



merito

*packaged
wastewater
treatment plants*

RDA series

Introduction

The RDA series provides an integrated factory assembled wastewater treatment plant based on the proven extended aeration process. The unit is self contained and complete, ready to place on a prepared reinforced concrete foundation slab. Raw domestic sewage is normally collected in an under ground sump from where it is pumped to the inlet of the packaged plant aeration zone.

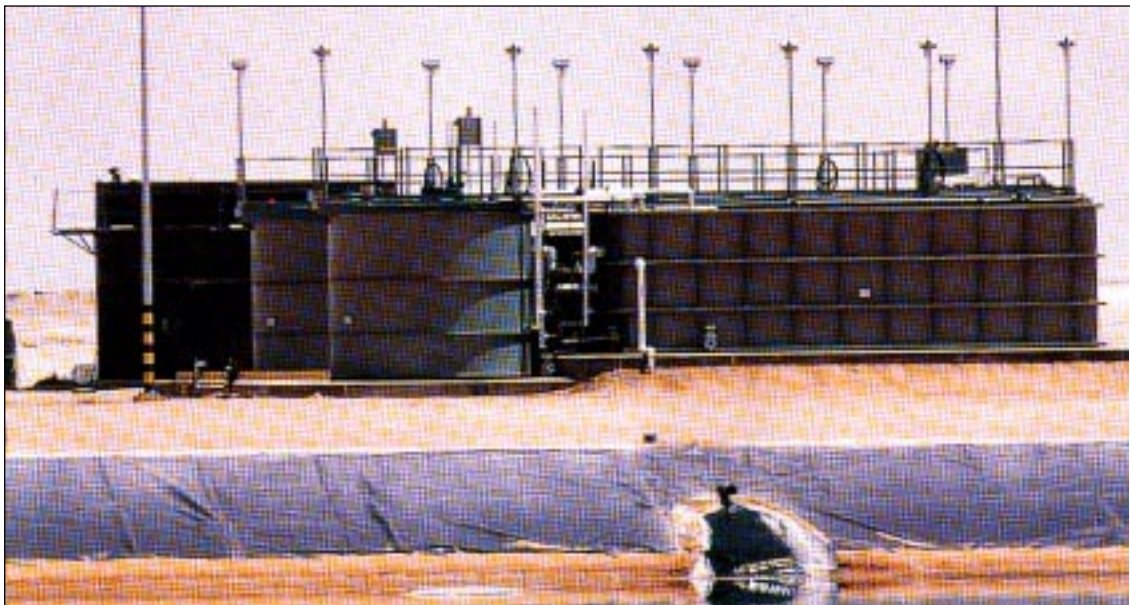
The plant is designed and sized to receive the anticipated flowrate and solids concentration from the specified domestic population to produce an acceptable effluent suitable for re-use as irrigation water or discharge to the municipal sewer system.

The unit can be extended to provide additional facilities such as filtration, disinfection, sludge and effluent storage as desired.

Process

Raw sewage is pumped from the underground well at a controlled rate to the inlet splitter box where spill back weirs proportion the flow to the aeration zone. The biological process is designed to remove a predetermined quantity of suspended and dissolved matter and convert it to a well stabilized sludge; consequently each unit operates best over a certain range. The variations in flow that occur are accommodated by the design range of one third to three times the average flow rate.

The aeration zone volume is based on a nominal 24-hour retention period before the liquor overflows to a settlement tank, where the solids settle out in a conical hopper and the supernatant overflows a peripheral weir to discharge. To maintain the biological process, sludge containing active bacteria is continuously recirculated to mix with the raw sewage at the entry to the aeration zone. To provide the necessary dissolved oxygen for the bacteria, air is fed under pressure through diffusers placed near the bottom of the tank.



RDA Standard Units

Splitter Box

A prefabricated steel, flow proportioning chamber is provided at the wastewater entry to the aeration zone. The chamber is designed to allow a portion of the lift pump discharge to be diverted or returned to the inlet sump. Flow variation is accomplished in the division chamber by positioning the adjustable weir at the desired level.

The flow division chamber is fabricated in 5mm steel plate and painted in pitch epoxy to 300 micron dry thickness.

A bar screen is provided to remove any over size solids from the incoming raw sewage. The bar screen is fabricated from 3mm by 25mm flat bars spaced 25mm apart, and is inclined to facilitate cleaning of accumulated debris to a drying deck.

A sewage macerator (comminutor) can be accommodated in the box, if required, to shred large organic solids.

Blower Units

Two positive displacement motor driven blower units are supplied, each capable of providing the volume of air required for the biological process and airlifts.

The blower is fitted with a dry type filter-silencer at the air intake, and the discharge line is fitted with a check valve, an isolation valve, a pressure relief valve, a pressure gauge, and a flexible rubber discharge connector.



Each blower motor is mounted on a fabricated steel base adequately reinforced to support the blower and the motor unit.

The motor is generously rated for continuous operation, and is of the totally enclosed weatherproof type with class “F” insulation for high ambient temperatures.

Each blower package is furnished with adjustable motor sliderails for ease of adjustment of the “V” belt drive between the blower and the motor.

As an option, each blower and motor can be enclosed within a molded fiberglass, weatherproof enclosure. The fiberglass hood is designed for easy access to service the unit and is equipped with a lifting handle and locking facilities.

RDA Standard Units

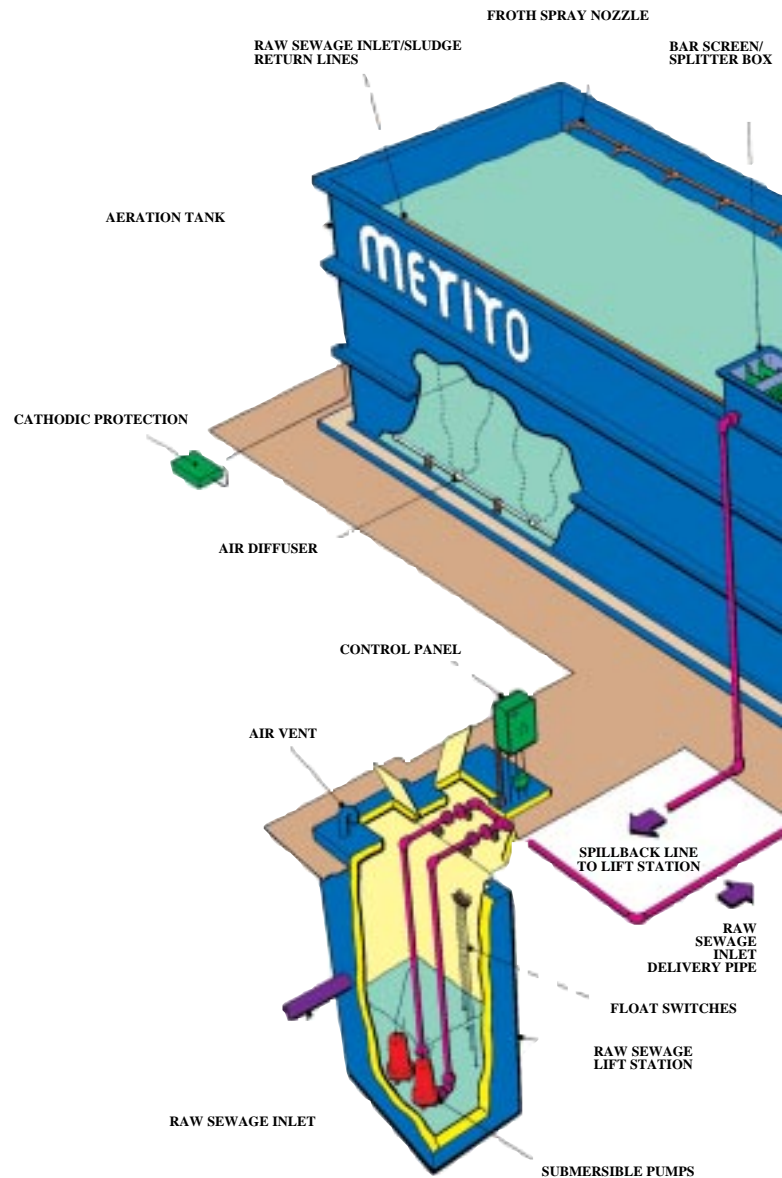
Aeration Chamber

The operating capacity of the aeration chamber is approximately equal to 24 hours throughput at average flow.

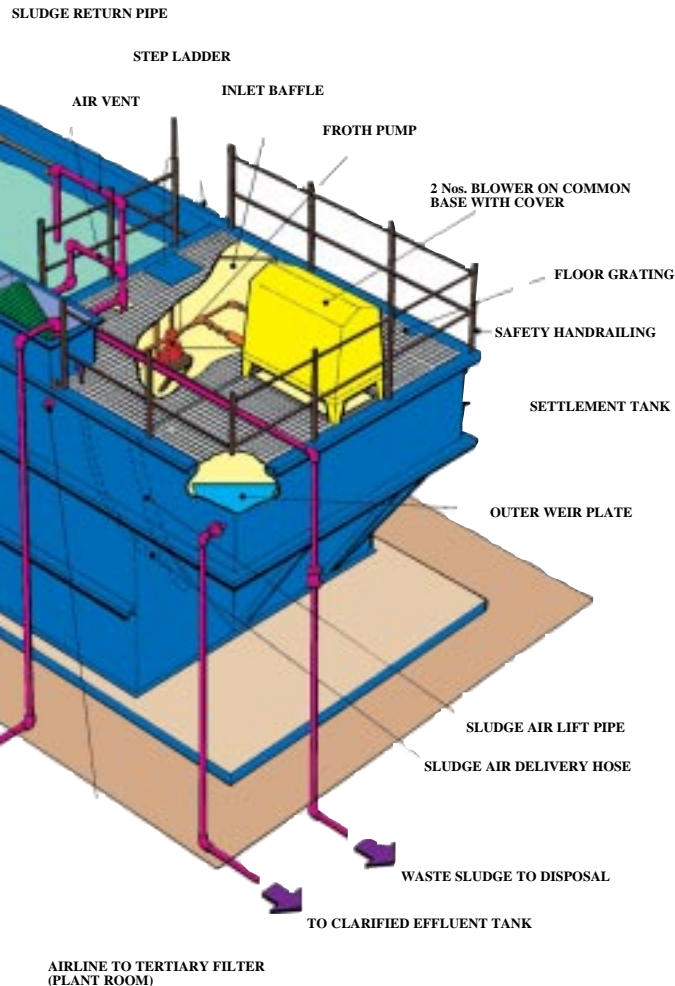
The chamber is rectangular in shape with vertical sides and smooth surfaces to prevent scum and froth accumulation. To ensure maximum retention and eliminate short circuiting by the raw sewage particles, the aeration compartment is fitted with air diffusers placed along one side of the chamber so as to facilitate the spiral rotation of the fluid contents. To ensure an adequate circulation velocity, the proportion of chamber width to depth in the direction of rotation is arranged on an almost 1 to 1 basis. The velocity of rotation is sufficient to scour the chamber bottom and ensure the maximum oxygenation transfer efficiency.

An air distribution manifold is installed along one side of the tank with diffuser drop pipe assemblies connected at intervals. Each diffuser drop assembly is equipped with an air regulating and shut-off valve, a disconnecting union, and a tubular tee bar fitted with nonclog air diffusers. With this arrangement, the air flow per diffuser ranges from 4 to 15 m³/h. The diffusers are parallel to and near the base of the vessel side wall and at an elevation which provides optimum diffusion and mixing of the vessel contents.

The tank is fabricated in steel plate adequately braced and stiffened to prevent deflection, and is designed for placement on a flat concrete foundation.



To service the equipment, open mesh walkways provide easy access to the plant equipment as well as a safe working platform for the system operator.



Clarifier

The clarifier forms an extension to the aeration chamber. The clarifier is fabricated in steel plate to form an inverted pyramidal hopper. The flat bottom of the hopper rests on the concrete base with the sides steadied by rolled steel angle legs as necessary. All flat sides are stiffened and braced to resist buckling.

A positive sludge recirculation system, consisting of a suitable diameter airlift sludge return assembly is installed within the clarifier hopper. The air lift pump system has a recircu-

lation capacity ranging from 0% to 150% of the design flow. The air supply line to the pump is equipped with a control valve to vary the capacity of the pump.

The clarifier effluent passes over the effluent outlet weir into the effluent trough and then out of the chamber. The effluent trough is equipped with an adjustable weir to permit precise levelling after plant installation.

Surface Preparation

All tank surfaces are dressed in a workman like manner so as to provide a smooth and clean surface. Rust, dust, and mill scale, as well as other extraneous matter, are removed by sandblasting, power brushing, or other means to a white surface.

All internal surfaces, other than piping and open mesh, are painted with black pitch epoxy in sufficient coats to give a 320 microns dry thickness. Externally, surfaces are shot blast, cleaned and painted with a suitable shade of epoxy paint.

Handrails

Handrails are provided around the walkways of the wastewater treatment system to service the plant equipment. The handrails are 1100 high, constructed of HTS steel, and located at equal spaces. The handrails are finished with two coats of blue epoxy rich paint.

Electrical Control Panel

An electrical control panel is provided with a weatherproof enclosure for mounting on the operating platform at an easily accessible point. The panel houses all the necessary controls for the proper operation of the plant.

w a s t e w a t e r t r e a t m e n t p l a n t s

Description	Unit	MODEL								
		RDA 20	RDA 30	RDA 40	RDA 50	RDA 60	RDA 70	RDA 80	RDA 90	RDA 100
Average Flow Rate DWF	m ³ /d	20	30	40	50	60	70	80	90	100
Peak Flow Rate	m ³ /h	2.50	3.75	5.00	6.25	7.50	8.75	10.00	11.25	12.50
Population Equivalence	No.	85	130	170	215	260	300	340	390	430
BODS Loading	Kg/d	5.2	7.8	10.4	13	15.6	18.2	20.8	23.4	26
Aeration Volume (Effective)	m ³	20	30	40	50	60	70	80	90	100
Settlement Tank Volume (Effective)	m ³	5.6	7.5	8.3	10.7	12.5	14	15.3	18	19.4
Residence at Peak Flow	h	2.2	2	1.7	1.7	1.7	1.6	1.6	1.6	1.6
Rise Rate at Peak Flow	m/h	0.63	0.71	0.83	0.83	0.9	0.97	1.0	1.0	1.0
Weir Overflow Rate	m ³ /d/m	10	17	20	20	22	23	25	24	25
Air Requirements (@20°C at Sea level)	m ³ /h	40	60	80	100	120	140	160	180	200



wastewater treatment plants



Aeration Tank	Unit	MODEL								
		RDA 20	RDA 30	RDA 40	RDA 50	RDA 60	RDA 70	RDA 80	RDA 90	RDA 100
Surface Area	m ²	7.5	11.25	15	18	21.75	25.5	30	33	37.5
Length	m	3.75	3.75	5	6	7.25	8.5	10	11	12.5
Width	m	2	3	3	3	3	3	3	3	3
Height	m	3	3	3	3	3	3	3	3	3
Plate Thickness	mm	6	6	6	6	6	6	6	6	6
Aeration Drop Pipes	No.	3	3	4	4	5	5	6	7	8
Drop Pipe Size	mm	32	32	32	32	32	32	32	40	40
Aeration Nozzles	No.	4	5	6	8	10	10	12	14	16
Effective Retention (at average flow)	h	24	24	24	24	24	24	24	24	24

Settlement Tank	Unit	MODEL								
		RDA 20	RDA 30	RDA 40	RDA 50	RDA 60	RDA 70	RDA 80	RDA 90	RDA 100
Surface Area	m ²	4	5.25	6	7.5	8.25	9	9.75	11.25	12
Length (max.)	m	2	3	3	3	3	3	3.25	3.75	4
Width (max.)	m	2	1.75	2	2.5	2.75	3	3	3	3
Height	m	3	3	3	3	3	3	3	3	3
Sludge Air lift	mm	63	63	63	63	75	75	75	90	90

The information contained within this brochure is subject to change without prior notice.



Commitment to a
Cleaner
Environment

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