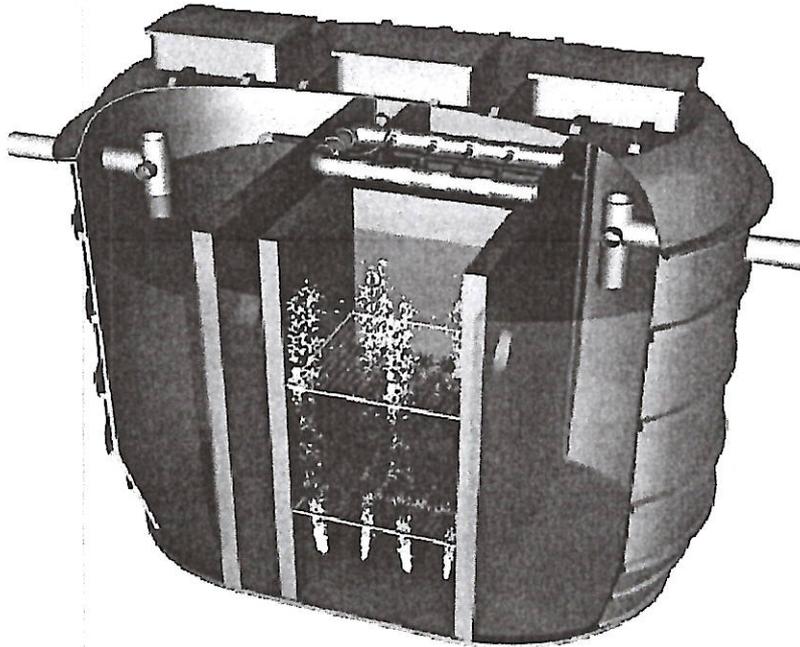


# We Build It Ltd

*simple solution sewage systems*

## Flowpath Sewage Treatment System



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## **Installation Guidance Notes – Concrete Surround**

Note : These guidance notes refer only to the installation of concrete surround underground tanks. These guidance notes do not provide specific, site-related installation instructions. If in any doubt whatsoever about any aspect of the installation, please contact **We Build It Ltd 01746781782**

### **Service Specification**

Our tanks are designed to be installed below ground and surrounded with concrete. Generally, the depth from finished ground level to the top crown of the main shell should be no more than 2 metres. This may vary dependent upon ground water conditions. Deeper inverts may be accommodated on a standard shell, providing the water table level does not exceed 2 metres above the top crown of the main shell. For deeper burial with high water table conditions heavy duty shells are available.

**Should you be in any doubt regarding suitable shell application please call our Technical team on 01746 781782**

If the tank is installed outside these parameters, it may suffer irreparable damage.

### **Concrete Specification**

The specification for the concrete mix to surround the tank may be taken from BS 5328:Part 1:1991 (including amendments), taking into account site conditions and application requirements. For a typical non-structural application in non-aggressive soils a standard mix ST4 with a 50mm slump is generally suitable, but 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 may use table 6 in BS 5328:Part 2:1991 (amendment 8759/October 1995) for guidance.

### **Lift height (rate of rise)**

Determine the lift height (m), or rate of rise (m/h) for the specific concrete type used, to ensure that a design pressure (***P max***) of **15kN/m<sup>2</sup>** on the tank is not exceeded.

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### **Vibration**

The design of the tank assumes minimal compaction of the surrounding concrete. Where necessary, this may be extended to include light internal vibration. **Never** use deep re-vibration which will substantially increase the pressure on the tank, possibly causing failure.

### **Impact of Concrete on Discharge**

The effects of impact on discharge are considerable. These are controlled by the vertical form height, the tank diameter and the method of discharge. Under no circumstances should concrete be discharged directly onto the tank.

### **Loadings**

If the tank is installed in an area where traffic or other superimposed loadings can be applied, consult a structural engineer 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.

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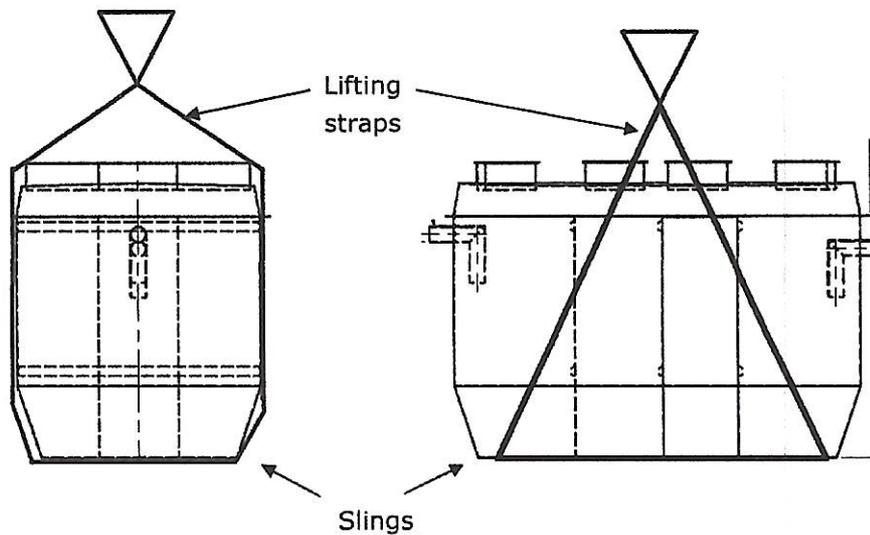
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### **Transportation, unloading and storage of tanks**

1. Tanks must be held down during transportation using nylon straps, do not use cables or chains to hold tanks.
2. Do not over tighten straps to cause deformation of the tank shell
3. Tanks are best lifted by crane and webbing lifting straps – do not use chains or wire ropes in contact with the tank.
4. We Build It Ltd recommends the use of a lifting beam for tanks longer than 8 metres.
5. Smaller tanks may be lifted with other suitable site equipment, however greater care is required to control the lift and to ensure that the tank is not damaged.



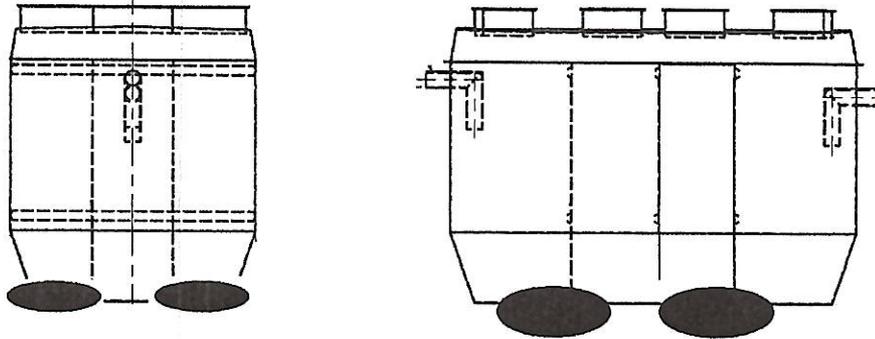
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1. Move tanks only by lifting and setting down. Do not drag and roll.
2. Do not drop or roll tanks from truck.
3. Place tanks carefully onto a smooth level even surface, free from rocks, larger stones or other debris that could cause point loads.
4. Chock tanks using tyres, sandbags (or similar) to prevent rolling.



5. In high wind conditions, consideration should be given to strapping down the tanks to prevent damage.

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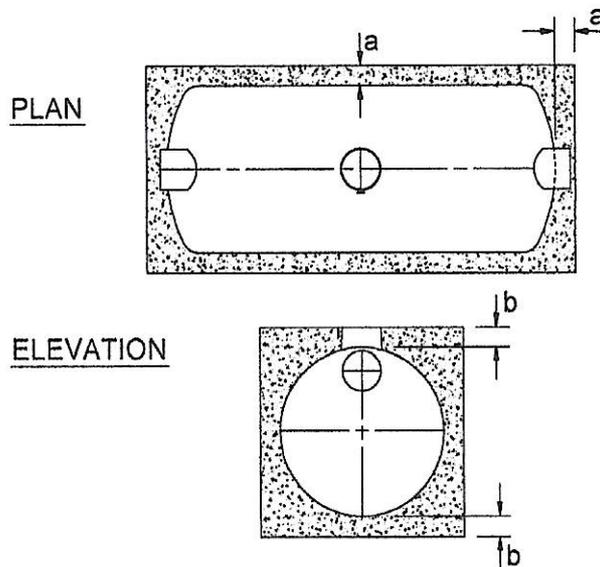
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**Pre-Installation Inspection**

1. Tanks should be subject to a visual inspection prior to installation.
2. Special consideration should be given to lifting strap positions.
3. Any damage should be notified to the delivery driver and to We Build It Ltd.
4. Do not attempt to carry out any unauthorised repairs, as this will invalidate the Warranty on the tank.
5. Check for, fractures to the shell or ribs, de-laminations, scratches or abrasions deeper than 1.5mm, stress cracks or star crazing.
6. Check invert depth is correct, and that the inlet and outlet pipe orientation is correct.

Installation procedures must be in accordance with the Health and Safety at Work Act 1974, and other relevant legislation. Your procedures must also align with good building practice.



Tank Diameter (mm)	'a' min (mm)	'b' min (mm)
1000	150	150
1200	150	150
1500	200	200
1800	250	250
2500	300	300
3000	300	300
4000	350	300

**Table 1**

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1. Excavate for the tank, allowing sufficient clearance for the minimum concrete surround thickness as shown in table 1 (see previous page), whilst also considering any shoring / trench supports used. The depth of the excavation is determined by the inlet and outlet pipe invert levels relative to the bottom of the tank and allowing for the minimum base thickness shown. Dimensioned details of the separator can be taken from the relevant drawing. Ground instability at formation level e.g. running sand, may necessitate over-excavation and stabilisation with hardcore or blinding concrete.

**NOTE: Check that the depth to the base slab is within the service specification requirements for the tank.**

2. Maintain a completely dry excavation until the final pour of concrete has set. Failure to do this may result in voids beneath the tank and subsequent tank failure.
3. Pour concrete into the bottom of the excavation to form a level and smooth base onto which the tank can sit. This should be to the minimum thickness given in the table above.
4. Place the tank onto the concrete base, while the concrete is still wet, and determine the correct orientation for the tank inlet(s) and outlet(s), i.e. the higher pipe on the tank is to be connected to your upstream (inlet) pipe work and the lower pipe on the tank is to be connected to your downstream (outlet) pipe work. Connect and seal your pipe work to the tank, checking alignment, and ensure that there is an adequate and correct fall for each pipe.
5. Fill each chamber of the tank with clean water to a depth of 300mm and re-check the pipe work levels. Commence backfilling evenly around the tank with concrete ensuring there are no voids, particularly at the bottom of the tank shell. Continue filling the chambers with water whilst evenly backfilling with concrete, ensuring that the progressive water level is no more than 300mm above the concrete level.
6. Connect and seal turret extensions prior to completing the concrete encasement of the main tank to the height shown in table 1. Allow this concrete to set.
7. Using appropriate formwork, continue to pour concrete around the tank superstructure (i.e. bypass chamber, access turrets) in lift heights not exceeding 500mm, allowing initial set between each lift.

NOTE: Never increase the lift height or accelerate the rate of rise for the

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concrete type used or allow the concrete to be compacted to an extent which will cause any part of the tank superstructure to distort. If you contravene this warning you will cause damage to the tank.

8. Complete backfill to ground level using free flowing material. Trim all access turrets and prepare suitable footings for each manhole frame ensuring that any loads on the covers are not transmitted to the tank access turrets or access extensions, if fitted.

### **Control of Groundwater**

Tanks must not be subjected to buoyant forces during installation. Consider ground water levels and surface water run-off, and their accumulation in the tank pit, even if tanks are anchored.

The excavation should remain dry by pumping or other suitable means until the concrete surround is cured.

### **Access Shaft Extensions**

Access extensions shall be surrounded with concrete poured in 500mm lifts allowing initial set between each lift. The pressure from concrete placed in higher lifts may cause access extensions to distort or collapse.

Please note that loose shafts should be sealed using silicon sealant Sikaflex -291 or similar prior to installation to prevent ingress of groundwater under high water table conditions. It is the contractor's responsibility to ensure a watertight seal.

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**The FlowPath Treatment System**  
**Operation and Maintenance Manual.**

**Index.**

1. Flowpath Introduction
2. Plant Operation
3. Fault Finding/StartUp
4. Service agreements
5. General Notes

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## Flowpath Introduction

The FlowPath range of SAF treatment plants uses extended aeration in a 3-stage process.

- Primary and Sludge Settlement Zones
- Biological Treatment Zone
- Final Settlement Zone

See Fig 1

The tank configuration can be either a single, semi-modular or modular GRP tanks.

- A single tank contains all 3 zones
- Semi-modular contains one tank used for the primary and sludge settlement zones and another tank for Biological process zone and final settlement zone.
- Modular uses 3 tanks, one primary/sludge, one tank Biozone and another tank for final settlement.

### **Primary and Sludge Settlement Zones.**

The purpose of this zone is to receive incoming waste water, the incoming flow is settled reducing the load entering the Biozone, and the sludge must be removed periodically.

### **Biological Treatment Zone.**

The Biozone is divided into compartments depending on the size and configuration of the treatment plant. Each compartment contains plastic media which allows for an aerobic bacterial colony to establish. With the introduction of air through fine bubble diffusers the bacteria or biomass treats the incoming waste water and digest the organic matter. The fine bubbles also remove any excess solids from the media, maintaining continuous growth and an efficient affective process.

### **Final Treatment Zone.**

As the name suggests this is where any small particles/solids are settled out prior to final clarified effluent being discharged, a small quantity of settled effluent from the final settlement zone is periodically pumped back into the primary zone for further digestion.

The biological process occurs naturally and takes around 4-8 weeks to establish depending on consent levels, temperature (time of year) and flow loading.

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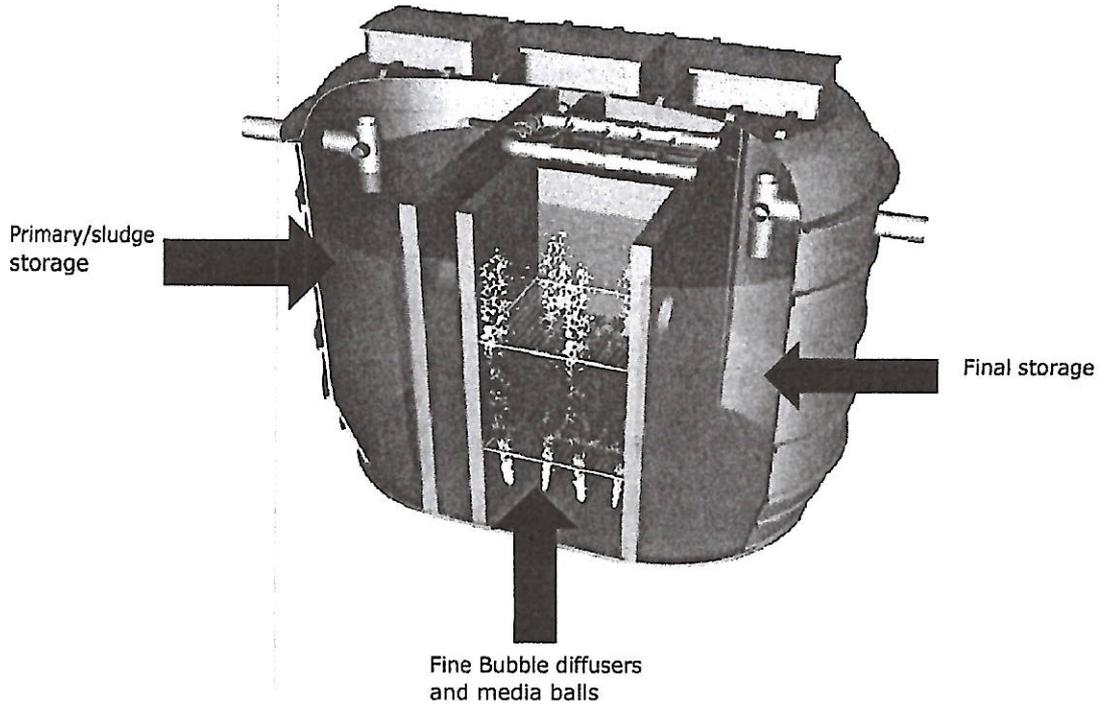
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Fig 1

**Diagram of Flowpath**



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## **Plant Operation**

The plant is designed is designed to operate within the parameters of British Water flows and loads 4 and should operate with minimum maintenance providing the plant is not abused in any way (see general notes)

The side channel blower is an integral part of the process, providing air to the bacterial colony, the blower must be maintained as it is under continuous operation. The plant should be checked weekly (air pump) and serviced twice yearly by a competent treatment plant engineer.

### **Weekly Checks**

Check for noisy blower this can be a sign the blower is not operating correctly.

### **Six Monthly Checks**

Open the kiosk and check blower filters are in good condition, replace if necessary.

Check control panel and electrical connections are in a sound condition.

Check air vents and louvers into the kiosk are clear and free from debris.

Check the sludge depth, the floating sludge should be no thicker than 150mm and the settled sludge should be at least 1 meter below the top water level.

Open Bio Zone lids and check that there is an even distribution of bubbles across the surface of the tank, if there are any dead areas check the function of the diffusers and replace if necessary. (DO NOT WALK ON GRID; THIS IS TO KEEP MEDIA IN POSITION)

Pass all the air through each chamber in turn to remove excess biomass.

Check the timing of the return pumps from the final tank to the primary tank this should

be If one pump is fitted:

- Pump - 3 minutes on, 45 minutes off

If two pumps are fitted:

- Pump 1 - 3 minutes on, 45 minutes off
- Pump 2 - 3 minutes on, 60 minutes off

Check the quality of the final effluent. This should be clear with very few solids. Any floating solids can be removed when desludging the unit or removed and put back into the primary/sludge settlement zone. De-sludge if necessary.

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### Yearly Checks

As 6 months checks plus;

Overhaul of air blower in accordance with manufacturers O&M manual.

Removal of any scum/grease build up with a pressure washer if you need to scrape away any build up use plastic or wood, never use metal on the GRP tank, this will damage the integrity of the tank.

**NOTE- ENSURE ALL OPEN HATCHES/MAN WAYS ARE ADEQUATLY BARRIERED OFF FROM THE PUBLIC OR OTHER PERSONS IN THE VERSINITY OF THE PLANT.**

### The Do's and Don'ts of the Flowpath Treatment System

We recommend that you follow these do's and don'ts guidelines to ensure that the Flowpath runs smoothly. Remember that bacteria live, in the Flowpath to break sewage down- if you kill off the bacteria the Flowpath will not run as efficiently as possible

In our opinion we find bio products are expensive and not very effective at cleaning. Normal products can be used but needs to be used in small and sensible doses- this needs to be enough to clean your sanitary wear, but not enough to clean the treatment plant, as mentioned the Flowpath uses bacteria to work.

#### **DO**

- ✓ **Try to stick to the same brands of cleaning products.** Your unit will become quite tolerant to the brands you use
- ✓ **Use liquids instead of powders e.g. washing and dishwasher.** Liquids are kinder to the bacteria in the unit
- ✓ **Spread out your washing through the week.** Don't have a 'washing day'
- ✓ **Consider washing with 'Ecoballs'.** \* They work very well and contain no detergent or phosphates, great for your sewage unit (and for allergies). [www.ecozone.co.uk](http://www.ecozone.co.uk)
- ✓ **Service your FlowPath twice a year.** It only takes about 1 hour, and will keep your tank functioning properly
- ✓ **Keep the lid of the FlowPath accessible.** It will be easier for servicing and pumping
- ✓ **If you experience a problem, call us or a professional.** Only let experts look after your unit
- ✓ **Fix leaky faucets (Taps)** This will cause more water to flow into the system

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## DON'T

- ☒ **Throw medicines down the sink/toilet.** Antibiotics will kill your unit
- ☒ **Empty large amounts of detergents and bleach down the sink/loo.** Pour the buckets down your outside drains, as these are not connected to the unit
- ☒ **Allow anti-bacterial substances, (hand wash, dettox, etc) to enter the unit.** These will KILL the unit. Apply the products with kitchen towels and throw them in a bin
- ☒ **Pour sterilizing fluids (Milton, etc.) down the sink.** These will KILL the unit
- ☒ **Pour milk down the sink.** The BOD of milk is too high, and the bacteria will suffer
- ☒ **Put sanitary items, nappy liners, baby wipes, cotton wool, etc. down the toilet.** Cotton wool 'shreds' when wet, is very slow to degrade and blocks everything
- ☒ **Empty cooking oil down the sink.** The oil will coat and smother the friendly bacteria in your unit
- ☒ **Allow a 'hot tub' or 'spa' to discharge into this unit.** The volumes are too great and will flush untreated sewage through your unit. If chlorination is used, this will also KILL the bacteria in the unit
- ☒ **Empty home-brew residues down the sink.** Yeasts will take over your unit!
- ☒ **Install a waste disposal unit.** The unit would need to be three times the size to digest the additional organic waste produced

If you are still unsure or have any questions regarding these guidelines and using the Flowpath correctly please do not hesitate to contact us.

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## Fault Finding/Start Up

### Pumps and Compressors not running

Problem	Correction
Power cut	OK if power returns within 48 hours otherwise us an alternative power supply or tanker waste
Supply Fault	Check all connections, fuses or RCD'S (competent electrician)
Broken Blower	Replace or repair blower
Broken Pump	Replace or repair pump
Tripped	Reset any RCD's or overloads

### Poor Effluent Quality

Problem	Correction
Compressor failure	Check power to compressor and replace or repair if necessary
Broken Blower	Replace or repair blower
Tripped	Reset any RCD's or overloads
Compressor running	Check for leaks, check diffusers, check for blockages in the air supply

### No Aeration in Bio Zone

Problem	Correction
Compressor failure	Check power to compressor and replace or repair if necessary
Broken Blower	Replace or Repair blower
Tripped	Reset any RCD's or overloads
Compressor running	Check for leaks, check diffusers, check for blockages in air pipe

### Poor Air Distribution

Problem	Correction
Compressor failure	Check power to compressor and replace or repair if necessary
Broken Blower	Replace or Repair blower
Tripped	Reset any RCD's or overloads
Compressor running	Check for leaks, check diffusers, check for blockages in air pipe
Diffuser	Check diffuser performance and replace if necessary

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## Treatment plant smelling

Problem	Correction
From Plant	Check no grease or any other substance has entered the unit
Broken Blower	Replace or repair blower
Sludge zone full	De-sludge the unit. If the unit is not de-sludged the sludge can turn septic causing a foul smell. Excessive accumulation of sludge will also cause smells and will carry over into the treatment zone causing blockages in the media. (see below on de-sludging)
From Kiosk	Check all ducts are sealed to stop gasses entering the unit
From covers	Check all ducts and covers are sealed; expanding foam recommended

## De-scum/De-sludge process

Firstly, remove any floating scum layer in the primary and sludge compartments. Place the hose in the 1<sup>st</sup> compartment of the primary/sludge zone and remove sludge.

Place the hose in the 2<sup>nd</sup> compartment of the primary/sludge zone and remove sludge.

Remove any floating scum in the bio and final zones.

FlowPath Model	Population Equivalent	Primary/Sludge Zone Capacity M3	Saf Zone Capacity M3	Final Zone Capacity M3	Total Capacity M3
FlowPath-60	60	6.88	2.86	3	12.74
FlowPath-80	80	9.39	3.81	4.1	17.3
FlowPath-100	100	11.48	4.77	5.16	21.41
FlowPath-125	125	14.35	5.97	6.45	26.77
FlowPath-150	150	17.22	7.16	7.74	32.12

## Pumps and Blowers

Pumps and blowers are tailored to the needs of the process or by availability so individual maintenance and guidance for blowers will be given with installation guides.

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## **Start Up**

Before any effluent enters the treatment zone the blowers must be in operation. The plant will have some water in following installation and as soon as effluent enters the plant the biological process starts and the bacterial colony begins to establish, at first the effluent quality will be poor and may take up to 8 weeks to reach optimum quality, the process will be quicker in the summer/warmer months, it may be necessary to, any proprietary treatment must also be in operation, i.e. Grease Traps, Interceptors.

## **Within 24 hours**

- Check Side Channel Blower is running and not overheating
- Check Air pattern is even in Biozone and adjust if necessary
- Check return pumps are working correctly
- Check any proprietary treatment is working, i.e. Grease traps etc.

## **Service Agreements**

We Build It Ltd offer a tailor-made service agreement to ensure that your unit continues to run as efficiently as possible and that you meet with your legal requirements.

This includes servicing of the system, where maintenance checks will be carried out to keep the unit running at the highest possible standards. Emergency breakdown cover is also included in this agreement. Furthermore, the cost of all serviceable parts at the time of maintenance or call out are free of charge.

### **Benefits in our service agreements, and these are listed below.**

- 1 or 2 visits of Emergency breakdown cover for 12 months. If you have any problem with your unit, call us and we will come out and fix it free of charge.
- 2 service visits per year where all necessary checks are carried out. This includes checking the blower filters, check control panel and connections are sound, air vents and louvers into the kiosk are free from debris, assessing the aeration pattern, sludge levels and effluent quality.

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- All labour expenses for servicing and call outs are covered so there are no hidden costs.
- All serviceable parts are free of charge. This includes, replacing the control panel air filters and carbon filters replacements.
- Replacement parts are at a discounted.
- Ensuring floating sludge is no thicker than 150mm and the settled sludge is at least 1 meter below the top water level.
- Emptying is **NOT** included in the agreement.

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## General Notes

**Do not allow surface / rainwater to enter the system.** This will affect the process.

**Do not dispose of any surplus medicines, or dressings into the system.** Antibiotics will kill your unit these should be disposed of in the correct manner.

**Do not empty large amounts of detergents, chemical toilet liquid or bleach in to the system.** Only use the correct amount to clean sanitary wear; little and often will have no detrimental effect on the unit. For chemical toilet liquid on caravan sites, a separate holding tank must be used.

**Sanitary items, nappy liners, baby wipes, cotton wool, etc. will be contained within the primary settlement tank with no detrimental effect on the unit, but their use will increase the emptying period.**

**Do not empty cooking oil down the sink or into the system.** The oil will smother the friendly bacteria in your unit. For commercial kitchens a grease separator is required to remove oils, fats and grease.

**Do not allow a hot tub, spa or any other large volume of water to discharge into the system.** The volumes are too great and will flush untreated sewage through your unit. If chlorination is used, this will also KILL the bacteria.

**Do not install a waste disposal unit.** The unit would need to be three times the size to digest the additional organic waste produced, it is easier to compost this waste.

**Do Service your FlowPath twice a year.** It takes approximately 1-2 hours and will keep your tank functioning properly and achieve consent levels.

Should you have any questions regarding the operation or maintenance of the Flowpath sewage treatment system, please contact We Build It Ltd 24-hour helpline on 01746 781782, or take advantage of our servicing and maintenance contracts.

**Contact us for a quote at [sales@webuildit-ltd.co.uk](mailto:sales@webuildit-ltd.co.uk) or call 01746 781782**

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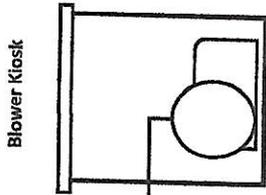
  
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# FlowPath-70 Saf Treatment Plant

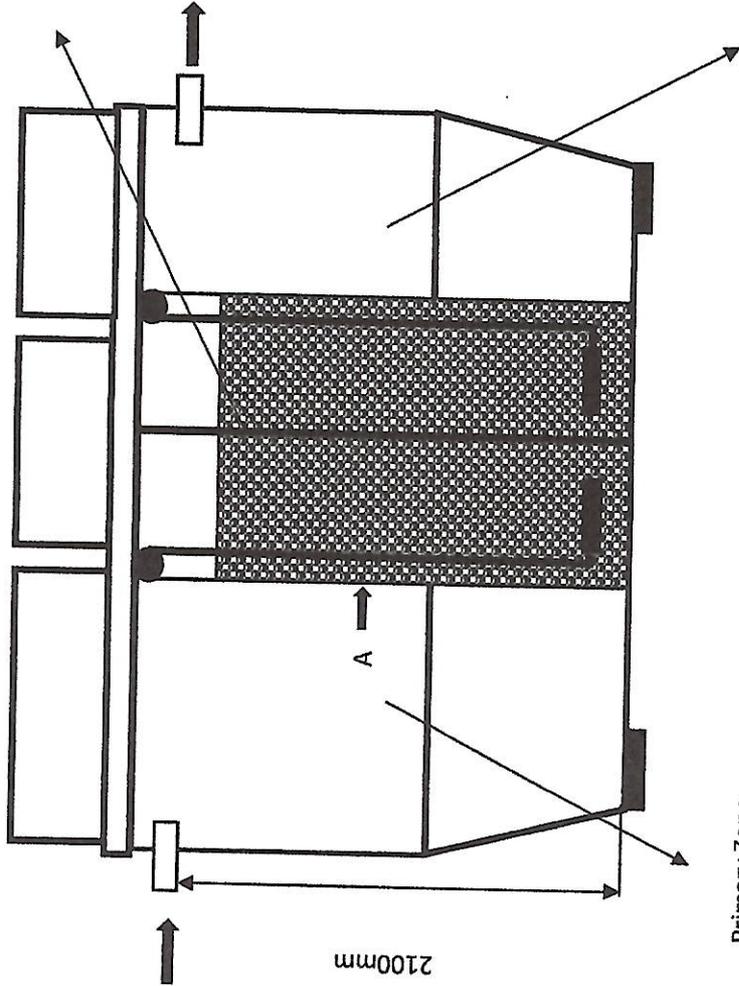
## The FlowPath

Simple solution sewage systems



View on arrow A

4 stage BioZone



**Tank Dimensions**  
 4400mm long  
 2710mm wide  
 3000mm high

Domestic sewage
Per capita flow: 150l/hd/day
Max flow: 3DWF
BOD load: 60g/hd/day
NH3 load: 8g/hd/day
Solids load: 60g/hd/day
Consent Standard: 30mg/l suspended solids and 20mg/l BOD (95%ile)

Population Equivalent: 70
DWF: 16m3/day
Max flow 3DWF: 1.5m3/hr
Crude BOD load: 4.8kg/day
Crude Solids load: 5.6kg/day
Crude NH3 load: 0.65kg/day
Sludge storage: 60days

Primary and sludge tank: 9.3
Primary settlement zone: 4.7m3
Sludge storage zone: 4.6m3
SAF media/tank volume: 3.8m3
Media specific surface area: 56m2/m3
Media voidage: 95%
No. of SAF compartments: 2 minimum
Final settlement volume: 4.8m3
Oxygen requirement: 7kgO2/day

GJC/FP70/FEB2014 Not To Scale

