

MBR SEWAGE TREATMENT PLANT

SUIDO KIKO MIDDLE EAST



SKME OVERVIEW

- Suido Kiko ME is an engineering and construction company in the water & waste water sectors.
- The company is a joint Venture Company Between Saudi Brothers Commercial Co. and Suido Kiko in Japan.
- Saudi Brothers Commercial Company. are the owners of SAWACO-Water Desalination Company.
- Suido Kiko Middle East has SBCC (SAWACO) 's experience in Saudi Arabia and Suido Kiko's water treatment technology.
- Suido Kiko Middle East was formed for the intent of providing leading edge technological solutions in the water and waster sectors : RO, MBR, Water Re-Use,UF, MF, NF etc.

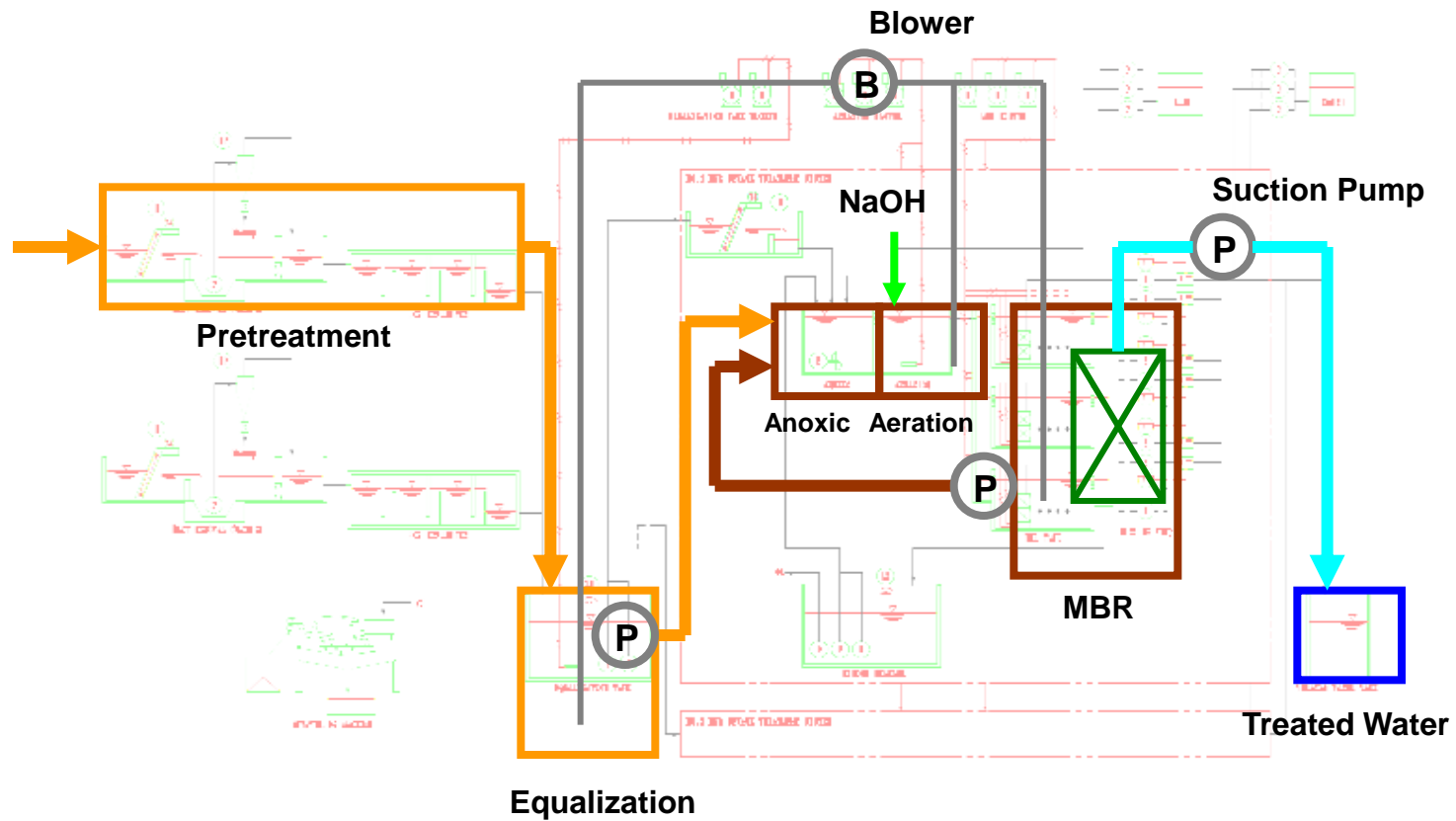


DESIGN CONDITION

- Average annual flow rate
: 9500m³/d
- Seasonal fluctuation
: 1.5 times (14250m³/d)
- Daily fluctuation
: 2 times (19000m³/d)
- Storm event
: 4 times (38000m³/d)

	Raw Water	Treated Water
BOD5	150 mg/L	10 mg/L
TSS	300 mg/L	1 mg/L
NH3	35 mg/L	1 mg/L
TKN	40 mg/L	3 mg/L
Alkalinity	100 mg/L	-
FOG	30 mg/L	-
Total Phosphorus	4 mg/L	3 mg/L

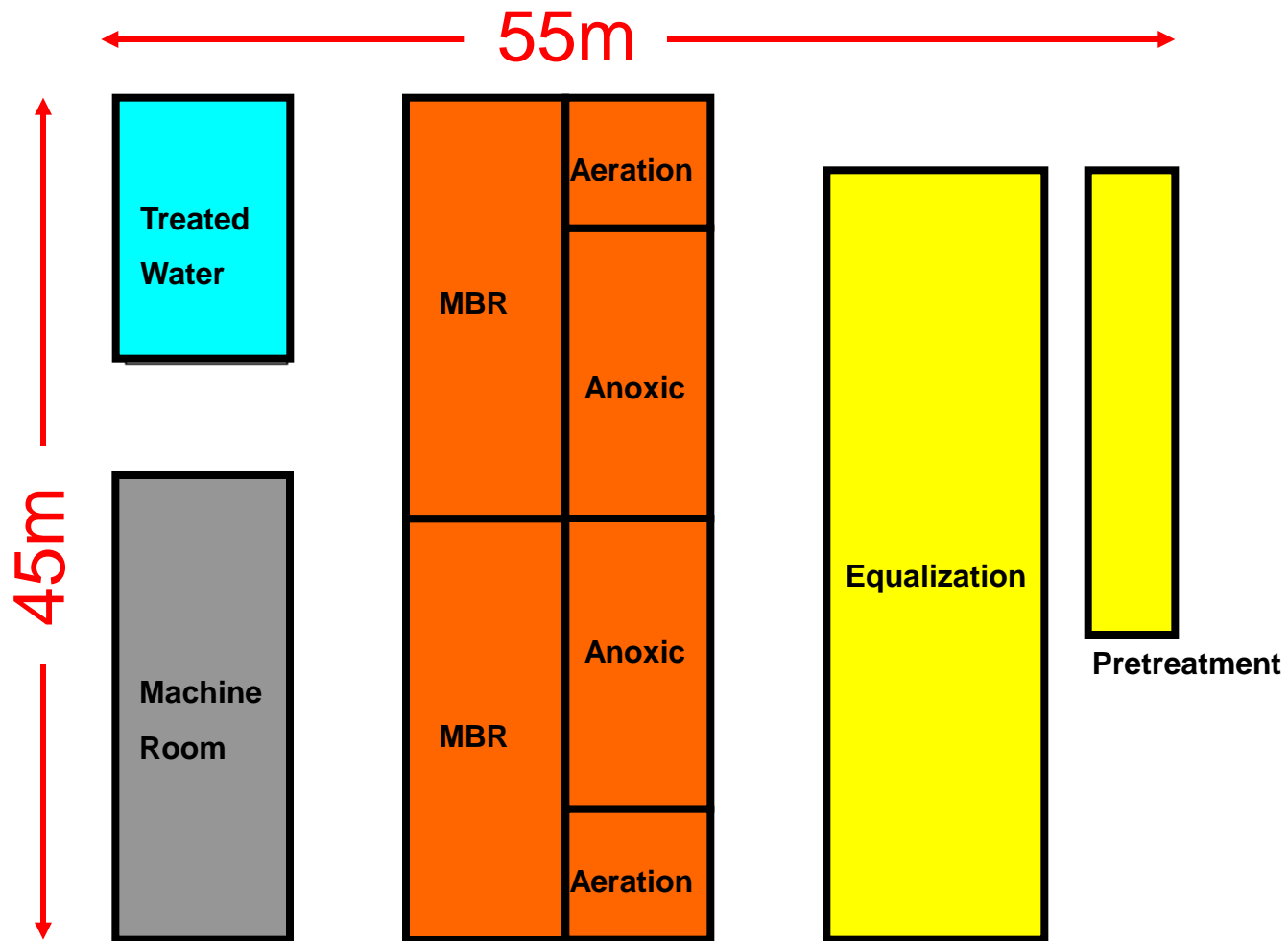
DESIGN FLOW



Tank Volume

	L (m)	W (m)	H (m)	Qty	Capacity (m ³)	HRT (hrs)
Equalization Tank	10	40	2	1	800	2.0
Anoxic Tank	7	15	5	2	1050	2.7
Aeration Tank	7	7	5	2	490	1.2
MBR Tank	8	6	5	6	1440	3.6
Treated Water Tank	8	14	5	1	560	1.4

PLOT PLAN



Equipment List (1)

No.	Name	Quantity (duty-standby)	Description	Dimension W x L x H (m)
1	Coarse screen	2 (1 – 1)	792 m ³ /hr 30 mm opening	0.8 x 1.6 x 2.2
2	Equalization pump	4 (2 – 2)	3.3 m ³ /min x 4 m 15 kW	0.9 x 0.5 x 1.0
3	Equalization blower	2 (1 – 1)	18 m ³ /min x 40 kPa 18.5 kW	1.0 x 1.3 x 1.5
4	Fine screen	4 (2 – 2)	396 m ³ /hr 2.5 mm opening	0.8 x 1.6 x 2.2
5	Aeration blower	3 (2 - 1)	14 m ³ /min x 60 kPa 22 kW	0.7 x 1.1 x 1.4

Equipment List (2)

No.	Name	Quantity (duty-standby)	Description	Dimension W x L x H (m)
6	MBR module	72	200 sheets/unit	1.6 x 0.8 x 4.2
7	MBR blower	3 (2 - 1)	54 m ³ /min x 60 kPa 90 kW	1.2 x 1.8 x 2.3
8	Suction pump	14 (12 - 2)	0.61 m ³ /min x 10 m 7.5 kW	0.5 x 1.0 x 0.7
9	Circulation pump	4 (2 - 2)	9.9 m ³ /min x 6 m 30 kW	1.2 x 0.7 x 1.2
10	Dehydrator	2 (1 - 1)	256 kg-DS/hr	2.2 x 3.2 x 2.9

TORAY MBR (1)

TORAY

New Type Module TMR140 Series

Type No.		100S
Number of Membrane Elements		100
Total Membrane Area (m ²)		140
Housing Size	Width (mm)	810
	Length (mm)	1,620
	Height (mm)	2,100
Material	Housing	304SS
	Permeate Water Manifold	304SS
	Aeration Diffuser	304SS



Membrane Element

Type No.	TSP-50150
Membrane Area (m ²)	1.40
Width (mm)	515
Height (mm)	1608
Thickness (mm)	13.5
Scouring Air (NL/min/EL)	13 - 18

1608

515



TORAY MBR (2)

- **Small footprint**

No need for primary and final settling tank. High MLSS can make biological tank smaller.

- **Better water quality**

The pore size of our membrane is 0.08 micro meter. No SS can go through this membrane.

- **Easy sludge control**

- **PVDF (Polyvinylidene Fluoride) membrane**

PVDF makes this membrane superior in physical strength and chemical stability.

- **Flat sheet membrane**

Only air bubbling from the bottom of membrane prevents sludge adherence. No need for back wash.

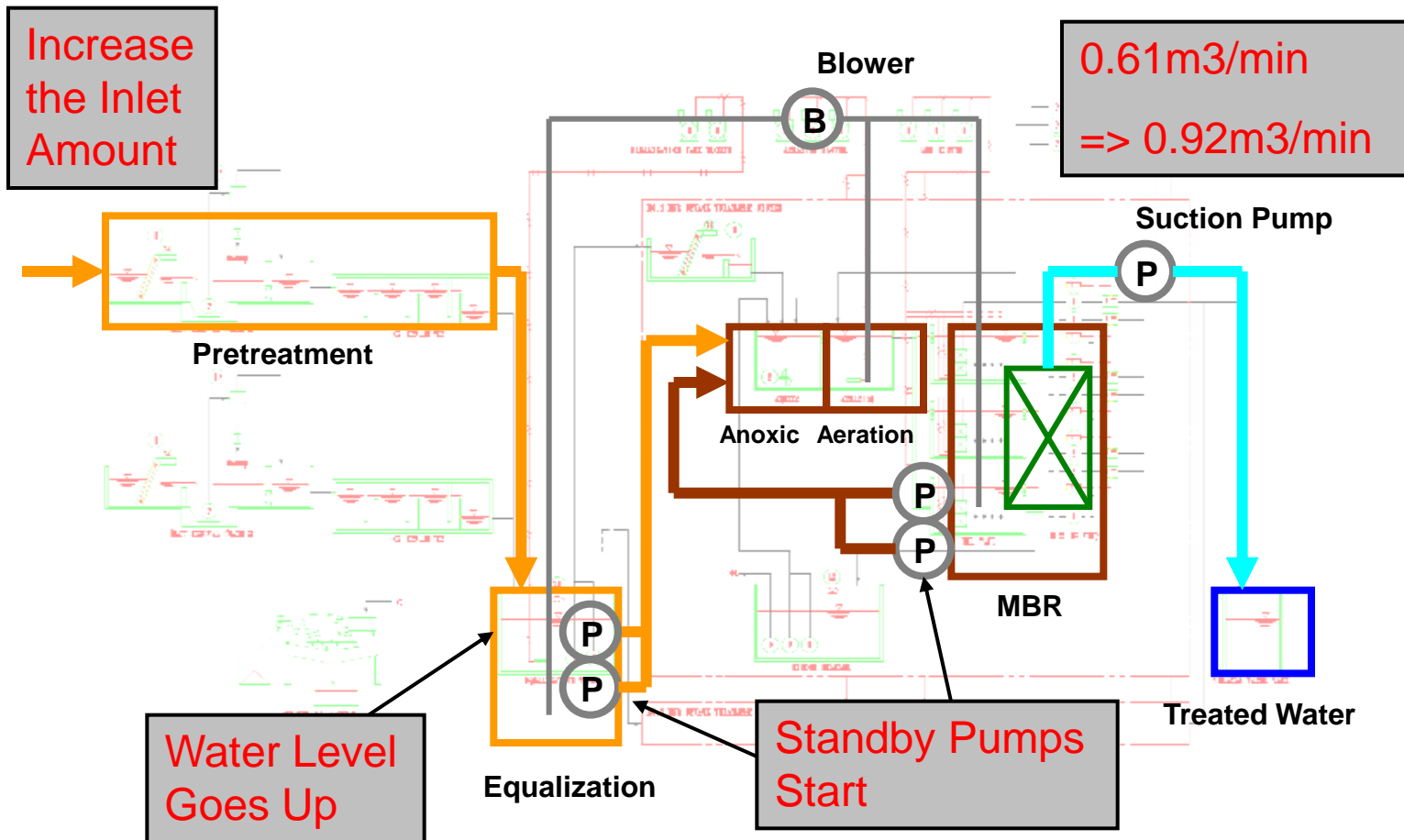


Preparation for the inlet fluctuation

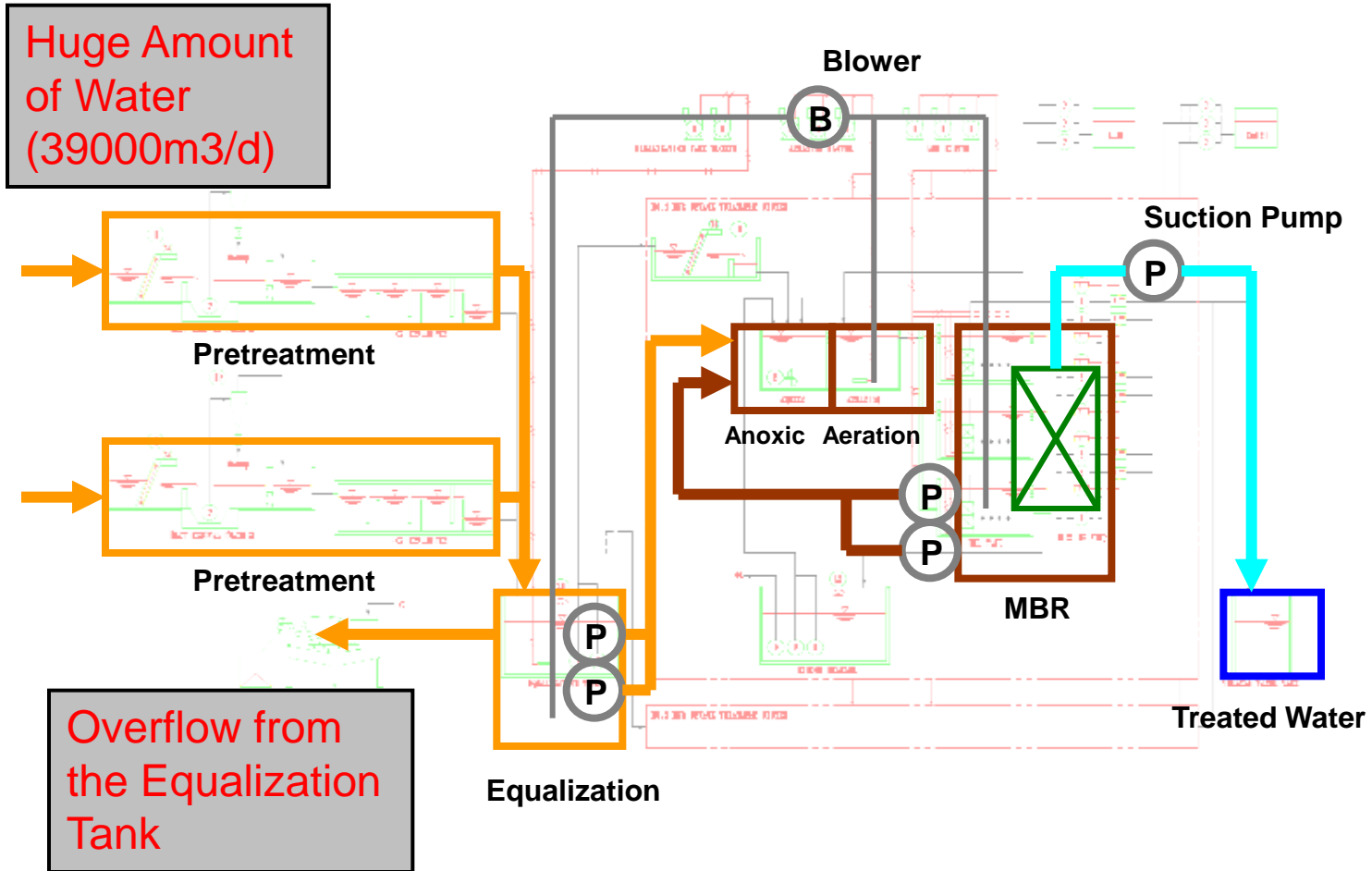
- We have 2 Modes, 'High Mode' and 'Normal Mode'.
- Each mode is selected according to the water level in Equalization tank automatically.



Description of Each Mode



STORM EVNT



Normal Mode (Capacity : 9500m³/d)

- Equalization Pump
: 1 duty, 1 standby (each train)
- Suction Pump Flow Rate
: 0.61m³/min (6 duties / train)
- Circulation Pump
: 1 duty, 1 standby (each train)



High Mode (Capacity : 14250m³/min)

- Equalization Pump
: 2 duties (each train)
- Suction Pump Flow Rate
: 0.92m³/min (6 duties / train)
- Circulation Pump
: 2 duties (each train)



Advantage of Our System

- By circulating activated sludge from aeration tank to anoxic tank, nitrate can be removed, pH value can be held, and stable bio-reaction can be realized.
- Oil and grease sometimes decrease membrane filterability. Oil separator help MBR system work promptly.
- NaOH dosing increases alkalinity and it can realize stable nitrification in aeration tank. There is less $\text{NH}_3\text{-N}$ value in treated water.
- High MLSS and our control system can adapt inlet fluctuation. It can provide good treated water quality.



THANK YOU VERY MUCH

SUIDO KIKO MIDDLE EAST

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