4 | MEMBRANE TANK-1 & 2 | 3.05mL x 7.5mW x 3.35m HL | 2 | No. | RCC | BY BH/EL |
| 5 | T-MBR PLANT-1 & 2 | 2W 5000 X 1m Module | 4 | No. | PMDF | |
| 6 | PERMEATE / BACKFLUSH PUMP | 25 to 37 m ³ /hr @ 10 mwc | 4 | No. | SS316 | |
| 7 | PERMEATE AERATION BLOWER | 500 m ³ /hr @ 0.45 bar | 2 | No. | CI | |
| 8 | BACKFLUSH TANK | 1800 DIA X 2500 HL / 5.0 m ³ | 2 | No. | GRP | |
| T-MBR CLEANING SYSTEM | | | | | | |
| 9 | ROCCI DOSING TANK FOR MAINTENANCE CLEANING | 600 DIA X 1000 HL/ 200 Ltrs | 1 | No. | FRP | |
| 10 | ROCCI DOSING PUMP FOR MC | 56 lph @ 2 bar | 1 | No. | FRP / PVC | |
| 11 | ROCCI DOSING TANK FOR RECOVERY CLEANING | 600 DIA X 1000 HL/ 200 Ltrs | 1 | No. | FRP | |
| 12 | ROCCI DOSING PUMP FOR RECOVERY CLEANING | 576 lph @ 2 bar | 1 | No. | FRP / PVC | |
| 13 | CITRIC ACID DOSING TANK FOR MAINTENANCE | 600 DIA X 1000 HL/ 200 Ltrs | 1 | No. | FRP | |
| 14 | AGITATOR FOR CITRIC ACID TANK | 0.5HP / 1440 RPM | 1 | No. | FRP | |
| 15 | CITRIC ACID DOSING PUMP | 60 - 150 lph @ 2 bar | 1 | No. | FRP / PVC | |
| 16 | RECIRCULATION / DRAIN PUMP | 384 m ³ /hr @ 6 mwc | 1 | No. | SS316 | |
| 17 | T-MBR PERMEATE WATER TANK | 8.0m x 5.0m x 3.0mHL / 100 m ³ | 1 | No. | RCC | BY BH/EL |
| 18 | RO FEED WATER PUMP | 22.5 m ³ /hr @ 35mwc | 1 | No. | SS316 | |
| 19 | SIS DOSING TANK | 600 DIA, 1000 HL/ 200 Ltrs | 1 | No. | FRP | |
| 20 | AGITATOR SIS DOSING TANK | 0.5 HP / 1440 RPM | 1 | No. | SS316 | |
| 21 | SIS DOSING PUMP | 5 LPH @ 6 bar | 1 | No. | FRP / PVC | |
| 22 | ANTISCALANT DOSING TANK | 600 DIA, 1000 HL/ 200 Ltrs | 1 | No. | FRP | |
| 23 | AGITATOR FOR ANTISCALANT DOSING TANK | 0.5 HP / 1440 RPM | 1 | No. | SS316 | |
| 24 | ANTISCALANT DOSING PUMP | 1 LPH @ 5 bar | 1 | No. | FRP / PVC | |
| 25 | ACID DOSING TANK | 600 DIA, 1000 HL/ 200 Ltrs | 1 | No. | FRP | |
| 26 | ACID DOSING PUMP | 9 LPH @ 5bar | 1 | No. | FRP / PVC | |
| RO PLANT STAGE-I (STREAM-II) | | | | | | |
| 27 | RO-1 CARTRIDGE FILTER | 22.5 m ³ /hr | 1 | No. | SS 316L | |
| 28 | RO-1 HIGH PRESSURE PUMP | 24.3 m ³ /hr @ 36 Bar | 1 | No. | CF8M | |
| 29 | RO STAGE-I (STREAM-II) REPAIR | REPAIR : 2x5.25x17.5 m ³ /hr | 1 | No. | FRP | |
| RO PLANT STAGE-I (STREAM-III) | | | | | | |
| 30 | RO-1 CARTRIDGE FILTER | 22.5 m ³ /hr | 1 | No. | SS 316L | |
| 31 | RO-1 HIGH PRESSURE PUMP | 24.3 m ³ /hr @ 36 Bar | 1 | No. | CF8M | |
| 32 | RO STAGE-I (STREAM-III) REPAIR | REPAIR : 2x5.25x17.5 m ³ /hr | 1 | No. | FRP | |
| 33 | DEGASSER TOWER | 600 DIA x 3100 HDS | 2 | No. | MSR | |
| 34 | DEGASSER AIR BLOWER | 603 m ³ /hr @ 100 mmwc | 4 | No. | MS | |
| 35 | DEGASSER WATER TANK | 3.85mLx 4.0mWx3.0mHL / 30 m ³ | 2 | No. | RCC | BY BH/EL |
| 36 | RO STAGE-2 FEED PUMP | 17.4 m ³ /hr @ 35mwc | 1 | No. | CF8M | |
| 37 | ROCI DOSING TANK | 600 DIA, 1000 HL/ 200 Ltrs | 1 | No. | FRP | |
| 38 | ROCI DOSING PUMP | 5 LPH @ 5bar | 1 | No. | FRP / PVC | |
| RO PLANT STAGE - II (STREAM-II) | | | | | | |
| 39 | RO-2 CARTRIDGE FILTER | 17.5 m ³ /hr | 1 | No. | SS 316L | |
| 40 | RO-2 HIGH PRESSURE PUMP | 17.5 m ³ /hr @ 33.2 Bar | 1 | No. | CF8M | |
| 41 | RO STAGE-II (STREAM-II) REPAIR | REPAIR : 2x5.1x5/15.5 m ³ /hr | 1 | No. | FRP | |
| RO PLANT STAGE - II (STREAM-III) | | | | | | |
| 42 | RO-2 CARTRIDGE FILTER | 17.5 m ³ /hr | 1 | No. | SS 316L | |
| 43 | RO-2 HIGH PRESSURE PUMP | 17.5 m ³ /hr @ 33.2 Bar | 1 | No. | CF8M | |
| 44 | RO STAGE-II (STREAM-III) REPAIR | REPAIR : 2x5.1x5/15.5 m ³ /hr | 1 | No. | FRP | |
| 45 | RO-2 PERMEATE STORAGE TANK | 7.5mDIA, 10.0m HL / 400m ³ | 2 | No. | MS EPOXY | BY BH/EL |
| 46 | CHEMICAL CLEANING TANK | 2400 DIA X 1500 HL / 5 m ³ | 1 | No. | FRP | |
| 47 | CIP PUMP | 36 m ³ /hr @ 45mwc | 1 | No. | SS316 | |
| 48 | CIP HIGH-PRESSURE CARTRIDGE FILTER | 16 m ³ /hr | 1 | No. | SS 316L | |
| 49 | MB FEED PUMP | 15.5 m ³ /hr @ 35mwc | 1 | No. | SS 316 | |
| 50 | MIXED BED UNIT | 1000 DIA x 3000 HDS | 1 | No. | MSR | |
| 51 | ACID MEASURING TANK | 800 DIA X 900 HL / 400 Ltrs | 1 | No. | MSR | |
| 52 | ALKALI MEASURING TANK | 800 DIA X 900 HL / 400 Ltrs | 1 | No. | MSR | |
| 53 | AGITATOR FOR ALKALI MEASURING TANK | 0.5HP / 915 RPM | 1 | No. | SS316 | |
| 54 | PIS AIR BLOWER | 95 m ³ /hr @ 0.4 bar | 1 | No. | CI | |
| 55 | PIS REGENERATION PUMPS | 10 m ³ /hr @ 35mwc | 2 | No. | SS316 | |
| 56 | ACID UNLOADING PUMP | 10 m ³ /hr @ 2 bar | 1 | No. | FRP | |
| 57 | BULK ACID STORAGE TANK | 2400 DIA X 3750 LOS / 15m ³ | 2 | No. | MSR | |
| 58 | ALKALI UNLOADING PUMP | 10 m ³ /hr @ 2 bar | 1 | No. | SS316 | |
| 59 | BULK ALKALI STORAGE TANK | 2400 DIA X 3750 LOS / 10.0m ³ | 2 | No. | MSR | |
| 60 | ALKALI PREPARATION TANK | 3000 DIA X 1600 HL / 10 m ³ | 2 | No. | MSR | |
| 61 | AGITATOR FOR ALKALI PREPARATION TANK | 2.0HP/200 RPM | 2 | No. | SS316 | |
| 62 | ALKALI TRANSFER PUMP | 10 m ³ /hr @ 2 bar | 1 | No. | SS316 | |
| 63 | ACTIVATED CARBON FILTER FOR ALKALI | 1000 DIA x 2400 HDS | 1 | No. | RCC | BY BH/EL |
| 64 | WASTE WATER PUMP | 6.0m x 5.0m x 2.5m HL / 40m ³ | 1 | No. | MSR | |
| 65 | WASTE WATER DISPOSAL PUMPS | 600 DIA X 900 HL / 200 LITRES | 1 | No. | CF8M | |
| 66 | PRINTING CHAMBER | 600 DIA X 900 HL / 200 LITRES | 1 | No. | MSR | |
| 67 | BRINE PIT | 2.5m x 5.0m x 2.5m HL / 20m ³ | 1 | No. | RCC | BY BH/EL |
| 68 | PRINTING CHAMBER | 600 DIA X 900 HL / 200 LITRES | 1 | No. | CF8M | |
| 69 | PRINTING CHAMBER | 600 DIA X 900 HL / 200 LITRES | 1 | No. | MSR | |
| 70 | NEUTRALISING PIT | 6.0m x 5.0m x 2.5m HL / 60m ³ | 1 | No. | RCC | BY BH/EL |
| 71 | NEUTRALISED WATER TRANSFER PUMP | 60 m ³ /hr @ 3 Bar | 1 | No. | CF8M | |
| 72 | PRINTING CHAMBER | 1000 DIA X 900 HL / 500 LITRES | 1 | No. | MSR | |
| 73 | ACID DOSING TANK FOR NEUTRALIZATION | 600 DIA X 900 HL | 1 | No. | MSR | |
| 74 | LIME DOSING TANK | 1000 DIA X 1200 HL | 1 | No. | MSR | |
| 75 | AGITATOR FOR LIME DOSING TANK | 0.5HP/25 RPM | 1 | No. | SS316 | |
| 76 | ALKALI DOSING TANK FOR NEUTRALIZATION PIT | 600 DIA X 900 HL | 1 | No. | MSR | |
| 77 | AGITATOR FOR ALKALI DOSING TANK | 0.5HP / 915 RPM | 1 | No. | SS316 | |
| 78 | DM WATER TANK | 7.5mDIA, 10.0m HL / 400m ³ | 2 | No. | MS EPOXY | BY BH/EL |
| 79 | DM WATER TANK | 7.5mDIA, 10.0m HL / 400m ³ | 2 | No. | MS EPOXY | BY BH/EL |
| 80 | ELECTRIC MONITORIAL HOST | 5 TON CAPACITY | 1 | No. | MS | |

REFERENCE DRAWING NO.
1. P&I DIAGRAM - BH/EL-953-001

NOTES:
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
2. MINIMUM CLEAR HEAD REQUIRED IS 10MTRS FROM FINISHED FLOOR LEVEL FOR MEMBRANE TANK AREA.
3. CHEMICAL STORAGE/DOSING AREA ARE TO BE COVERED WITH ACID/ALKALI RESISTANT TILES.
4. RCC TANK WALL THICKNESS TO BE DECIDED BY CLIENT BASED ON SBC VALUE.

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| CUSTOMER | PRAGATI POWER CORPORATION LIMITED |
| CUSTOMER'S CONSULTANT | NTPC-CONSULTANCY WING |
| JOB NO. | PRAGATI - II COMBINED CYCLE POWER PROJECT |
| STATUS | CONTRACT |
| DISTRIBUTION | 750MW (NOMINAL) AT BAMNAULI, DELHI RO-DM PLANT - 30 CUM/HR. |

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|--|------|-----|-----|------|-------|--------------|-------|----------------|----------|
| GE Water & Process Technologies | | | | | | | | | |
| BHARAT HEAVY ELECTRICALS LTD BOILER AUXILIARIES PLANT RANIPET-632406 | | | | | | | | | |
| REV. | DATE | ALT | CHD | APPD | DEPT. | DRN. | NAME | SIGN. | DATE |
| | | | | | M | DESIGNER/SAV | | | 11.08.11 |
| | | | | | | CHK | TA | | 11.08.11 |
| | | | | | | APPD | TA | | 11.08.11 |
| TITLE EQUIPMENT LAYOUT FOR RO-DM PLANT | | | | | | | | | |
| REV. | DATE | ALT | CHD | APPD | DEPT. | SCALE | SCALE | DRAWING NO. | |
| | | | | | | 1:200 | 1:200 | 244619-956-001 | |
| SHEET 1 OF 1 REV. 2 | | | | | | | | | |