SEWAGE SYSTEM DESIGN BRIEF
CAFRAMO LIMITED
501273 GREY ROAD 1
TOWNSHIP OF GEORGIAN BLUFFS

Prepared By:
GM BluePlan
Engineering Limited

For:
Caframo Limited

File No: 214154
September, 2014

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SEWAGE SYSTEM DESIGN BRIEF
CAFRAMO LIMITED
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1.0 INTRODUCTION

Mr. Dale Schnurr, Director of Plant Operations for Caframo Limited, contacted Ian Eriksen, P.Eng., and requested that GM BluePlan Engineering Limited (GM BluePlan) provide engineering services relating to a new sewage system to service the Caframo Limited commercial business.

The Caframo Limited property is located at 501273 Grey Road 1 in the Township of Georgian Bluffs. For the purposes of this report, Grey Road 1 is assumed to travel in an east-west direction and is located to the south of the subject property. The property is also bound by residential lands to the east and west, and Colpoys Bay to the north.

There are several existing buildings on the property. The main building which consists of the main offices and production areas is located in the northeast corner of the property. A storage area and testing facility is located in a building in the south-central portion of the property and a warehouse building is located on the west side of the property.

An existing sewage system exists to the north of the office/manufacturing building. However, it appears undersized and should be replaced.

The following design brief has been prepared in support of an application for a new on-site sewage system to service the Caframo Limited site operations.

2.0 SOILS INVESTIGATION

As part of the site development, a topographical survey was conducted by Ivan Dinsmore Ltd., most recently updated on September 28, 2010 to determine the existing features and establish the proposed grades and setbacks for the sewage system. Furthermore, a number of testholes were excavated by GM BluePlan staff on June 11, 2014 on the east side of the site to evaluate the sub-surface conditions in that area.

As shown on the plan, Testhole No. 1 to 6 are located in the general area of the proposed sewage system, just north of the warehouse building. TH-1 was located in an area which was previously backfilled with 0.55 m of granular material, underlain by native brown clay with silt and boulders. TH-2 to TH-6 were very similar, with 0.15 m to 0.30 m of topsoil over 1.7 to 1.85 m of firm, brown clay with silt and boulders. A particles size analysis was completed on a sample of the native soils. The soils were defined as sandy gravel with some silt and clay. A 't' time of 40 to 50 min/cm was established for the native soils. A copy of the particle size analysis and testhole logs is attached.

TH-7 was located in a potential area for a sewage system on the south side of the warehouse building. TH-7 consisted of 0.80m of granular backfill with concrete and boulders, over the native firm, grey clay and till.

No groundwater was encountered in any of the testholes.

3.0 SEWAGE SYSTEM DESIGN

3.1 ONTARIO BUILDING CODE REQUIREMENTS

The Ontario Building Code 2012 (OBC) incorporates guidelines for the design of private sewage systems based upon sewage volumes, soil types and location of the water table. The OBC has also incorporated guidelines for siting various components. The following design is based on the guidelines.

3.2 SEWAGE VOLUMES

Based on discussions with Mr. Schnurr regarding the operations at Caframo, it appears that employees essentially work in the manufacturing area or in an office area. There are 5 bathrooms without showers in the main office/manufacturing building. While there is also a storage/testing building and a warehouse building, both of which are expected to have a washroom in the near future, in this case, the undersigned feels calculating the sewage flows based on the number of employees provides the most equitable estimation of sewage flows.

The OBC provides typical daily design sanitary sewage flows for various occupancies and establishments. Using the above information, it appears that all employees would fall into one of the two following categories.

Factory – per employee per 8 hour shift – no showers ..... 75 L/d
Office Building – per employee per 8 hour shift..... 75 L/d

Currently there are 70 to 80 employees at Caframo working in 2 shifts. It is expected that Caframo will be expanding in the near future and Mr. Schnurr expects the maximum number of employees that the existing plant may require to be 125 employees. As such, the design flows for the proposed sewage system are calculated as follows:

125 employees * 75 L/day/employee = 9,375 L/day.

As such, the total estimated design of sewage flow is expected to be 9,375 L/day.

Mr. Schnurr also noted, and provided documentation, that the monthly water usage at the plant is 35,000 L per month, which works out to an average of less than 2,000 L/day for 70 to 80 employees. As such, the design sewage flow is considered conservative.

It should be noted that since the design is based on the number of employees, the future bathrooms in the storage/testing building and warehouse building are considered to be included.

3.3 COLLECTION SYSTEM

Under existing conditions, the only washrooms on the Caframo property are located in the main office building. The existing sanitary sewer outlet drains out the north out of the building to a 5000 Litre septic tank, with the existing bed located to the north of the septic tank. It is proposed to leave the existing septic tank and to install a pump chamber just north of the tank. However, the existing septic tank is not necessary to the system design.

The pump chamber would include duplex pumps capable of handling solids, with isolation valves and controls based on liquid level in the chamber wet well. Pumps shall be submersible grinder pumps capable of handling soft solids with high-grade impellers to minimize pump clogging. The poump chamber is to be equipped with automatic alternating duplex pumps controlled by liquid level float switches. Each chamber shall be equipped with floats to start and stop pumps, a low-level cut-out for both pumps, and a high level alarm. An electrical box shall be installed locally beside each pumping station with power supply, relays and control circuitry in weather-proof enclosures mounted on posts.

A 50 mm forcemain conveys sewage from the pump chamber to a 1200 mm dia. sanitary manhole (SAN MH-2 proposed to the north of the Warehouse building.

To accommodate the potential future washrooms in the Testing Facility/Storage Building and the Warehouse Building a 1200 mm dia. sanitary manhole (SAN MH-1) is proposed to be installed just north of the Testing Facility/Storage Building. SAN MH-1 drains by gravity to SAN MH-2.

3.4 TREATMENT UNIT

Due to the limited space between the Warehouse building and the Grey Sauble Conservation Authority's Regulated Area, a treatment system is being proposed to treat the sewage to levels meeting the Level IV effluent requirements of the OBC 2012.

The MicroFAST 3.0 treatment unit manufactured by Bio-Microbics Inc. is approved as a level IV treatment unit in OBC 2012 and has a maximum treatment capacity of **11,356 litres/day**. Sewage from SAN MH-2 drains by gravity to the FAST treatment system which consists of a two-chamber concrete or fibreglass tank with the first chamber being a settling chamber and the second tank including the FAST insert module. A remote, above ground blower introduces air into the aeration zone of the treatment module providing circulation of wastewater. A self-regulating population of bacteria metabolize the incoming waste.

Effluent from the second chamber is discharged by gravity to a 9,100 L dosing chamber complete with duplex pumps, level switches, alarms and control panel as outlined in more detail in Section 3.3. A GAG Sim/Tech 100 micron pressure filter is to be installed on the outlet of the pumps. The pumps will alternate pumping to one of two 50 mm forcemains, each of which discharges to a distribution box which doses effluent to half of the dispersal bed.

The system must be installed with appropriate duplex controls and alarms as designated by the owner.

3.5 TYPE A DISPERSAL BED

The Type A dispersal bed is to be located to the south-west of the Warehouse building as shown on the attached Site Plan. The dispersal bed is to be fully raised above the native soils. The existing fill and topsoil must be stripped from the filter bed area and the native soils levelled and pre-graded. With the Level IV treatment capabilities of the MicroFAST unit, the filter beds have been designed as a Type A dispersal bed in accordance with OBC 2012.

As per the OBC 2012, a Type A dispersal bed consists of a minimum 200 mm thick layer of stone, underlain by a minimum 300 mm deep layer of sand. The sand must have a percolation time between 6 and 10 min/cm with not more than 5% of fines passing through a 0.074 mm (No. 200) sieve.

The minimum size of the stone layer is:

$$A = \frac{Q}{B} = \frac{9{,}375 \text{ litres/day}}{50} = 188 \text{ m}^2$$

The minimum size of the sand layer is:

$$A = \frac{QT}{850} = \frac{9{,}375 \text{ litres/day} * 50 \text{ min/cm}}{850} = 552 \text{ m}^2$$

Since the underlying soils have a percolation time of greater than 15 min, the OBC also states that the contact area between the sand and the native soil must not be less than the area, Ac, as calculated below:

$$A_c = \frac{QT}{400}$$

Based on a sample of the native sand collected from TH-1, a percolation time was estimated to be 40 to 50 minutes/cm. As such, the expanded contact area is:

$$A_c = \frac{9{,}375 \text{ litres/day} \times 50 \text{ min/cm}}{400} = 1172 \text{ m}^2$$

As such, the stone layer is proposed to be 6 m x 32 m for 192 m^2 and the sand layer is proposed to cover a 1200 m^2 area. The dispersal bed is to be constructed in conformance to meet the OBC.

Attached and forming part of this design brief is a copy of the testhole logs, the particle size analysis for the native soils, product information for the MicroFAST treatment unit and Engineering Drawings including a Site Plan, Sewage System Details Plan, and Notes and Details Plan showing the general location of the main components of the sewage system, cross-section of the dispersal bed and details of the pump chambers and treatment system.

The contractor and licenced installer are responsible to co-ordinate the final sizing and installation details of the treatment unit in conjunction with installation requirements provided by Bio-Microbics Inc. The electrical and mechanical requirements must also be co-ordinated and be included with the installation.

All of which is respectfully submitted.

GM BluePlan Engineering Limited
Per:

Ian E. Eriksen, P.Eng.
IEE/ie

LICENSED PROFESSIONAL ENGINEER
I. E. ERIKSEN
100128824
Sept. 25/14
PROVINCE OF ONTARIO

cc: File No.: 214154

ATTACHMENTS

Testhole Logs
Grain-Size Distribution Native Sand
Product Information for MicroFAST Treatment Unit
Engineering Drawings

TESTHOLE ID: 1

BluePlan ENGINEERING

CLIENT	Caframo Limited	**PROJECT NAME**	Caframo Sewage System
PROJECT NUMBER	214154	**PROJECT LOCATION**	Georgian Bluffs
DATE COMPLETED	June 11, 2014	**CONTRACTOR**	Jones Contracting
LOGGED BY	JW	**METHOD**	Excavator
DEPTH TO GROUNDWATER	▼ No groundwater observed	**NOTES**	

DEPTH (m)	DEPTH (ft)	ELEVATION	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	SOIL PROPERTIES (Moisture % 20 40 60 80)
		179.0			0.00 Granular FILL 179.10	
	0.5					
	1.0					
	1.5					
0.5					0.55 178.55	
	2.0	178.5			Firm, brown CLAY with silt and boulders	
	2.5					
	3.0					
1.0						
	3.5	178.0				
	4.0					
	4.5					
1.5	5.0					
		177.5				
	5.5					
	6.0					
2.0	6.5					

Testhole Terminated at 2.00 m.

TESTHOLE ID: 2

BluePlan ENGINEERING

CLIENT	Caframo Limited	**PROJECT NAME**	Caframo Sewage System
PROJECT NUMBER	214154	**PROJECT LOCATION**	Georgian Bluffs
DATE COMPLETED	June 11, 2014	**CONTRACTOR**	Jones Contracting
LOGGED BY	JW	**METHOD**	Excavator
DEPTH TO GROUNDWATER	▼ No groundwater observed	**NOTES**	

DEPTH (m / ft)	ELEVATION	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	SOIL PROPERTIES (Moisture % 20 40 60 80)
0.00				TOPSOIL — 178.90	
0.30				Firm, brown CLAY with silt and boulders — 178.60	

Depth scale: m: 0.5, 1.0, 1.5, 2.0; ft: 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0, 6.5

Elevation: 178.5, 178.0, 177.5, 177.0

Testhole Terminated at 2.00 m.

TESTHOLE ID: 3

BluePlan ENGINEERING

CLIENT	Caframo Limited	**PROJECT NAME**	Caframo Sewage System
PROJECT NUMBER	214154	**PROJECT LOCATION**	Georgian Bluffs
DATE COMPLETED	June 11, 2014	**CONTRACTOR**	Jones Contracting
LOGGED BY	JW	**METHOD**	Excavator
DEPTH TO GROUNDWATER	▼ No groundwater observed	**NOTES**	

DEPTH (m)	DEPTH (ft)	ELEVATION	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION		SOIL PROPERTIES (Moisture % 20 40 60 80)
					0.00 TOPSOIL	178.80	
	0.5				0.15	178.65	
					Firm, brown CLAY with silt and boulders		
	1.0	178.5					
	1.5						
0.5							
	2.0						
	2.5	178.0					
	3.0						
1.0							
	3.5						
	4.0	177.5					
	4.5						
1.5	5.0						
	5.5						
	6.0	177.0					
2.0	6.5						

Testhole Terminated at 2.00 m.

TESTHOLE ID: 4

BluePlan ENGINEERING

CLIENT	Caframo Limited	**PROJECT NAME**	Caframo Sewage System
PROJECT NUMBER	214154	**PROJECT LOCATION**	Georgian Bluffs
DATE COMPLETED	June 11, 2014	**CONTRACTOR**	Jones Contracting
LOGGED BY	JW	**METHOD**	Excavator
DEPTH TO GROUNDWATER	▼ No groundwater observed	**NOTES**	

DEPTH (m)	DEPTH (ft)	ELEVATION	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	SOIL PROPERTIES (Moisture % 20 40 60 80)
		178.5			0.00 TOPSOIL 178.61	
	0.5					
	1.0				0.30 178.31	
					Firm, brown CLAY with silt and boulders	
	1.5					
0.5						
	2.0	178.0				
	2.5					
	3.0					
1.0						
	3.5	177.5				
	4.0					
	4.5					
1.5	5.0					
		177.0				
	5.5					
	6.0					
2.0	6.5					

Testhole Terminated at 2.00 m.

TESTHOLE ID: 5

BluePlan ENGINEERING

CLIENT	Caframo Limited	**PROJECT NAME**	Caframo Sewage System
PROJECT NUMBER	214154	**PROJECT LOCATION**	Georgian Bluffs
DATE COMPLETED	June 11, 2014	**CONTRACTOR**	Jones Contracting
LOGGED BY	JW	**METHOD**	Excavator
DEPTH TO GROUNDWATER	▼ No groundwater observed	**NOTES**	

DEPTH (m)	DEPTH (ft)	ELEVATION	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION	SOIL PROPERTIES (Moisture % 20 40 60 80)
					0.00 TOPSOIL 178.15	
	0.5	178.0				
	1.0				0.30 177.85	
					Firm, brown CLAY with silt and boulders	
	1.5					
0.5						
	2.0	177.5				
	2.5					
	3.0					
1.0						
	3.5	177.0				
	4.0					
	4.5					
1.5	5.0					
	5.5	176.5				
	6.0					
2.0	6.5					

Testhole Terminated at 2.00 m.

TESTHOLE ID: 6

BluePlan ENGINEERING

CLIENT	Caframo Limited	**PROJECT NAME**	Caframo Sewage System
PROJECT NUMBER	214154	**PROJECT LOCATION**	Georgian Bluffs
DATE COMPLETED	June 11, 2014	**CONTRACTOR**	Jones Contracting
LOGGED BY	JW	**METHOD**	Excavator
DEPTH TO GROUNDWATER	▼ No groundwater observed	**NOTES**	

DEPTH (m)	DEPTH (ft)	ELEVATION	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION		SOIL PROPERTIES (Moisture % 20 40 60 80)
					0.00 TOPSOIL	178.20	
	0.5	178.0					
	1.0				0.30	177.90	
					Firm, brown CLAY with silt and boulders		
	1.5						
0.5							
	2.0						
		177.5					
	2.5						
	3.0						
1.0							
	3.5						
	4.0	177.0					
	4.5						
1.5							
	5.0						
	5.5	176.5					
	6.0						
2.0	6.5						

Testhole Terminated at 2.00 m.

BluePlan ENGINEERING

TESTHOLE ID: 7

CLIENT Caframo Limited
PROJECT NUMBER 214154
DATE COMPLETED June 11, 2014
LOGGED BY JW
DEPTH TO GROUNDWATER No groundwater observed
PROJECT NAME Caframo Sewage System
PROJECT LOCATION Georgian Bluffs
CONTRACTOR Jones Contracting
METHOD Excavator
NOTES

DEPTH (m / ft)	ELEVATION	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION		SOIL PROPERTIES (Moisture % 20 40 60 80)
	180.5			0.00 Granular FILL with concrete and boulders	180.60	
0.5	180.0					
1.0	179.5			0.80 Firm, grey clay and TILL	179.80	
1.5	179.0					

Testhole Terminated at 1.60 m.

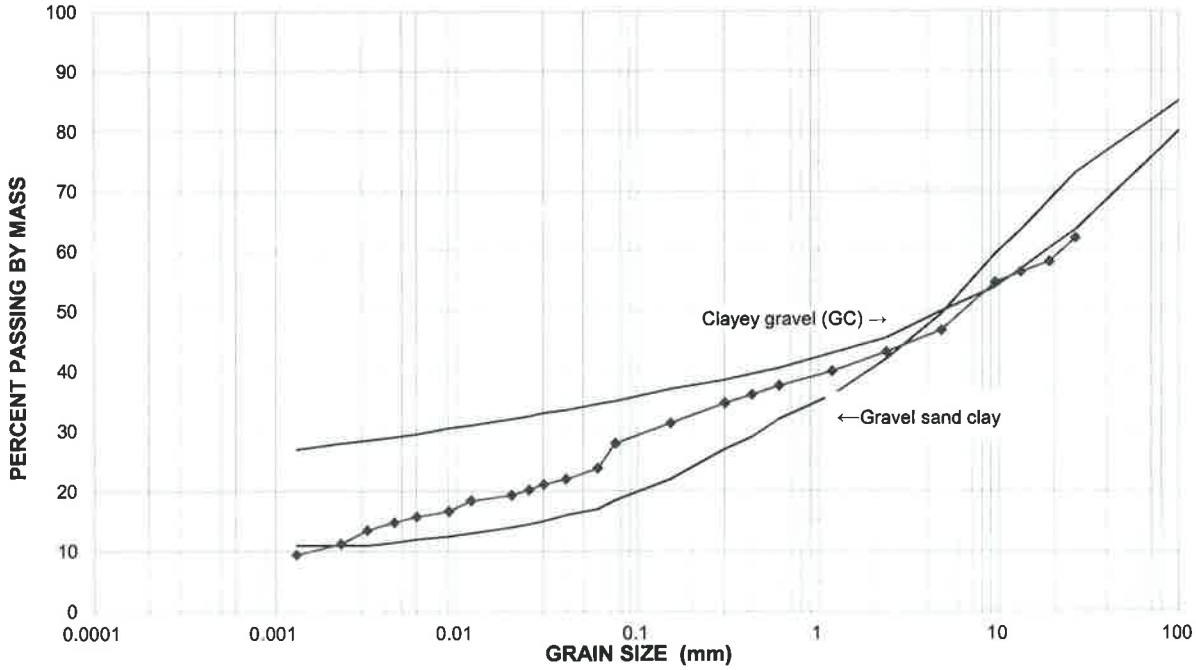
Gamsby and Mannerow
E N G I N E E R S

Gamsby and Mannerow Limited
people engineering environments
Guelph, Owen Sound, Listowel, Kitchener, Exeter
1260 2nd Ave E., Unit 1 Owen Sound, ON N4K 2J3
519-376-1805 Fax 519-376-8977 www.gamsby.com

PARTICLE SIZE ANALYSIS

PROJECT:	Caframo Sewage System	FILE NO.:	214154
LOCATION:	501273 Grey Road 1, Mun. of Georgian Bluffs	LAB SAMPLE NO.:	S1555
CLIENT :	Caframo Limited	SAMPLE DATE:	June 11, 2014
SOIL TYPE:	Sandy Gravel, some Silt and Clay	SAMPLED BY:	R. Givens
GRAPH # :	4 - Clayey Gravels, Gravel Sand Clay Mixtures (GC)	SOURCE:	TH-1 @ 1.5m

PARTICLE SIZE DISTRIBUTION



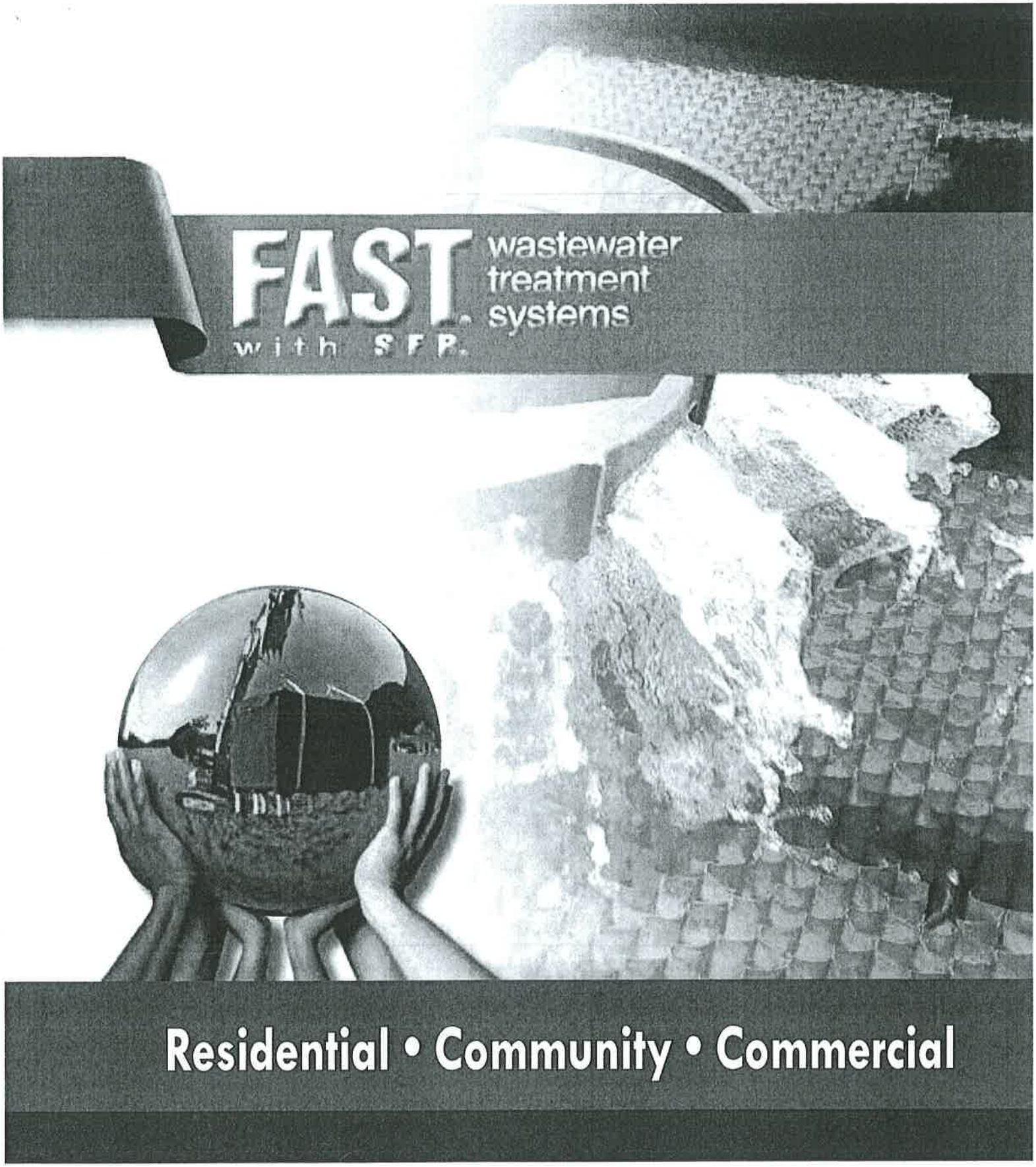
←		FINE	MEDIUM	COARSE	FINE	COARSE
CLAY	SILT	SAND			GRAVEL	

SIEVE SIZE PARTICLE DIA. (mm)	PERCENT PASSING SAMPLE	HYDROMETER PARTICLE DIA. (mm)	PERCENT PASSING SAMPLE
26.5	62.2	0.0600	23.8
19	58.2	0.0400	22.0
13.2	56.5	0.0300	21.1
9.5	54.8	0.0250	20.2
4.75	46.8	0.0200	19.3
2.36	43.2	0.0120	18.4
1.180	40.0	0.0090	16.6
0.600	37.6	0.0060	15.7
0.425	36.1	0.0045	14.8
0.300	34.6	0.0032	13.5
0.150	31.3	0.0023	11.2
0.075	27.9	0.0013	9.5

D_{10} : 0.0016 mm **D_{60} :** 22.4 mm **Cu :** 14000

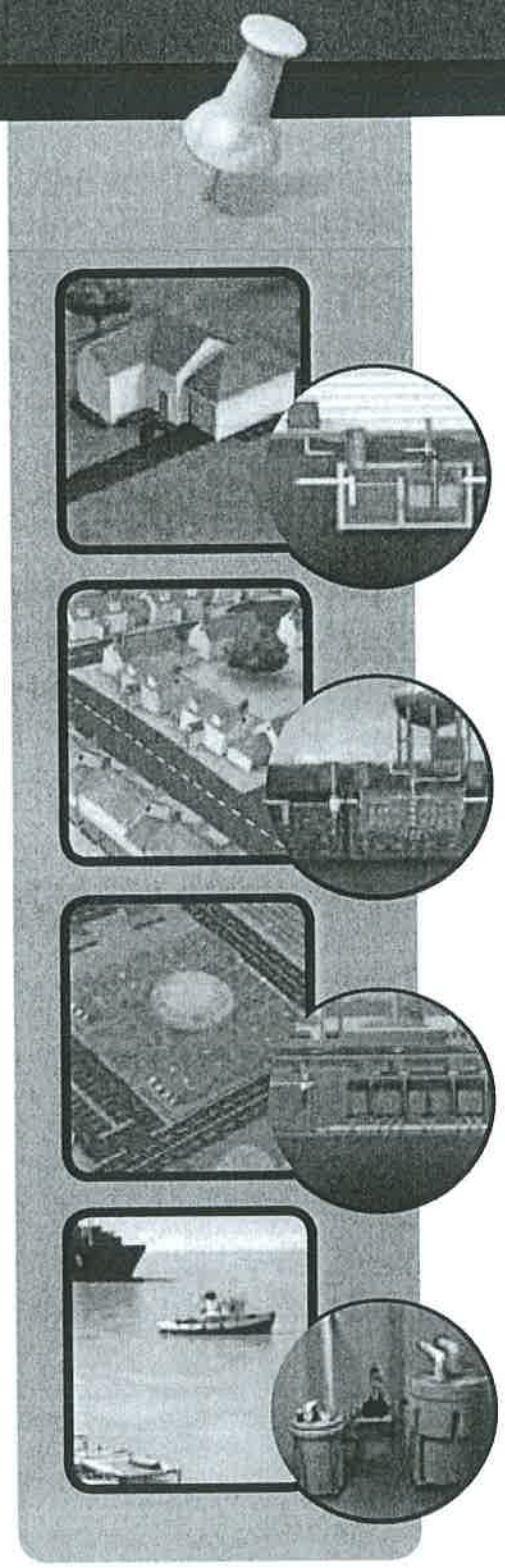
Coefficient of Permeability: 2.56×10^{-6} cm/sec **"T" Time :** 40-50 mins/cm

Comments:



BIO MICROBICS

BETTER WATER. BETTER WORLD.



Single-Family & Residential Systems

RetroFAST® & MicroFAST®: Unobtrusive and dependable, the FAST® system causes no harm to the environment. Ideal for new construction and remediation, most residential systems are shipped completely assembled and ready to install. The clean effluent prevents biomat formation and leachfield clogging. Septic technology is very compatible with shallow drip, direct discharge, pressure distribution, spray irrigation, and conventional leachfield.

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MicroFAST®, HighStrengthFAST® & MyFAST®: Offering versatility and consistent high performance for commercial properties with kitchens and cafeterias, the FAST® larger commercial systems produces high-quality effluent specifically designed for water reuse applications.

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Innovative Ideas, Proven Products

- Exceptional microbial growth during low/average/peak usage
- Increases sludge settleabilty and eliminates sludge bulking
- Easy to maintain and extraordinarily reliable
- Exceeds minimum Nitrogen Reduction Standards
- Lessen the impact of harmful bacteria and viruses
- Takes all aspects of the treatment into consideration

RESIDENTIAL

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A simple upgrade to deliver high levels of treatment to enhance/renovate a septic system; see our S.O.S.-Save Our Septic® Warranty Program.

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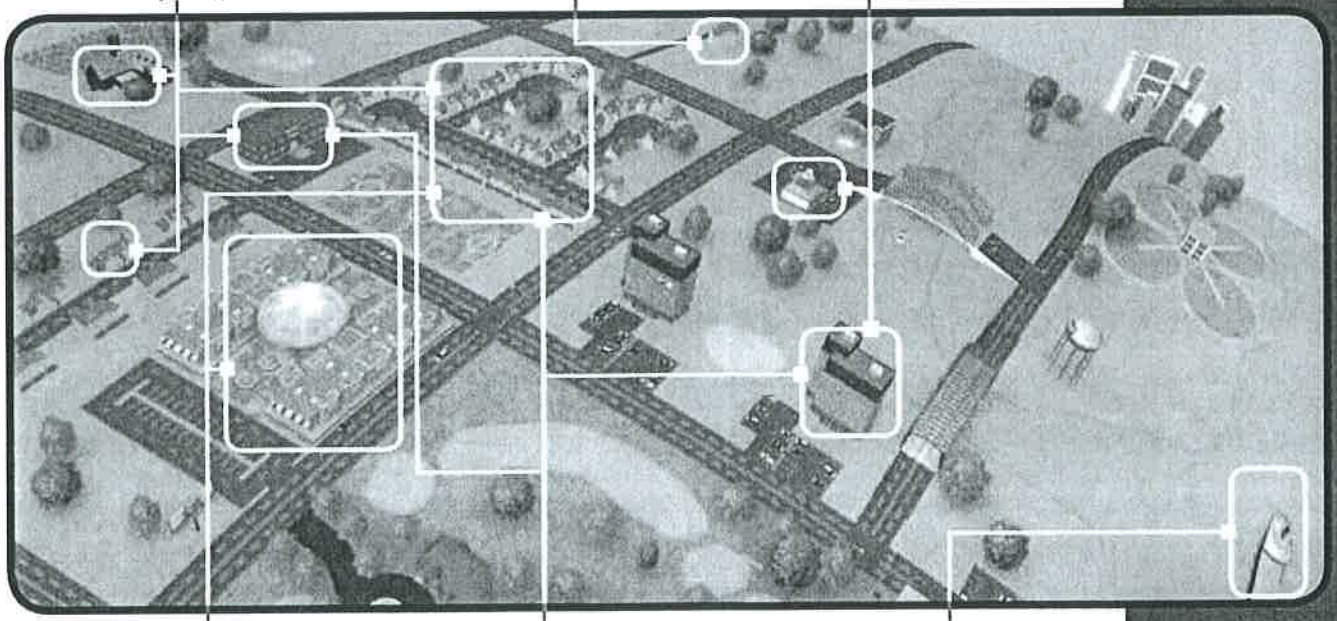
Meeting the unique challenges of high-strength commercial applications or properties with a higher loading with robust, low-maintenance treatment systems.



MyFAST wastewater treatment systems

Ideal for small communities or commercial properties, the MyFAST® maintains consistent high performance, low maintenance, and sludge management all in one tank.

NitriFAST

For use with a MicroFAST® system to provide second stage nitrification to achieve even higher levels of nitrogen reduction.

MarineFAST

Certified Type II Marine Sanitation Devices (MSDs) for virtually every type of vessel or offshore structure.

GENERAL FAST® PRODUCT INFORMATION

RetroFAST	Maximum Treatment Capacity*		Module Dimensions*** (L x W x H) [-16" (45.7cm) dia. opening required]	Weight***	
	Volume/Module**	People per Module**		Pounds	Metric
RetroFAST® 0.150	150 GPD (567 LPD)	1 to 3	22" (55 cm) x 24" (61 cm) x 32" (81 cm)	74 lbs	34 kg
RetroFAST® 0.250	250 GPD (947 LPD)	1 to 4	27" (67 cm) x 30" (76 cm) x 34" (85 cm)	125 lbs	57 kg
RetroFAST® 0.375	375 GPD (1420 LPD)	1 to 5	39" (98 cm) x 30" (76 cm) x 34" (85 cm)	156 lbs	71 kg

MicroFAST	Maximum Treatment Capacity*		Module Dimensions*** (L x W x H)	Weight***	
	Volume/Module**	People per Module**		Pounds	Metric
MicroFAST® 0.5	500 GPD (1893 LPD)	1 to 8	59" (150 cm) x 30" (76 cm) x 56" (130 cm)	165 lbs	75 kg
MicroFAST® 0.625	625 GPD (2366 LPD)	1 to 10	60" (152 cm) x 43" (109 cm) x 55" (130 cm)	185 lbs	84 kg
MicroFAST® 0.75	750 GPD (2839 LPD)	1 to 11	60" (152 cm) x 43" (109 cm) x 55" (130 cm)	200 lbs	91 kg
MicroFAST® 0.9	900 GPD (3407 LPD)	1 to 14	59" (150 cm) x 48" (122 cm) x 57" (145 cm)	215 lbs	98 kg
MicroFAST® 1.5	1500 GPD (5678 LPD)	6 to 21	82" (208 cm) x 55" (140 cm) x 58" (147 cm)	456 lbs	207 kg
MicroFAST® 3.0	3000 GPD (11356 LPD)	10 to 42	71" (180 cm) x 59" (150 cm) x 81" (206 cm)	725 lbs	329 kg
MicroFAST® 4.5	4500 GPD (17034 LPD)	18 to 63	145" (368 cm) x 73" (185 cm) x 51" (130 cm)	1600 lbs	726 kg
MicroFAST® 9.0	9000 GPD (34068 LPD)	30 to 126	145" (368 cm) x 73" (185 cm) x 76" (193 cm)	2300 lbs	1044 kg

Larger Applications>9000 GPD *Multiple FAST® treatment modules can be used in parallel and/or series for additional flow or desired treatment levels.*

HighStrengthFAST	Maximum Treatment Capacity*		Module Dimensions*** (L x W x H)	Weight***	
	Volume/Module**	People per Module**		Pounds	Metric
HighStrengthFAST® 1.0	~900 GPD (3407 LPD)	Consult Factory	59" (150 cm) x 48" (135 cm) x 57" (130 cm)	227 lbs	103 kg
HighStrengthFAST® 1.5	~1500 GPD (5678 LPD)		82" (208 cm) x 55" (140 cm) x 58" (147 cm)	456 lbs	207 kg
HighStrengthFAST® 3.0	~3000 GPD (11356 LPD)		71" (180 cm) x 59" (150 cm) x 81" (206 cm)	725 lbs	329 kg
HighStrengthFAST® 4.5	~4500 GPD (17034 LPD)		145" (368 cm) x 73" (185 cm) x 51" (130 cm)	1600 lbs	726 kg
HighStrengthFAST® 9.0	~9000 GPD (34068 LPD)		145" (368 cm) x 73" (185 cm) x 76" (193 cm)	2300 lbs	1044 kg

Larger Applications>9000 GPD *Multiple FAST® treatment modules can be used in parallel and/or series for additional flow or desired treatment levels.*

MyFAST	Maximum Treatment Capacity*		AMS ZONE *Optional Lixor® system*	BMS ZONE *Optional Package*	OPTIONAL MyTEE® SCREENING DEVICE	
	Volume	People Served			Minimum Tank Volume	Units
MyFAST® 2.0	20000 GPD (75.7 m³/d)	up to 400+	4.0XD	Lixor® 2.0	5000 gallon [19 m³]	2
MyFAST® 4.0	40000 GPD (150 m³/d)	up to 600+	4.0XD	Lixor® 2.0	5000 gallon [19 m³]	2
MyFAST® 6.0	60000 GPD (225 m³/d)	up to 900+	6.0XD	Lixor® 3.0	7500 gallon [28 m³]	3
MyFAST® 8.0	180000 GPD (300 m³/d)	up to 1200+	(2) 4.0XD	Lixor® 4.0	10000 gallon [38 m³]	4
MyFAST® 12.0*	120000 GPD (450 m³/d)	up to 1900+	(2) 6.0XD	Lixor® 6.0	(2) 7500 gallon [28 m³]	6
MyFAST® 16.0*	160000 GPD (600 m³/d)	up to 2500+	(4) 4.0XD	Lixor® 8.0	(2) 10000 gallon [38 m³]	8

Larger Applications >160000 GPD, consult factory. *Multiple FAST® treatment modules can be used in parallel and/or series for additional flow or desired treatment levels.*

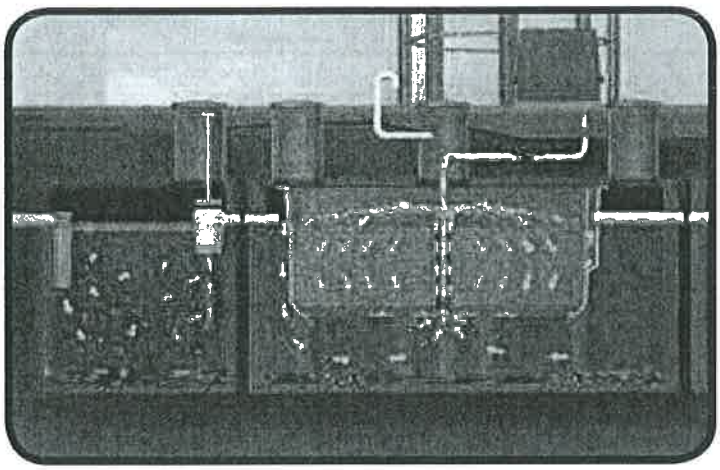
*Treatment capacity: Individual FAST® module capacities are rated based on biological (BOD), hydraulic and other project-specific considerations. All rated capacities are given as guidelines for suggested use. Actual capacity may vary with local conditions and performance goals.

**Volume/People per module: Please note that only residential applications or those applications requiring treatment for only sanitary wastewater may be designed from the volume and number of people per module. Actual capacity may vary with local conditions and performance goals.

***Module dimensions/weight provided only for shipping specifications. Please see design specifications for recommended exterior tankage sizing. Treatment modules shall be installed inside tanks that are locally approved and manufactured using watertight materials.

Electrical Options: Electrical components are available to meet all worldwide electrical specifications (volt/phase/frequency).

FAST Wastewater Treatment Systems



How Does the FAST® System Work?

1. Wastewater enters the treatment system
2. Natural separation and settling processes occur in the primary settling zone.
3. In the primary settling zone for most large residential and commercial applications, a SaniTEE® device is used to prevent large solids from entering the treatment zone.
4. A remote, above-ground blower introduces air (oxygen) into the treatment module to facilitate a robust circulation of wastewater through the media's channeled flow path.
5. Bacteria in the aeration zone become "fixed" or attached to the stationary media. This is where the abundant, diverse, self-regulating population of microbes consistently metabolize the incoming waste.
6. Clear, odorless, treated water is ready for standard or innovative dispersal.

Other Systems and Products available to suit your particular needs:

FAST® Wastewater Treatment Systems
- **NitriFAST**

Horizontal Trickling Filter Technology
- **SeptiTech® STAAR™ Residential**
- **SeptiTech® STAAR™ Commercial**

Membrane BioReactors (MBRs)
- **BioBarrier® MBR**
- **BioBarrier® HSMBR®**

Stormwater Treatment Solutions
- **BioSTORM® System**
- **StormTEE® Litter Control**

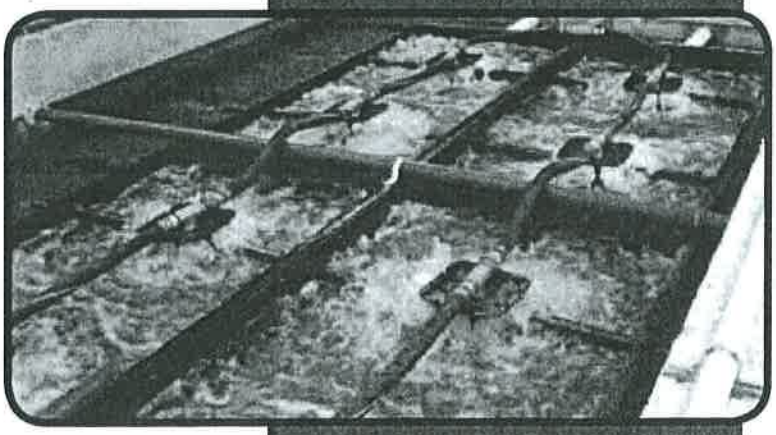
Marine Sanitation Technology
- **MarineFAST® LX-Series**
- **MarineFAST® M-&MX-Series**
- **MarineFAST® DV-Series**

Influent/Effluent Screening Solutions
- **BioSTEP®** Screened Pumping Systems
- **MyTEE® Grit Control Screen**
- **SaniTEE® Wastewater Screen**

Other Management Solutions
- **Lixor®** Submerged Aeration Systems
- **FOGHog® Traps & Tablets**
- **ABC®-N Clarifiers & Devices**

Water Treatment Solutions
- **SciCHLOR®** Hypochlorite Generators
- **SciBRINE® BrineMakers**
- **Mighty Mike® CPT Tablets**

Environmentally-Friendly Cleaning Solutions
- **Mighty Mike® All Purpose Cleaner**
- **Mighty Mike® Laundry Detergent**
- **Mighty Mike®** Marine Multi-Purpose Cleaner
- **Mighty Mike® Marine Liquid Descaler**
- **Mighty Mike® Industrial Descaler**



With over 45,000 installations in more than 60 countries, our Fixed Integrated Treatment Technologies (FITT®) are the result of decades of experience, research & development, and real world operating history.

- **2012 President's "E" Award** for Excellence in Exports, granted by the President of the United States, presented by the U.S. Department of Commerce
- **2011 Technology Innovation Award** (Decentralized Commercial Outlets) – Frost & Sullivan – FAST® Technology
- **2011 New Product of the Year Award** – Recycling Category. Environmental Protection Magazine (EPonline.com) "The financial, environmental and social benefits of 'recycling' are indisputable." – BioBarrier® MBR Technology
- **2011 Kansas Governor's Exporter of the Year** – presented by the Governor of KS, KS Dept. of Commerce
- **2010 North American Technology Innovation Award** (Water/Wastewater) – Frost & Sullivan – FAST® Technology
- **2009 Technology Merit Business Achievement Award**, Water/Wastewater – Environmental Business Journal (EBJ) – BioBarrier® MBR Technology
- **2002 U.S. Export Achievement Certificate**, US Dept. of Commerce, US & Foreign Commercial Service
- **2000 U.S. EPA Environmental Technology Innovator Award** – U.S. EPA, Region 1 – SeptiTech® Technology
- Australian Dept of Transportation & Royal Australian Navy - Technology Approval
- Canadian Great Lakes (CGL) Maritime Certification – Canadian Coast Guard
- Canadian Standards Association (CSA) International Electrical Certification
- CE – European Electrical Systems (including a "Tropical Certification Rating")
- China Classification Society (CCS) 中国船级社 – FAST® Technology Approval
- EN 12566-3, Packaged and/or site assembled domestic wastewater treatment plants for up to 50 People, PIA GmbH tested - BioBarrier® MBR 0.5, 1.0, & 1.5
- GreenSpec® (BuildingGreen.com Product Directory) listed. Provides accurate, unbiased, ...information [to]...improve the environmental performance, and reduce the adverse impacts of buildings
- IAPMO (International Association of Plumbing & Mechanical Officials) Listed – Fat Oil & Grease Interceptors/Traps R&T File #2586 – FOGHog® FH-20 & FH-50
- IMO (International Maritime Organization) MARPOL Annex IV (2010) – provides guidance for the Navigation and Vessel Inspection Circular (NVIC) No. 1-09, US EPA and other effluent standards as may be required – FAST® Technology
- Massachusetts Title 5 Innovative/Alternative System - Technologies Listed under "General Use Permit for Nitrogen Reduction", "Provisional Use," & "Remedial Use"
- NSF/ANSI Std 40, class I Certified – MicroFAST®, BioBarrier® MBR and SeptiTech® Systems up to 1500 GPD – Recognized in domestic and international trade by regulatory agencies at the local, state/province, and federal levels
- NSF/ANSI Std 245 (Nitrogen Reduction) Certified – MicroFAST®, BioBarrier®-N MBR, BioBarrier® MBR and SeptiTech® Systems up to 1500 GPD
- NSF/ANSI Std 350 class R (Water Reuse) Certified – BioBarrier® MBR 0.5, 1.0, & 1.5
- PDI (Plumbing & Drainage Institute) Certified – Standard PDI-WH201 and PDI-G101 grease interceptors – promotes the advancement of innovative plumbing products.
- Poland – Aprobata Techniczna (Technology Approval) ze Instytut Ochrony Srodowiska (Institute of Environmental Protection)
- România – Avizează Favorabil – Consiliul Tehnic Permanent Pentru Construcții – Ministerul Dezvoltarii Regionale Si Turismului
- Russia – Technology Approval – Федеральная Служба По Надзору В Сфере Защиты Прав Потребителей И Благополучия Человка (Federal Service of Environmental Protection)
- Russia – СРТ Свидетельство о Российских Стандартах (Certification of Russian Standards) – BioSTORM® – All sizes
- Russia – РМРС (Russian Maritime Register of Shipping) МЕЖДУНАРОДНОЕ СВИДЕТЕЛЬСТВО О ПРЕДОТВРАЩЕНИИ ЗАГРЯЗНЕНИЯ СТОЧНЫМИ ВОДАМИ - International Sewage Pollution Prevention Certificate
- SASO (Saudi Arabian Standards Organization) Certified
- ETL (UL) – Listed to US electrical certification requirements
- U.K. – United Kingdom Department of Trade – FAST® Technology Approval
- U.S. Coast Guard – 33CFR159, MEPC.159(55) – FAST® Technology Approval for Type II MSD (Marine Sanitation Devices)
- U.S. EPA–ETV (Environmental Technology Verification) – validates the performance of technology that may improve the protection of the environment. – RetroFAST®, Report No. 03/08/WQPC-SWP – SeptiTech®, Report No. 02/04/WQPC-SWP

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