

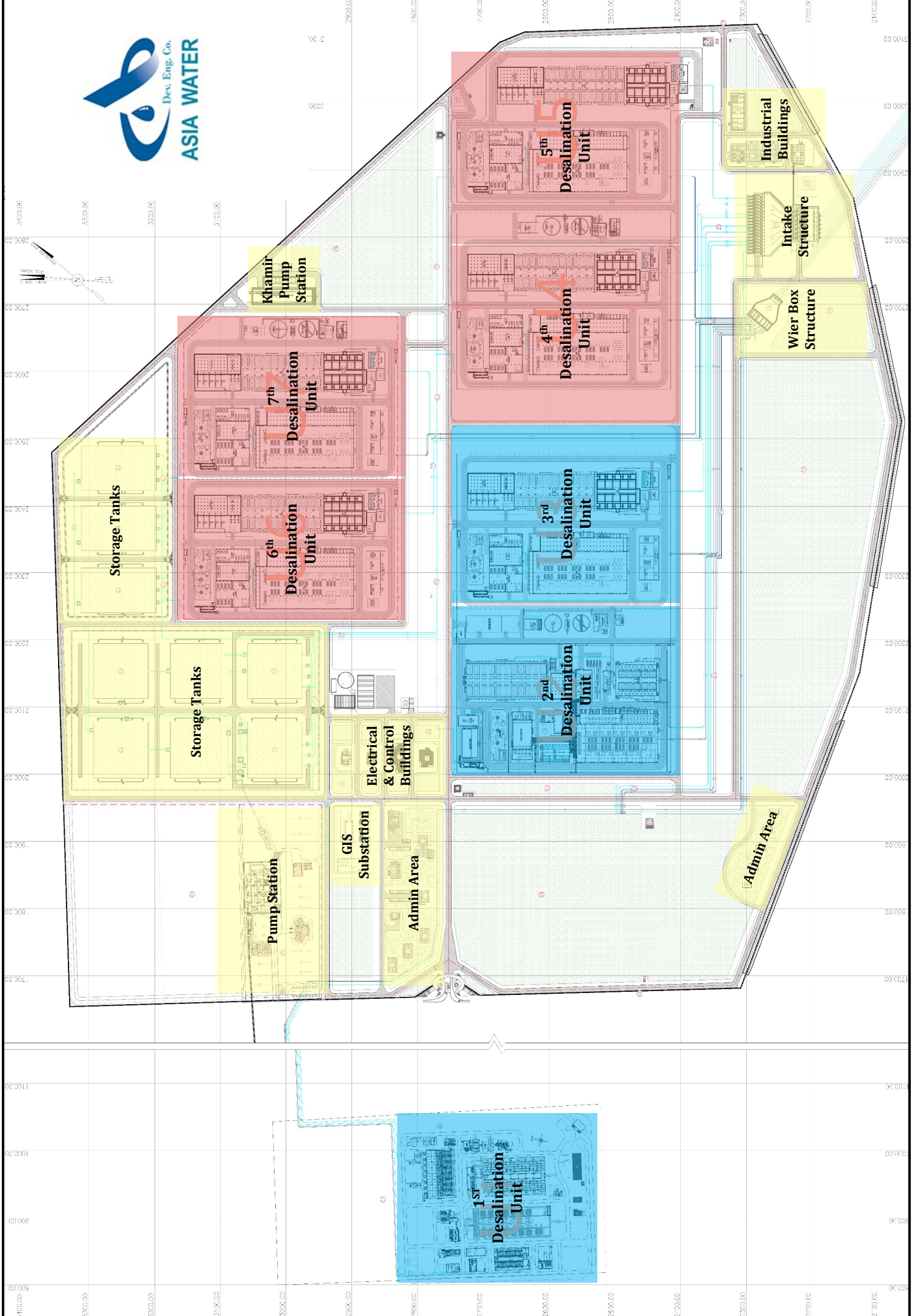
شرکت مهندسی توسعه آب آسیا



Asia Water Development Engineering Company



We have not inherited water from our fathers but borrowed from our children.



Project Overview:

- ▶ Construction of water transmission pipeline to the tie-in points of desalination plants from Intake structure
- ▶ Installation of intake electromechanical equipment and centrifugal pumps
- ▶ Construction of a 200 MLD desalination unit in form of BOO Contract
- ▶ Construction of required infrastructures for desalination complex (1000 MLD capacity)
- ▶ Construction of Surrounding Walls, Entrance Gate, Roads, Pavements & Green Areas



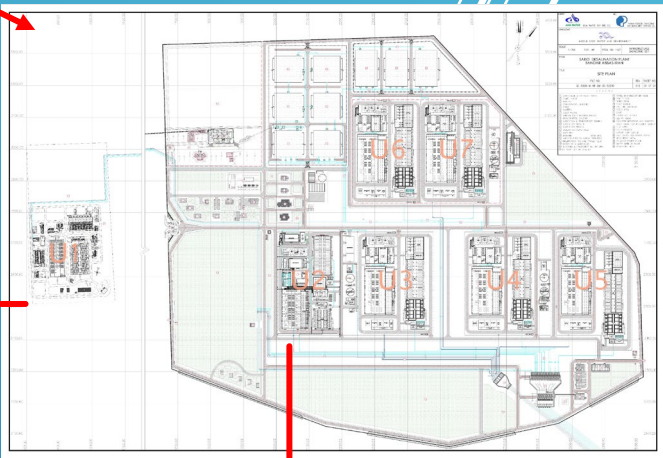
Scope of Work :

Engineering, Procurement, Construction, Commissioning & Operation of 200 MLD Desalination Plant, Water transmission pipeline and the relevant infrastructures.

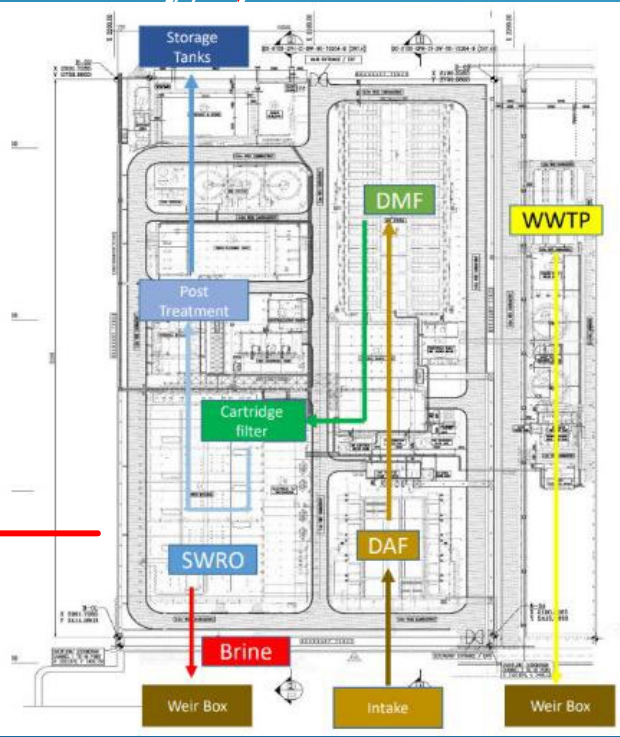
Asia Water Development Engineering Company has the task of managing design, construction and operation of sea water desalination units for drinking purposes for Hormozgan province as well as for industrial and mining purposes of National Iran Copper Industries Company, Gol Gohar Mining & Industrial Company and Chadormalo Mining and Industrial Company. The philosophy of company is to try to maintain and increase the interests of shareholders and society.



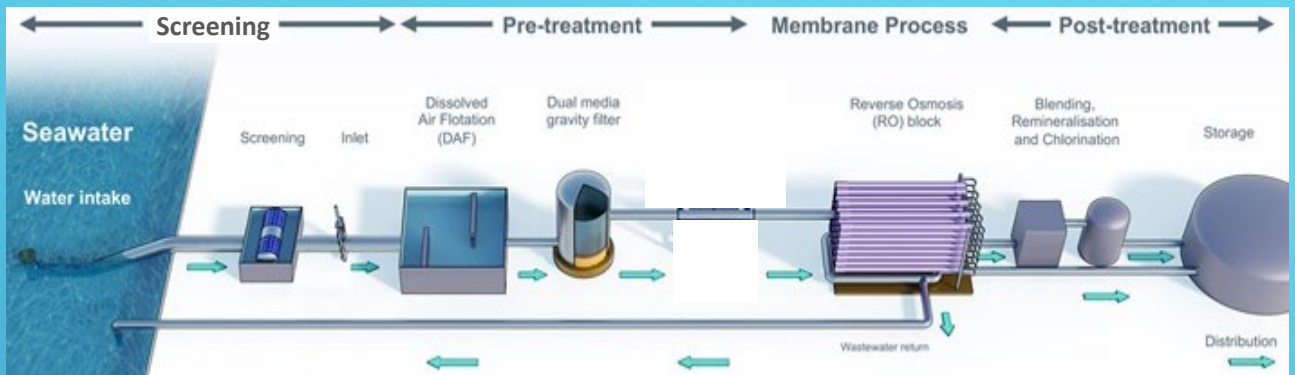
- 1st phase: including the construction of additional facilities to supply required water of the desalination units and other required infrastructures and supply desalination of Persian Gulf water at the rate of 400 thousand cubic meters per day in the form of 200 thousand cubic meter unit by the BOO investor contractor and a 200,000 cubic meter unit by Asia Water Development Company.
- 2nd phase: includes increasing the desalination capacity by 600 thousand cubic meters per day (construction of three desalination units with capacity of 200 thousand cubic meters each).
- 3rd phase: increasing the capacity by 400 thousand cubic meters per day.



The components of Bandar Abbas desalination site are: Intake Structure, Chlorination Buildings ,Intake Substation, Weir Box Structure, Desalination Units, Office Buildings, Desalinated Water Storage Tanks, Power Plant and GIS 230 to 63 Substation, 63 to 33 and 11 kV substation, Pump Station, Electrical and Control buildings



Stages and General Process of Sea Water Desalination



Seabed dredging operation have been carried out with length of 2,300 meters and volume of approximately 1.1 million cubic meters, and the dredged materials have been unloaded on land in order to comply with environmental standards. Installation of offshore pipelines with diameter of 2.5 meters in 10 lines with total length of 15 kilometers has been carried out on the seabed.



The Intake structure is 95 meter long concrete tank with variable width from 48 to 91 meters and depth of 12 meters with pumping capacity of 4,500,000 cubic meters per day and has 7 active inlets. There are Bar Screens at beginning of the structure with aim of removing materials larger than 25 mm and then there are Band Screens, which are located in order to remove particles larger than 3 mm. Also, 19 pumps of 1640 kilowatts have been considered to transfer sea water to desalination facility.

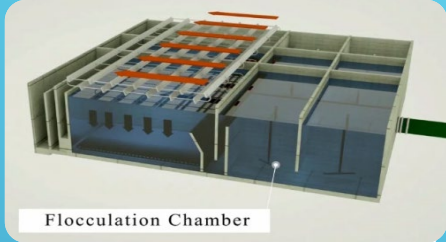


The chlorinated water from Intake enters the desalination units through the onshore.

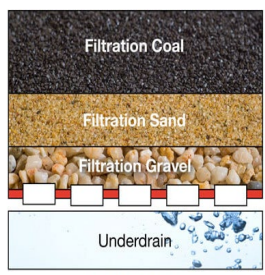
Water Intake from the sea is carried out at distance of 1200 meters from Intake structure and from depth of 15 meters of the sea via suction chambers, which prevent the entry of large marine organisms by suctioning water as primary filter. There are 7 suction chambers on the seabed, and water is transferred to Intake by gravity through 7 polyethylene pipes with diameter of 2.5 meters.



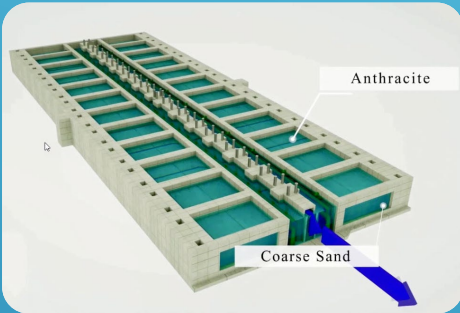
At first stage, there is Dissolved Air Flotation Structure (DAF System) with 10 cells, in which the insoluble particles of clot are first suspended on water with air blowing. Flocs suspended on water, which are in form of foam, are collected by scrapers and directed to thickeners of the Wastewater Treatment Plant (WWTP) through concrete channels. The output water of DAF structure enters DMF structure by gravity without need to pump.



Flocculation Chamber



DUAL-MEDIA



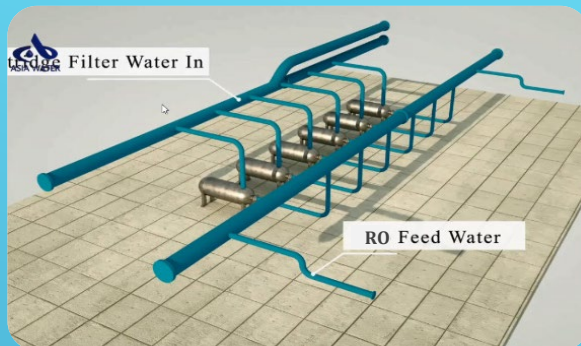
At second stage, there is Dual Media Filters (DMF System) with 22 cells. These cells contain sand and anthracite to absorb water insoluble particles. The pre-treatment capacity is designed to be two and a half to three times the capacity of desalination unit, which means a range between 500 and 600 thousand cubic meters per day.

Chemical Building prepares and injects the chemical additives needed in Pre-treatment and Reverse Osmosis into the system.

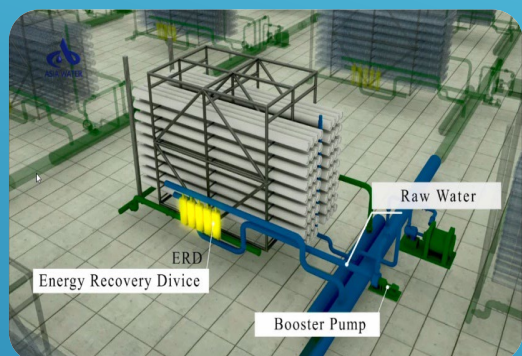


DMF output water enters the tank by gravity and is pumped by 5 pumps from Filtered Water Structure to Reverse Osmosis Building.

At third stage, there is Reverse Osmosis Building (SWRO Building). The inlet water is distributed through a header between 10 chambers of filter cartridge to remove particles larger than 5 microns before entering the membranes.



Thereafter, the water enters to collector and is distributed between RO trains via two supply pipes. In order to provide 60 bar pressure, a high pressure pump has been considered for each unit, that is total of 9 pumps. Each RO unit contains 317 pressure vessels and inside each pressure vessel there are 7 membranes, which means 2219 membranes in a RO unit and total of 19971 membranes in RO hall.



For saving energy consumption purposes, Pressure Exchanger energy recovery system has been used with higher 90% efficiency, which causes about 50% to 60% of the consumed energy to be recovered, and the pressure is maintained at 60 bar with help of booster pumps.

The desalinated water is transferred to the Post-Treatment section to add the required materials and adjust the desired parameters.



Finally, the desirable indicators and the volume of desalinated water are measured in Metering Area and compared with the allowed values.

Desalinated water produced by units is transferred to 9 storage tanks. About 440 piles with length of 30 to 40 meters have been implemented to strengthen the bed under foundation of each tank.



The suspended flocs in DAF are in the form of foam, collected by scrapers and directed to thickeners of wastewater treatment plant (WWTP) through concrete channels. As well as, backwash water of Dual Media Filters is also transferred to WWTP.



The Brine water is transported by separate pipes to Weir Box Structure. The Weir Box is capable of discharging 7,200,000 cubic meters of water per day. This structure is semi-buried, which transports sewage according to environmental standards to depth of 10 meters at distance of 2300 meters of sea via 3 pipes with diameter of 2.5 meters. The waste water is distributed uniformly in depth of water by diffusers installed at the end of all three waste pipes.

The marine environment monitoring program has started and continues by Tehran University, Hormozgan University and using accredited laboratories of Environment Organization since 2016 and before start of desalination in order to awareness the possible changes in physical, chemical and biological factors of sea in accordance with national standards.



Required electricity of Plants is provided via construction of an exclusive 63 to 33 and 11 kV substation.



Electricity is distributed to different parts of the desalination unit by electricity building.

CCR: Central Control Building

Substations: Electricity Distribution Centers



General Specifications :

Bandar Abbas 200 MLD desalination plant is one of the modules of 1000 MLD desalination Complex of Asia Water Development Engineering Company, built to provide consumable water of the industrial and mining sectors (copper and steel). The product of this project is desalinated water, which requires pre-treatment before reverse osmosis filtration due to high TDS of Persian gulf raw water,.

This project is located on the northern coast of Persian Gulf, about 35 kilometers west of Bandar Abbas.

Project Volumes		
Operation	Quantity	Unit
Seabed Dredging	1,100,000	m ³
Excavation	1,019,000	m ³
Formwork	279,000	m ²
Concreting	144,000	m ³
Reinforcement	14,000	Ton
Cabling	440	Km
Metal Structure	3,270	Ton
Piping	167,000	Inch
Marine Pipelines	15,000	m





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