



**Proud to offer the  
Design, Manufacture and Supply of the enclosed offer**

<b>Submission Date</b>	MAY 26, 2023
<b>Buyer</b>	SINDH JUDICIAL ACADEMY
<b>Project Name</b>	SEA WATER RO ON 45000 TDS
<b>Project Location</b>	STUDIO APARTMENT 1&2, FEROZENANA ROAD, BATH ISLAND, CLIFTON, KARACHI.
<b>Project Application</b>	20,000 GPD RO

<b>Item</b>	<b>Technical Specification 20,000 gpd ro on 45000 feed tds.</b>	
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1. **Raw Water Booster Pump** 1  
 This pump is used to boost water pressure from a positive suction water tank and deliver to pretreatment at pressure and volume required.

<b>Pump Power</b>	2.0	H.P.	1.5	kW
<b>Flow rate</b>	35.0	USGPM	8.0	m <sup>3</sup> /hr
<b>Pressure</b>	60.0	PSI	4.1	BAR

**Application:** Service and backwash  
**Brand:**  
**GOULDS** Italy/ Grundfos / KSB or equivalent  
**Motor:** TEFC  
**Pump fluid end:** SS 316L  
**Pressure Gauge:** 0-100 PSI  
**Check Valve:** PVC SCH 80  
**Inlet and Outlet Valve:** Ball or Butterfly type

2. **Multi Media Filtration Manual** 1  
 This system is used to reduce sand and sediment (turbidity).

**Media tank:** 36" Ø x 72"  
**Make:** Canature/ Pentair/So Safe  
**Tank material:** Fiberglass

<b>Flow rate</b>	40.0	USGPM	9.1	m <sup>3</sup> /hr

**Valve sequence:** manual backwash  
**Media content:** gravel, Silica sand and anthracite  
**Valve:** manual UPVC  
**Test pressure:** 150 psi  
**Wetted parts:** 316 Stainless steel  
**Pressure Gauge:** inlet and outlet of each tank 4" size

3. **Chemical Dosing package** 2  
 The dosage injection pump will allow injecting different chemical into the feed water or permeate (product) water of the water treatment plant.

**Brand:** Etatron Italy or Aqua Italy  
**Application:**  
 ANTI SCALLEN  
 BIOCID  
 Installation Kit in PVDF  
 Chemical tank 80 liters HDPE  
 Tank

4. Reverse Osmosis System

Make: So Safe

<b>Recovery design</b>	40.0%			
<b>Influent Flow Rate</b>	35.0	GPM	8.0	m <sup>3</sup> /hr
<b>Effluent Flow rate</b>	14.0	GPM	3.2	m <sup>3</sup> /hr
	20,000	GPD	76	m <sup>3</sup> /hr
<b>Water Temperature</b>	77.0	°F	25.0	°C
<b>Influent Quality</b>	45,000	PPM	MG/L	TDS
<b>Effluent Quality</b>	<400	PPM	MG/L	TDS
<b>Inlet pressure</b>	45.0	PSI	3.1	BAR

**Technical Specifications**

**Frame**

The system is skid mounted on heavy-duty steel frame epoxy coated.

**High Pressure Pump**

Heavy Duty High-pressure pump with corrosion resistant parts

<b>Flow rate</b>	35.00	USGPM	7.95	m <sup>3</sup> /hr
<b>Discharge Pressure</b>	1,100.0	PSI	75.9	BAR

**Brand:** Fedco / Goulds / Grundfos/ KSB

**Pump Fluid End:** 2205 Duplex stainless steel

**Quantity of pumps:** 1

**Type:** Axial Positive Displacement

**VFD control pump**

**VFD make:** INVT/ABB or equivalent

**High Pressure Motor**

The high-pressure motor is for heavy-duty industrial application. This motor is designed to operate on a 24 hour per day.

**Brand:** Fedco /Siemens/KSB/Grundfos/Goulds

<b>Power</b>	40.0	H.P.	29.8	kW
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**Type:** TEFC

**Qty:** 1

**Reverse Osmosis Pressure Vessel**

Heavy duty reverse osmosis pressure vessel housings are constructed in fiberglass

**Quantity:** 1

**Brand:** First line or Equivalent

**Model:** 1200 PSI / side port

**Reverse Osmosis Membrane Elements**

The reverse osmosis membranes used in this application are TFC. This is a thin film composite (TFC) spiral wound membrane.

**Number of stages:** 1

**Total Membranes:** 5

**Brand:** DOW Filmtec / toray/LG

**Model:** SW30HRLE-400 or equivalent

### **Sample Permeate Ports**

Sample ports will be installed in each reverse osmosis pressure vessel to allow evaluation of the product water quality.

Qty: 2 nos

### **Main Electrical Enclosure**

The Motor control panel and the low voltage control panel are corrosion resistant.

**Type:** NEMA 12

### **Product Water Flow meter**

The inline Rota meter flow meter will read product water flow rate.

**Brand:** EU

**Qty:** 1 No

### **Reject Water Flow meter**

The inline Rota meter flow meter will read reject water flow rate.

**Brand:** EU

**Qty:** 1 No

### **Pressure Gauges**

Stainless steel liquid filled pressure gauges for maximum monitoring and visibility.

**Brand:** Wika Germany

**Case material:** 304 stainless steel

**Wetted part:** 316 Stainless steel

**Dial size:** 4" Diameter

**Process Connection:** ¼" NPT

### **Reject Water Pressure Regulator Valve**

Heavy-duty stainless steel pressure regulator. This regulator will allow the operator to adjust the backpressure in the reverse osmosis membranes.

**Material:** stainless steel 316L

### **Raw Water Actuator Valve**

This valve will close and open at every start up and shut down of the plant

**Valve:** Electric Motorized actuator

**Wetted parts:** 316 Stainless steel

**Make:** EU/USA

### **Electrical Components**

The plant will include all the necessary contactors, starters, Magnetic starters, overload relays, terminal blocks, relays, circuit breakers, and indicator lights.

Make: Schneider/ABB/Siemens

### **Safety Features**

All pressure switches are provided to protect the reverse osmosis plant against inadequate flows, and pressure to, and from the inlet, and outlet of the plant.

Low and high switch

**Quantity:** 2

**Functions:** High Pressure Pump suction & discharge and permeate

**Brand:** Sick Germany/ Danfos

**Material:** Stainless steel wetted parts

### **Hour meter**

The screen will also illustrate the total accumulated operational hours

### **Main Disconnect Switch**

This allows interrupting the power to the High Voltage panel prior to servicing it and meets UL standards.

5. **Programmable Logic Control (PLC)** 1  
 The equipment features state of the art PLC system to accurately monitor, and control all the different I/O of the plant.  
**Brand:** Delta / ABB/Siemens
- Human Interface (HMI) Monitor**  
 The equipment features a HMI to visualize the different functions of the plant to guarantee a smooth operation in the field.  
**Brand:** Same companies  
**Model:** 5" monochrome
6. **Low Pressure Piping and Valves** 1  
 Low-pressure piping and valves will be supplied in rigid and flexible plastic.  
**Material:** PVC SCH 80 and flexible polyethylene tubing
7. **High Pressure stainless steel piping** 1  
**Material:** 316L stainless steel
8. **Pre-filter Housing** 1  
 Integrated cartridge filtration  
**Application:** 5-micron cartridge filter  
**Brand:** EU/USA  
**Material:** PVC  
**NO of cartridges:** 7 cart 20"
9. **High Pressure Motor Variable Frequency Drive (VFD)** 1  
 Digital high power Variable Frequency Drives (VFD) to allow accurate speed of the high pressure motor and also smooth start and stop operation.  
**Motor Controller:** Variable Frequency Drive (VFD) for speed control  
**Make:** Delta/Invnt/ABB
10. **TDS (Total Dissolved Solid) Meter – Permeate water and feed water** 2  
 Inline Permeate water TDS monitor for continuous reading with low / high set points.  
**Brand:** Createc /GF Signet or equivalent  
**Application:** NEMA 4x / IP65  
**Inlet TDS controller :** up to 45,000 ppm  
**Out let TDS controller up to :** 1000 ppm
11. **Clean In Place (CIP) Unit for Membranes** 1  
 This CIP skid will allow the operator to clean the membrane with all the correct solution in order to maintain the membranes in optimum conditions and extend the longevity.

<b>Pump Power</b>	2.0	H.P.	1.5	kW
<b>Flow rate</b>	30.0	USGPM	6.8	m <sup>3</sup> /hr
<b>Pressure</b>	50.0	PSI	3.4	BAR

**Tank:** 200 gallons

**Tank Material:** HDPE

**Pump make :** Goulds Italy/Grundfos/KSB/

**Pump:** 316 Stainless steel fluid end

**Electrical Control Panel:** NEMA 12

**Filter Canister:** 5 microns cartridge

**Skid:** Stainless steel frame

**Piping:** PVC SCH 80

**Float:** Low Level

**Pressure Gauge:** 0-100 PSI

12. **Membrane Fresh Flush System**

1

Fresh Flush System will allow the system to flush the membrane with permeate water at every shut down in order to maintain the membranes in optimum conditions and extend the longevity.

**Piping:** PVC SCH 80

**Actuator valve :** Motorized

**Make:** EU/USA

**PH Meter – Permeate water**

**1.**

Inline Permeate water ph monitor for continuous reading with low / high set points.

**Brand:** Createc / GF Signet or equivalent

**Application:** NEMA 4x / IP65

**FEED WATER TANK**

Make : Master or equivalent

Material: HDPE

Capacity: 1500 gallons

Qty : 1 No

**FLOAT SWITCHES**

Make: Turkey or equivalent

Qty: 5 nos

**PIPING WORKS ON WALLS**

2" UPVC piping with wall L brackets including all fittings. For bore water, brine water and product water. Complete in all respect

Qty : 450 rft

**CORE HOLES**

Size 3" : 4 nos

**ELECTRICAL CABLE WORKS**

As per the load of the ro plant. 4 core flexible

Qty required: 200 rft from main panel to ro plant

Job inclusive of cable tray

**EXCAVATION FOR PIPING WORKS**

Digging, road cutting and refilling of trenches for 2" brine line UPVC. Depth 1'.

Qty: 100 rft.

One complete job

**CIVIL WORKS**

Construction of wall

Block masonry with plaster and white washing

Size of wall : 60'x6'

Door opening : 6 feet

Door : PVC

**BORE WORKS- QUOTE SEPRATE PRICE.**

1000 FEET deep bore hole dia 16" pipe laying 8" UPVC sch 80

Complete in all respect.

Pump Make: Goulds/ Grundfos/Wilo or equallent

Material : 316L

Flow: 80 gpd

Qty: 1 no.

With riser pipe PE or equallent.

Hanging wire

Electrical cable

Control panel

**NOTE: DESIGN LIFE OF THE PLANT SHOULD BE 20 YEARS MINIMUM**

**UN LOADING OF PLANT AND PLACEMENT IN BASEMENT OF THE BUILDING :  
SUPPLIER RESPONSIBILITY**

**COMPLETE INSTALLATION OF PLANT ON TURNKEY BASIS SUPPLIER  
RESPONSIBILITY.**

**COMMISSIONING AND TRAINING IS SUPPLIER RESPONSIBILITY.**

**ONE YEAR RUNNING CARTRIDGES AND CHEMICALS. QUOTE SEPERATLY**

1. Anti scallent per year : 920 liters  
Dose 5 ppm
2. Cartridges PP yarn 20" 5 micron: 300 nos  
Replacement after 10 days
3. Membrane cleaning once a year ;
4. Biocide : 365 Kg  
1 ppm dose.
5. SMBS : 100 Kg
6. Water test report from the lab : once in a month complete chemical report
7. 3 Operators 8 hrs shift.

