

## PLANT SPECIFICATION - FOR GUIDANCE ONLY

Population	15	18	25	35	40	50
<b>External Dimensions</b>						
Height	2690mm	2690mm	2690mm	2690mm	2690mm	2690mm
Width	1370mm	1370mm	1370mm	1370mm	1370mm	1370mm
Length	3810mm	3810mm	3810mm	5030mm	6250mm	6860mm
Invert Level Inlet	640mm	640mm	640mm	640mm	640mm	640mm
Invert Level Outlet	740mm	740mm	740mm	740mm	740mm	740mm
Ground Level To Inlet Invert	1900mm	1900mm	1900mm	1900mm	1900mm	1900mm
Base Of Plant To Ground Level	2540mm	2540mm	2540mm	2540mm	2540mm	2540mm
Compressor Blower	Internal	Internal	Internal	External In Kiosk	External In Kiosk	External In Kiosk
Power Consumption	280w	280w	280w	1.1KW	1.1KW	1.1KW
Treatment Capacity	10872 litres	10872 litres	10872 litres	14500 litres	18000 litres	20000 litres
Effluent Quality	20:30:20	20:30:20	20:30:20	20:30:20	20:30:20	20:30:20
Design Hydraulic Flow	3000litres	3600litres	5000litres	7000litres	8000litres	10000litres
Design Organic	900g/day BOD	1080g/day BOD	1500g/day BOD	2100g/day BOD	2400g/day BOD	3000g/day BOD
Gravity System	Standard	Standard	Standard	Standard	Standard	Standard
Nominal Retention Time	85 Hours	80 Hours	80 Hours	55 Hours	55 Hours	52 Hours
Desludging Interval-Full Loading	60-90 Days	60-90 Days	60-90 Days	60-90 Days	60-90 Days	60-90 Days
Weight Empty (approx.)	995 kg	1000 kg	1000 kg	1200 kg	1400 kg	1400 kg
<b>Manway Dimensions 1200x620x250mm</b>						
<b>Electricity Supply Single Phase 240/50</b>						
<b>*Design Hydraulic Flow=litres per day DWF</b>						

Population	75	100	125	150	175	200
<b>External Dimensions</b>						
Height Tank A	2690mm	2690mm	2690mm	2690mm	2690mm	2690mm
Height Tank B	2690mm	2690mm	2690mm	2690mm	2690mm	2690mm
Height Tank C	N/A	2690mm	2690mm	2690mm	2690mm	2690mm
Width Tank A	1370mm	1370mm	1370mm	1370mm	1370mm	1370mm
Width Tank B	1370mm	1370mm	1370mm	1370mm	1370mm	1370mm
Width Tank C	N/A	1370mm	1370mm	1370mm	1370mm	1370mm
Length Tank A	3810mm	4420mm	5640mm	6250mm	7470mm	8080mm
Length Tank B	6250mm	4420mm	5640mm	6250mm	7470mm	7930mm
Length Tank C	N/A	3810mm	4420mm	5030mm	5640mm	6250mm
Invert Level Inlet	640mm	640mm	640mm	640mm	640mm	640mm
Invert Level Outlet	740mm	740mm	740mm	740mm	740mm	740mm
Ground Level To Inlet Invert	1900mm	1900mm	1900mm	1900mm	1900mm	1900mm
Base Of Plant To Ground Level	2540mm	2540mm	2540mm	2540mm	2540mm	2540mm
Compressor Blower	External In Kiosk	External In Kiosk	External In Kiosk	External In Kiosk	External In Kiosk	External In Kiosk
Power Consumption	1.1KW	1.8KW	2.2KW	2.2KW	2.2KW	2.2KW
Treatment Capacity	28970 litres	29970 litres	45300 litres	50700 litres	59800 litres	65224 litres
Effluent Quality	20:30:20	20:30:20	20:30:20	20:30:20	20:30:20	20:30:20
*Design Hydraulic Flow	15000litres	20000litres	25000litres	30000litres	35000litres	40000litres
Design Organic	4500g/day BOD	6000g/day BOD	7500g/day BOD	9000g/day BOD	10500g/day BOD	12000g/day BOD
Gravity System	Standard	Standard	Standard	Standard	Standard	Standard
Nominal Retention Time	52 Hours	52 Hours	50 Hours	45 Hours	46 Hours	44 Hours
Desludging Interval-Full Loading	60-90 Days	60-90 Days	60-90 Days	60-90 Days	60-90 Days	60-90 Days
Weight Empty (approx.)	2200 kg	3500 kg	3800 kg	3900 kg	4300 kg	4500 kg
<b>Manway Dimensions 1200x620x250mm</b>						
<b>Electricity Supply Single Phase 240/50</b>						
<b>*Design Hydraulic Flow=litres per day DWF</b>						

**Marsh Industries Limited**

Etruria House

Brightwell Walk

Irthlingborough

Northamptonshire NN9 5PJ

Email: [sales@marshindustries.co.uk](mailto:sales@marshindustries.co.uk)

[www.marshindustries.co.uk](http://www.marshindustries.co.uk)

**ORDER HOTLINE 0044 (0)1933 653570**

MARSH

SEWAGE TREATMENT

SEWAGE TREATMENT

SEWAGE TREATMENT

MARSH

SEWAGE TREATMENT

SEWAGE TREATMENT

SEWAGE TREATMENT

### Marsh Uni:Sewage Treatment Systems

Treatment systems for small communities, business, leisure centres and hotels

Uni:15 to Uni:200 (P.E. 15 – 200).

Marsh Uni: Sewage Treatment Systems: For properties without access to mains sewers.

#### Biological Aerated Filtration (BAF) systems.

Marsh sewage treatment plants incorporate the BAF process to treat sewage from small communities, hotels, leisure centres etc. The BAF process is a development of the well proven trickling filtration process. During shock loading, the microorganisms are not flushed from the system, since they are contained in the biofilm. As with all sewage treatment plants care should be taken to ensure that oil or grease does not enter the system.

#### Advantages Of The Marsh Uni: Sewage Treatment Plants

- 1 High standard of final effluent quality that meets the standard detailed in BS6297:1983 (20:30:20)
- 2 The sewage treatment plant ensures the liquor is passed through the media regularly resulting in improved solids breakdown
- 3 Ability to function under conditions of shock loading
- 4 Low noise pollution
- 5 Possibility of nitrification and denitrification
- 6 Low running costs
- 7 Minimal visual impact, total below ground installation
- 8 Reduced maintenance



## Marsh UNI:15 to UNI:200 Sewage Treatment Plant

Engineered from high performance SMC.  
With High Impact Performance with  
flexural and tensile strength



[www.marshindustries.co.uk](http://www.marshindustries.co.uk)

Email: [sales@marshindustries.co.uk](mailto:sales@marshindustries.co.uk)

SEWAGE TREATMENT

SEWAGE TREATMENT

WASTE SEWAGE

SEWAGE TREATMENT

MARSH

SEWAGE TREATMENT

SEWAGE TREATMENT

SEWAGE TREATMENT

## The Process

Untreated sewage is received through the inlet pipe to the Primary Settlement Chamber, where the sludge settles on the base of the chamber. The sludge remains until the tank is "de-sludged".

The settled liquid travels from the primary chamber and flows into the biological treatment chamber. Incoming flow mixes with the other recycled liquids in this chamber. The pump is located in a separate chamber. Wastewater is pumped through the pipe and under the media at the bottom of the tank, using a baffle system. Air and the aerated water circulate continuously within the system, creating an environment for micro-organisms to treat and purify / clean the wastewater.

The humus solids settle to the bottom of the system to form a sludge, which is intermittently returned. However, sludge will remain within the tank and requires desludging. The fully treated water/liquid leaving the final settlement chamber, known as final effluent, is suitable for discharge to a watercourse or soakaway.

## Primary settlement.

Primary settlement tanks are used to settle out solids. In smaller systems they reduce the loading on subsequent biological treatment stages. Where screening is not employed, they remove materials which would interfere with or inhibit subsequent treatment stages. The settled liquor that is between the sludge and crust passes for treatment into the Biological Aerated Filtration Chamber.

## Biological treatment chamber

Bacteria require oxygen which is supplied through low pressure compressor blowers, diffusers through porous membranes. The bacteria feeds on the settled sewage which further reduces the Biological Oxygen Demand, Suspended Solids and Ammonia levels.

The media can consist of large plastic structured modules (150 to 500 m<sup>2</sup>/m<sup>3</sup> surface area), plastic granules (4 to 10mm size) or natural granular materials (2 to 10mm size); the structured media with low surface area may not require backwashing. Media with larger pores should be used for carbonaceous oxidation – thick biofilms are synthesized during this process – in order to avoid clogging; the biofilms synthesized by nitrification are quiet thin and should not cause clogging problems. Physical filtration can occur along with any biological reactions as the wastewater flows through the media. Denitrification can take place if the aeration of the media is eliminated and an anoxic zone is created; the anoxic zone is usually placed immediately after the primary settlement tank and receives both the wastewater from the primary tank and the returned nitrified wastewater..

## Final (secondary) Settlement Chamber.

As the bacteria dies it falls away from the media and is then passed to the final settlement chamber. Here the effluent settles, further improving the final effluent quality. Secondary settlement tanks (clarifiers) are installed following secondary treatment to settle out biomass cells, which are produced during secondary treatment. In activated sludge systems, this settled sludge needs to be continuously returned to the aeration tank, with some of the sludge being wasted periodically from the system.

## Kiosks:

### Air blower and Control Panels (optional) and access.

Monitoring equipment will be placed into the system, or in a separate housing or kiosk. The Kiosk contains the air pump, alarm equipment etc. This lockable Kiosk can be fitted with visual / audio / phone alarms.

Only qualified personnel are allowed to hold a key this kiosk. Mains must be disconnected before maintaining the system. The Kiosk should be fenced off, in a lockable compound along with the Marsh sewage treatment system.

## Access.

Manways allow access into the wastewater treatment system. These are lockable manways (Padlocks not included) and depending on the size of the system, there may be three or more.

Never enter the system. Only qualified personnel are allowed access into the system, and even then, certain Health & Safety precautions must be adhered to.

## Plant Specification

The tanks are designed to be installed below ground with the inlet pipe, no deeper than 1m from ground level. Our system is supplies to suit these conditions. If the actual drainage system is lower, the access turrets will be required to be altered. Ground water should never rise higher than 2.5m above the bottom of the tank.

## Concrete Specification

The concrete specification for the concrete mix to surround the tank can be taken from BS 5328 : Part 1 : 1991 and its amendments. However, site conditions and application requirements must be noted. Typical non-structural application, in non aggressive soils, a standard mix ST4 with a 50mm slump is generally suitable. Also permits the equivalent Designated Mix GEN3 to be specified as an alternative. If for non typical applications, structural or other reasons a higher than normal designation is required, the purchaser of the fresh concrete can use table 6 in BS 5328: Part 2: 1991 (amendment 8759/October 1995) for guidance. Concrete specifications, installation, etc are the sole responsibility of others

## Loadings

The system is designed not to take a loading except man weight. Vacuum tankers/cars etc must never be allowed onto the tank. If the tank is installed in an area where traffic or other superimposed loadings can be applied, a structural engineer must be consulted, for the design of a reinforced concrete slab to prevent the load being transmitted to the tank (or its concrete surround). If this slab is constructed immediately above the tank, it should be separated from the concrete surrounding the tank by a compressible material.

## Ventilation

Good Ventilation is crucial to the system. Prior to installing the system, great care must be given, on how to provide adequate ventilation. As sites differ, advice is available from BS8301 or BS6297.

## Kiosks:

The air blower and monitoring equipment will be placed into a separate kiosk or housing. This lockable kiosk can be fitted with visual/audio/phone alarms along with the Air-Blower.

The air blower in the kiosk will have a plug and socket, and this socket must be wiring up to a mains supply. Only a properly qualified and competent person should attempt to do this wiring. Only qualified personnel are allowed to hold a key this kiosk. Mains must be disconnected before maintaining the system. The kiosk should be fenced off in a lockable compound along with the sewage treatment system. This kiosk will in general be dispatched with the system unless otherwise specified.

## Kiosk: Location

The kiosk should be located not more than 7 meters from the system, on the side of the system with the 4" hole/s.

Kiosk dimensions approx. 1.1m high x 0.77m wide x 0.45m deep.

The base of the kiosk has an opening dia 100mm to accommodate the PVC pipe work. which will terminate here.

### Kiosk: Installation

The kiosk has two "retaining feet" and is normally laid in wet cement. Ensuring that you are a maximum of 7 meters from the system, prepare a suitable location. Excavate 1.2 meters x 1.2 meters to a depth of 150mm and pour a base or wet cement Grade 25N or appropriate to 100mm.

Gently place the kiosk onto the cement. Ensure that the kiosk is level in the cement. Cover the excavation, carefully covering the retaining legs, and hunch up 30mm maximum, up around the base of the kiosk. Do not cover more than 30mm as the door opening must not be interfered with. Alternatively, the kiosk can be rawl bolted to a concrete plinth.

### Electrical Installation of the unit.

All electrical work to be carried out by competent person using suitable materials for the application.

The cable armor must be properly bonded to the main earth at the premises.

A control panel with alarm is available. Please refer to the manufacturer for further details.

Once commissioned, never disconnect the power to the air pump. It is imperative that it is running 24 hours a day, every day.

### Alarm options.

Various alarm systems, to a variety of different standards & specifications are available from the manufacturer. Phone alarms are also available as an optional extra. Note: the alarm option used, may require a variation in the electrical connections used.

**Plumbing the system and percolation trench characteristics. Further details are available from Marsh.**

### System start-up

The electrical connections must be completed prior to commissioning.

The manufacturer's electrical instructions must be adhered to at all times as outlined in this handbook.

The system must be powered on.

The system must be full of water to inlet/outlet levels.

The system must be commissioned prior to use. No sewage should be allowed to enter the primary settlement tank.

Once commissioned, the system will be checked, that it is working correctly and the aeration chamber functioning correctly.

Once the Marsh sewage treatment system is operational, the clarification process can begin. This requires growth of microorganisms in the Biological Treatment chamber. In general approx two months is required for the naturally occurring organisms to develop, but this time may increase substantially in winter time due to lower temperatures.

Temporary shut down of the Marsh sewage treatment system.

The treatment system may be shut down temporarily and the absence on a temporary basis will not be detrimental to the system. However, the plant may require maintenance prior to long periods of interruption.

In accordance with Marsh Industries Ltd.'s normal policy of product development, this specification is subject to change without notice. All sales are subject to Standard Contract Conditions, available on request.

