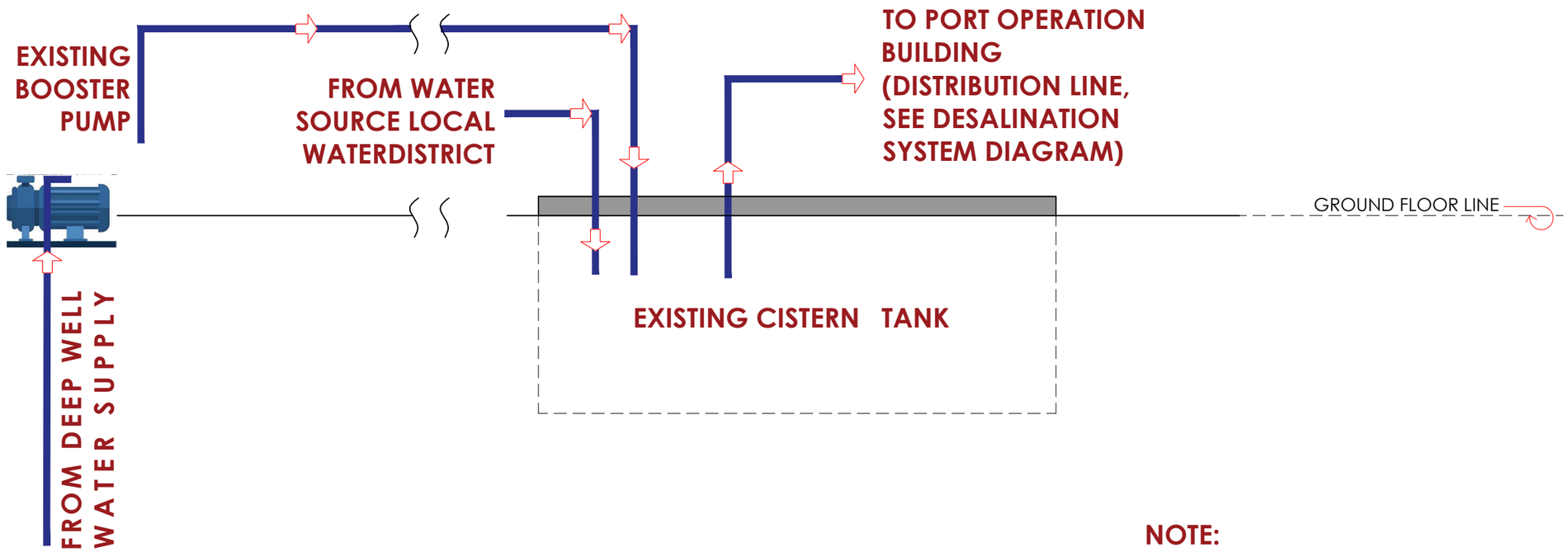



**NOTE:**

**Verify location based on actual site conditions.**

## WATER SUPPLY LINE LAYOUT

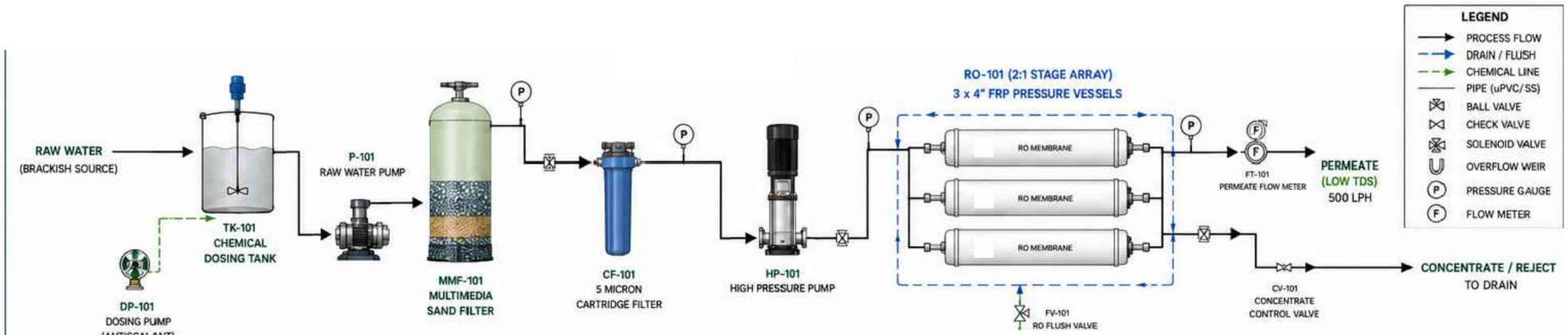
SCALE NDTS

PHILIPPINE PORTS AUTHORITY

PORT OF CAGAYAN DE ORO MISAMIS ORIENTAL

| | | | | | |
|---|---|---|---|---|---|
| TITLE: | Maintenance of Watering System (MPF-MOC-96-2026) | | | | SHEET NO. 1/2 |
| LOCATION: | PORT OF BALINGOAN | | | SHEET CONTENTS | |
| PREPARED BY: PRINCESS PEARL S. PISARES, Administrative Assitant II | CHECKED BY: HAZEL GRACE N. QUIBLAT, Acting Supervising Engineer | RECOMMENDED BY: MARC M. AVELLANA, Acting ESD Manager | APPROVED: FERNANDO B. MAPALO, JR., Port Manager | AS INDICATED | |

# 500 LPH BRACKISH WATER RO (BWRO) DESALINATION SYSTEM




| DESIGN FLOW |
|---|
| 0.5 $m^3$/hr (500 LPH) @ 25°C |
| PEAK FLOW (1.5x) 750 LPH |

| DESIGN CRITERIA | |
|---|---|
| FEED WATER TDS (DESIGN) | 5,000 – 15,000 ppm |
| FEED WATER TDS (MAX) | Up to 35,000 ppm* |
| PERMEATE TDS (TYP.) | 150 – 450 ppm |
| SALT REJECTION | 97 – 98 % |
| SYSTEM RECOVERY (TYP.) | 65 – 75 % |
| OPERATING PRESSURE | 8 – 12 bar |
| FEED WATER TEMP. | 25 – 30 °C |
| pH RANGE | 6.5 – 8.5 |

| PERMEATE QUALITY (TARGET) | |
|---|---|
| TDS | ≤ 450 ppm (Typical) |
| TSS | ≤ 1.0 mg/L |
| SDI | ≤ 3 |
| TURBIDITY | ≤ 0.5 NTU |
| pH | 6.5 – 8.5 |
| BACTERIA | Non-detectable |

| SYSTEM PERFORMANCE (TYP.) | |
|---|---|
| PERMEATE FLOW | 500 LPH (12.0 $m^3$/day @24 hr) (5.0 $m^3$/day @10 hr) |
| RECOVERY | 65 – 75 % |
| SALT REJECTION | 97 – 98 % |

* System rated for feed TDS up to 35,000 ppm at reduced recovery and with proper pretreatment.

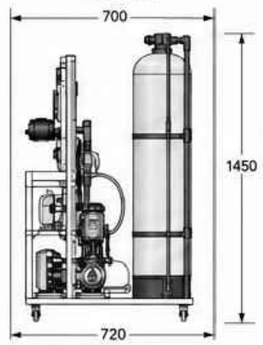
## SYSTEM GENERAL ASSEMBLY (FRONT VIEW)



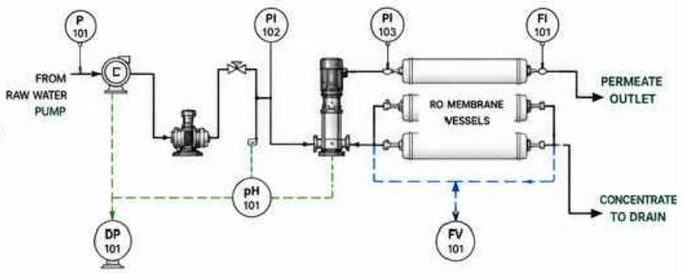

## FRONT VIEW




## SIDE VIEW




## PROCESS & INSTRUMENT DIAGRAM (P&ID DETAILS)




| EQUIPMENT LIST | | | |
|---|---|---|---|
| TAG NO. | DESCRIPTION | QTY | MATERIAL |
| TK-101 | CHEMICAL DOSING TANK | 1 | PE |
| DP-101 | DOSING PUMP (ANTISCALANT) | 1 | PVDF |
| P-101 | RAW WATER PUMP | 1 | SS304 |
| MMF-101 | MULTIMEDIA SAND FILTER | 1 | FRP |
| CF-101 | 5 MICRON CARTRIDGE FILTER | 1 | uPVC |
| HP-101 | HIGH PRESSURE PUMP | 1 | SS304 |
| RO-101 | RO MEMBRANE VESSELS (4" FRP) | 3 | FRP |

| RO MEMBRANE & PRESSURE VESSELS | |
|---|---|
| ITEM | SPECIFICATION |
| MEMBRANE TYPE | 4" x 40" BWRO, TFC |
| MEMBRANE QTY | 3 PCS |
| VESSEL QTY | 3 PCS |
| VESSEL MATERIAL | FRP |
| ARRAY CONFIGURATION | 2:1 STAGE ARRAY |

| ELECTRICAL SPECIFICATIONS | |
|---|---|
| ITEM | SPECIFICATION |
| POWER SUPPLY | 220V, 1Ø, 60Hz |
| CONTROL VOLTAGE | 220VAC / 24VDC |
| TOTAL CONNECTED LOAD | ~3.5 kW |
| RECOMMENDED SUPPLY | 5 kVA (MINIMUM) |
| CONTROL PANEL | NEMA 4X / IP65 |

| MATERIALS OF CONSTRUCTION (MAJOR) | |
|---|---|
| COMPONENT | MATERIAL |
| PIPING (LOW PRESSURE) | uPVC SCH 80 |
| PIPING (HIGH PRESSURE) | SS304 |
| VALVES | uPVC / SS304 |
| PUMPS | SS304 |
| FRAME / SKID | SS304 |

NOTES:

1. ALL PIPES: uPVC SCH 80 (LOW PRESSURE) UNLESS OTHERWISE SPECIFIED.
2. HIGH PRESSURE PIPES & FITTINGS: STAINLESS STEEL 304.
3. ALL DRAINS & FLUSH LINES: uPVC.
4. ALL DIMENSIONS ARE IN MILLIMETERS.
5. PERMEATE QUALITY MAY VARY DEPENDING ON FEED WATER QUALITY.
6. FOR REFERENCE ONLY.

PHILIPPINE PORTS AUTHORITY

PORT OF CAGAYAN DE ORO MISAMIS ORIENTAL

TITLE: Maintenance of Watering System (MPF-MOC-96-2026)

LOCATION: PORT OF BALINGOAN

SHEET CONTENTS: AS INDICATED

SHEET NO. 2/2

| PREPARED BY: | CHECKED BY: | RECOMMENDED BY: | APPROVED: |
|---|---|---|---|
| PRINCESS PEARL S. PISARES | HAZEL GRACE N. QUIBLAT | MARC M. AVELLANA | FERNANDO B. MAPALO, JR. |
| Administrative Assitant II | Acting Supervising Engineer | Acting ESD Manager | Port Manager |