MAKE WAY
ENVIRONMENTAL TECHNOLOGIES INC.

Delta Environmental™
Pentair Water

WHITEWATER®

AEROBIC TREATMENT UNIT

DF DESIGN MANUAL

Make-Way Environmental Technologies, P.O. Box 1869, Exeter, Ontario, Canada N0M 1S7
Tel: 519.235.1176 • Toll free: 1.866.MAKE-WAY (625.3929) • Cell: 519.709.0681 • Fax: 519.235.0570 • Email: bert@makeway.ca • www.makeway.ca
PROTECTING OUR ENVIRONMENT

DELTA ENVIRONMENTAL PRODUCTS, INC.
WHITEWATER® AEROBIC TREATMENT UNITS

Delta Environmental Products, Inc, Whitewater® Aerobic Treatment Units (ATU) are designed for on-site disposal of domestic wastewater. The unit can achieve tertiary quality effluent with total removal efficiencies of 96 to 97 percent of the impurities in the original wastewater. The unit will enhance any type of disposal method used in an on-site disposal system. Delta's Whitewater® Aerobic Treatment Unit is used in direct discharge, leaching bed systems, shallow buried trench, area beds, and drip dispersal. With the enhanced water quality, any one of the above disposal means will function better and longer. For poorer soils, smaller lots, high water tables, and recreational areas, onsite disposal can be achieved effectively and economically.

Most septic tank failures are due to heavy BOD discharge into the soil which causes biological growth to form thus clogging the soil significantly. High BOD reduction can be achieved in advanced tertiary process. Delta Environmental Products, Inc. Whitewater® ATU is an advanced tertiary process. New types of disposal systems are being designed primarily to distribute the effluent evenly in the disposal field, but without considering the effluent quality these systems may not achieve the desired results.

There is growing concern over ground water contamination. Delta's Whitewater® Aerobic Treatment Unit can destroy up to 90% of virus, (99% with disinfection) and discharge nitrates less than 10 mg/l.

Delta's Whitewater® ATU is an effective and economical solution for the growing need of on-site disposal systems.

PROCESS DESCRIPTION

The Delta Environmental Products, Inc. Whitewater® Aerobic Treatment Unit utilizes the activated sludge and extended aeration methods of biological waste reduction.

The activated sludge process is a continuous flow biological treatment process characterized by a suspension of aerobic microorganism maintained in a relatively homogeneous state by the mixing and turbulence induced by aeration. The microorganisms oxidize organic impurities in the raw influent wastewater to carbon dioxide and water in the presence of dissolved oxygen produced by the plant's compressor.

Extended aeration is a modified version of the activated sludge process whereby the waste is maintained under long term aeration of typically 24 hours or more. This process produces the minimum amount of sludge and can handle widely varying hydraulic and biological flows. The operating mixed liquor suspended solids (MLSS) in the aeration zone of the unit rises to a relatively high level of 5,000 to 8,000 mg/l (parts per million). Under these conditions, the organisms are starved and forced to undergo partial auto-oxidation. Volatile compounds are partially driven off during aeration and metals are partially removed and accumulate in the sludge. The sludge is periodically removed from the units.

The extended aeration process is probably the most stable and easily operated of all the aerobic processes. A properly operating unit will not produce the "rotten-egg" odour that is common with septic tank systems. Delta's Whitewater® ATU also produces much cleaner effluent with the total removal efficiencies of 90% to 97% of the impurities in the original wastewater.

DESCRIPTION OF DELTA WHITEWATER® AEROBIC TREATMENT UNIT

The Delta Whitewater® Aerobic Treatment Units contain a conical clarifier supported inside the main tank. The space between the clarifier and the main tank wall is the aeration zone in which the raw influent is mixed with the plant's biology (MLSS) where it rapidly decomposes the impurities. The MLSS is hydraulically displaced into the clarifier from the bottom. Inside the clarifier, the clear treated water separates from the MLSS where clear water rises to the top and exits the treatment plant through the effluent pipes. The sludge residue in the clarifier settles back out through the bottom and is re-mixed in the aeration zone.

Multiple PVC air drop lines are placed along the main tank wall in the aeration zone. Air from the compressor is injected at a minimum rate of 2,100 cubic feet per pound of biological oxygen demand (BOD) in the raw wastewater.

The entire unit is suitable for burial with only the inspection ports, compressor, and alarm panel above ground. The units are manufactured in sizes between 1,900 to 10,000 litres per day.

All Delta DF series units are NSF International tested and approved to conform to ANSI/NSF standard #40, Class 1 effluent requirements. Whitewater® Aerobic Treatment units are also listed in the Ontario Building Code and are BMEC authorized.

SPECIFICATIONS FOR DELTA ENVIRNMENTAL PRODUCTS, INC

WHITEWATER® AEROBIC TREATMENT UNIT

MEETING ANSI/NSF INTERNATIONAL STANDARD 40, CLASS 1, OBC and BMEC

GENERAL SPECIFICATIONS

The treatment units described by these specifications, are the Delta Environmental Products, Inc. Model DF50FF, DF60FF, DF75FF, DF100FF, DF150FF, and DF150X2FF. The unit shall essentially consist of a fibreglass aeration tank, air diffusion system with blower assembly, and inner circular type conical clarifier.

OPERATING CONDITIONS

The treatment unit shall be capable of treating 1,900 litres to 10,000 litres average daily flow (ADF) of domestic raw sewage waste. Please refer to individual specification sheets for specific information and requirements.

CONSTRUCTION

Fiberglass Construction

The treatment unit's main tank shall be constructed of ¼ inch minimum thickness fiberglass. The tank shall be moulded of fiberglass reinforced polyester resin manufactured by the lay-up and spray technique to assure that the interior has a smooth resin rich finish.

Pre-treatment Tank

A pre-treatment tank shall be provided as shown on the plans to receive the incoming flow. The inlet tank shall be designed to collect large incoming solids. This shall be accomplished by extending the inlet pipe downward below the trash floatable zone and above the settling zone. The discharge pipe shall also be extended downward so as to draw pre-treated sewage from the median zone, keeping both floatable and settle-able solids out of the aeration tank.

Aeration Tank

The aeration tank shall be sized to provide a minimum of 24 hour hydraulic detention time at the average daily flow (ADF). Tank design shall be such as to provide efficient mixing and aeration, and to maintain hydraulic velocities sufficient to prevent depositions of solids.

Air Diffusion System

Air diffusion drop pipes of ¾ inch schedule 40 PVC pipe shall supply air to diffusers. Each pipe shall be slotted for proper air diffusion and designed for non-clogging.

Clarifier

The clarifier shall be designed so as to provide optimum liquid-solid separation and shall be sized to provide 8 hours hydraulic detention at the ADF rate. The clarifier shall be installed inside the main tank.

Aeration Blower

Provide one aeration blower system with sufficient capacity to furnish the treatment unit air requirements. The blower(s) shall be capable of delivering a minimum of 2,100 cubic feet per pound of BOD influent at the required discharge pressure.

Electrical Controls

An electrical control panel shall be furnished with each compressor that will protect the compressor from overload and failure to start. Included in the panel shall be a pressure switch alarm system that will sound an alarm upon loss of air supply as well as a high water alarm. System shall be ANSI/NSF International certified utilizing UL rated components in an indoor/outdoor NEMA 3R painted steel enclosure.

Piping

All necessary piping and valves inside the plant shall be PVC and provided by the manufacturer. At the exterior wall of the plant, as shown on the plans, the manufacturer shall provide properly sized inlet and outlet connections. The manufacturer shall not be responsible for piping or valves outside the plant. Contractor or owner shall be responsible for necessary piping and valves between all systems.

Workmanship and Experience

All workmanship and materials shall be of the highest quality. The waste treatment unit shall be the product of an experienced manufacturer actively engaged in manufacturing and research and development of sewage treatment facilities. NSF International test documents shall be available upon request of the Engineer.

Each Whitewater® model has the capability to treat a fixed volume of raw domestic sewage. It is very simple to determine which model to use for each project (residence).

1. Use Table 8.2.1.3.A. of the Ontario Building Code to determine the design flow for a residential occupancy.
2. Once the design flow has been calculated, use the chart below to determine which Whitewater® model to use.

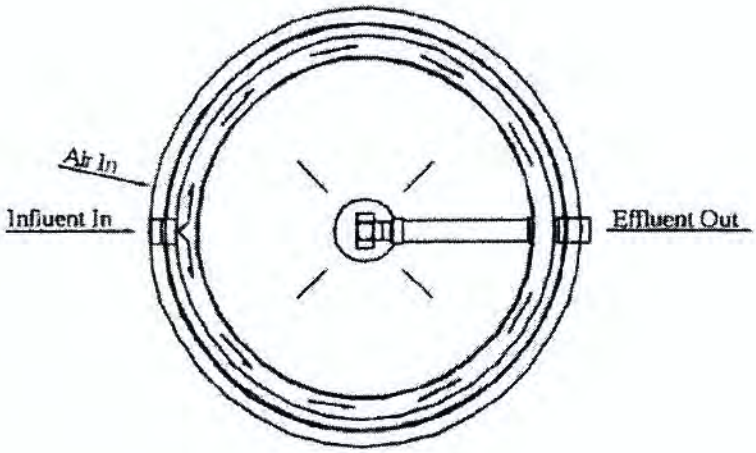
DF SERIES
TREATMENT PLANTS – SIZES/CAPACITIES

Whitewater® Model #	Size (LPD)	BOD Treatment Capacity (lbs/day)
DF – 50FF	1,900	1.25
DF – 60FF	2,300	1.50
DF – 75FF	2,900	1.88
DF – 100FF	3,800	2.50
DF – 150FF	5,700	3.75
DF- 150X2FF	10,000	7.50

EXAMPLE

The design flow for a 4 bedroom home under 200 sq/m with less than 20 fixture count equals 2,000 L/D therefore use a DF60FF.

SPECIFICATIONS FOR WHITEWATER® AEROBIC TREATMENT UNITS



Plan View
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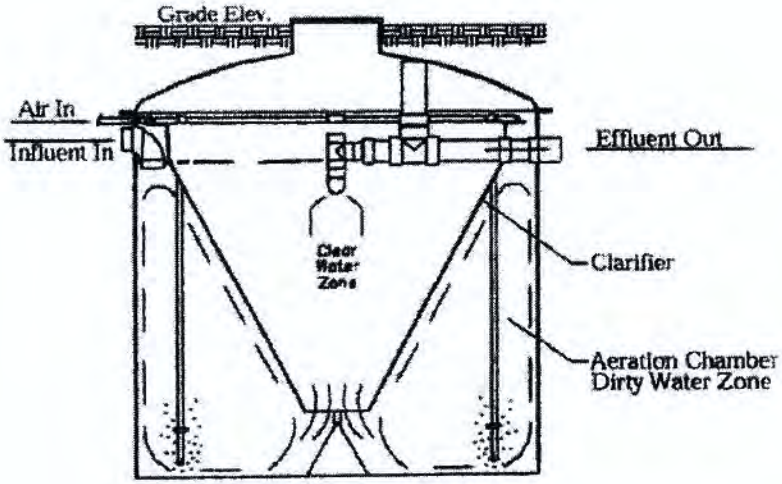


Section

Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727

FLOW DIAGRAM
TREATMENT PLANTS

DWN BY:	DATE:	SCALE:	DWG. NO.
B.LANDRY	06/19/03	N.T.S.	CRT600

SPECIFICATIONS FOR
WHITEWATER® AEROBIC TREATMENT UNIT
MODEL NO. DF50

GENERAL SPECIFICATIONS

The treatment unit described by these specifications is the Delta Environmental Products, Inc. Model DF50. The unit shall have a total volumetric capacity of 3.46cu.m. (763 imp. gals) and essentially consist of a fibreglass aeration tank, air diffusion system with blower assembly, and inner circular type conical upwelling clarifier. The unit shall be ANSI/NSF International, Standard 40, Class 1 approved, OBC and BMEC authorized.

OPERATING CONDITIONS

The treatment unit shall be capable of treating 1.89cu.m. (416 imp. gals) per day Average Daily Flow (ADF) of domestic raw sewage waste with a typical biological loading of up to 250 mg/l of BOD5, 250 mg/l of Suspended Solids, 10 mg/l of Fats, Oils, and Greases; with an organic loading of 0.567 kg (1.25 lbs) of BOD5 per day. Load figures are based on a design of seven (7) people and per capita daily BOD5 of 0.081 kg (0.178lbs) per day.

The treatment unit shall have air from a compressor injected at a minimum rate of 130.83cu.m. (2,100 cu. Ft.) per kg (lbs) of biological oxygen demand in the wastewater.

Aeration Tank

The aeration tank shall be sized to hold 2.4cu.m. (533 imp. Gals) to provide a minimum of twenty four (24) hour hydraulic detention time at the average daily flow (ADF). Tank design shall be such as to provide efficient mixing and aeration; and, to maintain hydraulic velocities sufficient to prevent depositions of solids.

Clarifier

The upwelling clarifier shall be sized to hold 1.04cu.m. (230 imp. gals.) to provide optimum liquid-solid separation and shall be sized to provide eight (8) hours hydraulic detention at the ADF rate. The clarifier shall be installed inside the main tank. The top 0.400cu.m. (88 imp. gals.) of the clarifier shall be sufficient to store treated effluent ready for discharge from the main treatment unit.

Aeration Blower/Compressor

Provide one (1) aeration blower system with sufficient capacity to furnish the treatment unit air requirements. The blower(s) shall be capable of delivering a minimum of 130.83cu.m. (2,100 cu. ft) per kg (lb) of BOD5 influent at the required discharge pressure.

Air Diffusion System

Air diffusion drop pipes of ¾ inch diameter schedule 40 PVC pipe shall supply air to diffusers. Each pipe shall be slotted for proper air diffusion and designed for non-clogging.

Electrical Controls

Air compressor shall be linear compressor design with 115V Single Phase 60Hz, 63 Watts electrical requirements. An electrical control panel shall be furnished with each compressor that will protect the compressor from overload and failure to start. Included in the panel shall be a pressure switch and alarm system that will sound an alarm upon loss of air supply as well as a high water alarm. System shall be ANSI/NSF International certified utilizing UL and CSA rated components in an indoor/outdoor NEMA 3R painted steel enclosure.

Piping

All necessary piping and valves inside the unit shall be PVC and provided by the manufacturer. At the exterior wall of the unit, as shown on the plans, the manufacturer shall provide properly sized inlet and outlet connections.

The manufacturer shall not be responsible for piping or valves outside the plant. Contractor or owner shall be responsible for necessary piping and valves between all systems.

Workmanship and Experience

All workmanship and materials shall be of the highest quality. The waste treatment unit shall be the product of an experienced manufacturer actively engaged in manufacturing and research and development of sewage treatment facilities. NSF International test documents shall be available upon request of the Engineer.

Construction

The main treatment unit tank may be constructed from fibreglass reinforced plastic (FRP) or from concrete in accordance to the following specifications.

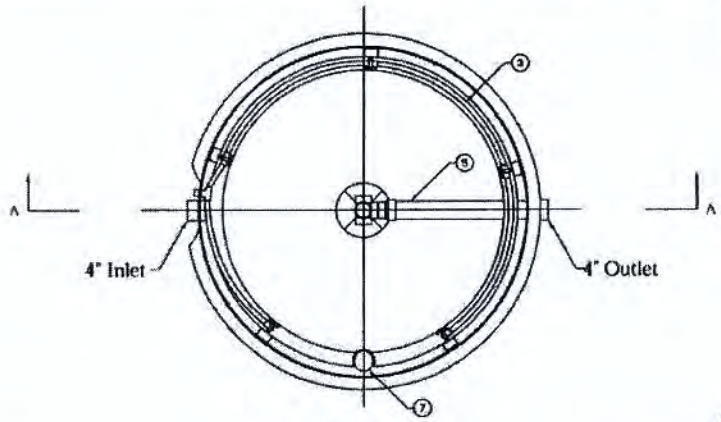
Fiberglass Construction

The treatment unit's main tank shall be constructed of 6.35 mm (¼ inch) minimum thickness FRP. The tank shall be moulded of FRP polyester resin manufactured by the lay-up and spray technique to assure that the interior has a smooth resin rich finish. The tank shall be constructed in accordance to Canadian Government Standards Board 41.22-93 for FRP vertical tanks for in ground installation.

Concrete Construction

The main treatment unit tank shall be constructed of 76.2mm (3 inch) thick, 3,000 PSI precast concrete. The top, bottom, and outer walls of all concrete tanks shall be 76.2mm (3 inch) thick plus or minus 6.35 mm (1/4 inch) and constructed of concrete with a minimum compressive strength of 3,000 PSI. The top, bottom, and side walls shall also be reinforced uniformly and completely with 10 gauge steel wire on 6" centers both ways or fibremesh reinforcement at a minimum of 1.2 pounds per yard Harborlight or equal.

Note: See dimension sheet for number of air drops



Plan View
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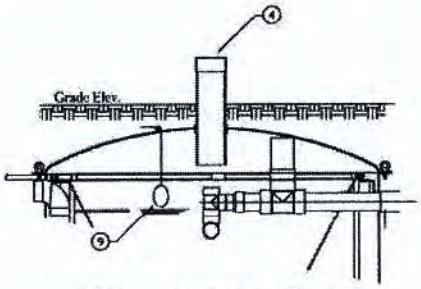

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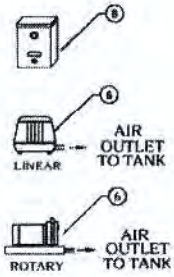
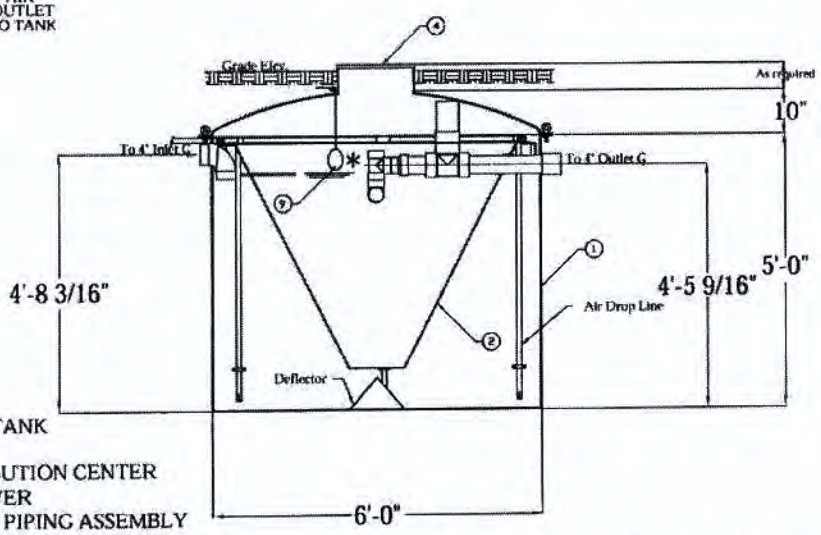




Section A-A

PARTS LIST

1 AERATION TANK
2 CLARIFIER
3 AIR DISTRIBUTION CENTER
4 ACCESS COVER
5 DISCHARGE PIPING ASSEMBLY
6 AIR PUMP ASSEMBLY
7 SAMPLE PORT
8 CONTROL PANEL

* HIGH LEVEL FLOAT NOT REQUIRED WHEN USING CP22 SERIES CONTROL PANELS

Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727

WASTEWATER TREATMENT UNITS
MODEL DF50-FF

DWN BY:	DATE:	SCALE:	DWG. NO.:
B.LANDRY	08/13/03	N.T.S.	DF50

SPECIFICATIONS FOR
WHITEWATER® AEROBIC TREATMENT UNIT
MODEL NO. DF60

GENERAL SPECIFICATIONS

The treatment unit described by these specifications is the Delta Environmental Products, Inc. Model DF60. The unit shall have a total volumetric capacity of 4.33cu.m. (955 imp. gals) and essentially consist of a fibreglass aeration tank, air diffusion system with blower assembly, and inner circular type conical upwelling clarifier. The unit shall be ANSI/NSF International, Standard 40, Class 1 approved, OBC and BMEC authorized.

OPERATING CONDITIONS

The treatment unit shall be capable of treating 2.27cu.m. (500 imp. gals) per day Average Daily Flow (ADF) of domestic raw sewage waste with a typical biological loading of up to 250 mg/l of BOD5, 250 mg/l of Suspended Solids, 10 mg/l of Fats, Oils, and Greases; with an organic loading of 0.680 kg (1.50 lbs) of BOD5 per day. Load figures are based on a design of nine (9) people and per capita daily BOD5 of 0.081 kg (0.178lbs) per day.

The treatment unit shall have air from a compressor injected at a minimum rate of 130.83cu.m. (2,100 cu. Ft.) per kg (lbs) of biological oxygen demand in the wastewater.

Aeration Tank

The aeration tank shall be sized to hold 3.2cu.m. (707 imp. gals) to provide a minimum of twenty four (24) hour hydraulic detention time at the average daily flow (ADF). Tank design shall be such as to provide efficient mixing and aeration; and, to maintain hydraulic velocities sufficient to prevent depositions of solids.

Clarifier

The upwelling clarifier shall be sized to hold 1.13cu.m. (248 imp. gals.) to provide optimum liquid-solid separation and shall be sized to provide eight (8) hours hydraulic detention at the ADF rate. The clarifier shall be installed inside the main tank. The top 0.481cu.m. (106 imp. gals.) of the clarifier shall be sufficient to store treated effluent ready for discharge from the main treatment unit.

Aeration Blower/Compressor

Provide one (1) aeration blower system with sufficient capacity to furnish the treatment unit air requirements. The blower(s) shall be capable of delivering a minimum of 130.83cu.m. (2,100 cu. ft) per kg (lb) of BOD5 influent at the required discharge pressure.

Air Diffusion System

Air diffusion drop pipes of ¾ inch diameter schedule 40 PVC pipe shall supply air to diffusers. Each pipe shall be slotted for proper air diffusion and designed for non-clogging.

Electrical Controls

Air compressor shall be linear compressor design with 115V Single Phase 60Hz, 63 Watts electrical requirements. An electrical control panel shall be furnished with each compressor that will protect the compressor from overload and failure to start. Included in the panel shall be a pressure switch and alarm system that will sound an alarm upon loss of air supply as well as a high water alarm. System shall be ANSI/NSF International certified utilizing UL and CSA rated components in an indoor/outdoor NEMA 3R painted steel enclosure.

Piping

All necessary piping and valves inside the unit shall be PVC and provided by the manufacturer. At the exterior wall of the unit, as shown on the plans, the manufacturer shall provide properly sized inlet and outlet connections.

The manufacturer shall not be responsible for piping or valves outside the plant. Contractor or owner shall be responsible for necessary piping and valves between all systems.

Workmanship and Experience

All workmanship and materials shall be of the highest quality. The waste treatment unit shall be the product of an experienced manufacturer actively engaged in manufacturing and research and development of sewage treatment facilities. NSF International test documents shall be available upon request of the Engineer.

Construction

The main treatment unit tank may be constructed from fibreglass reinforced plastic (FRP) or from concrete in accordance to the following specifications.

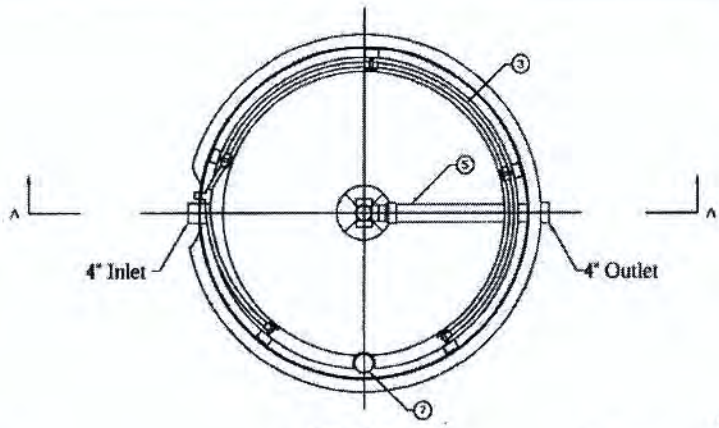
Fiberglass Construction

The treatment unit's main tank shall be constructed of 6.35 mm (¼ inch) minimum thickness FRP. The tank shall be moulded of FRP polyester resin manufactured by the lay-up and spray technique to assure that the interior has a smooth resin rich finish. The tank shall be constructed in accordance to Canadian Government Standards Board 41.22-93 for FRP vertical tanks for in ground installation.

Concrete Construction

The main treatment unit tank shall be constructed of 76.2mm (3 inch) thick, 3,000 PSI precast concrete. The top, bottom, and outer walls of all concrete tanks shall be 76.2mm (3 inch) thick plus or minus 6.35 mm (1/4 inch) and constructed of concrete with a minimum compressive strength of 3,000 PSI. The top, bottom, and side walls shall also be reinforced uniformly and completely with 10 gauge steel wire on 6" centers both ways or fibremesh reinforcement at a minimum of 1.2 pounds per yard Harborlight or equal.

Note: See dimension sheet for number of air drops



Plan View
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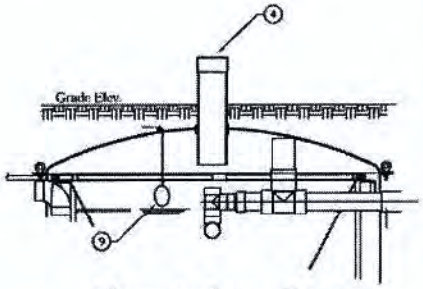

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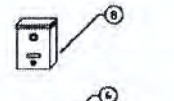
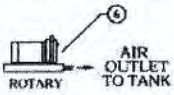
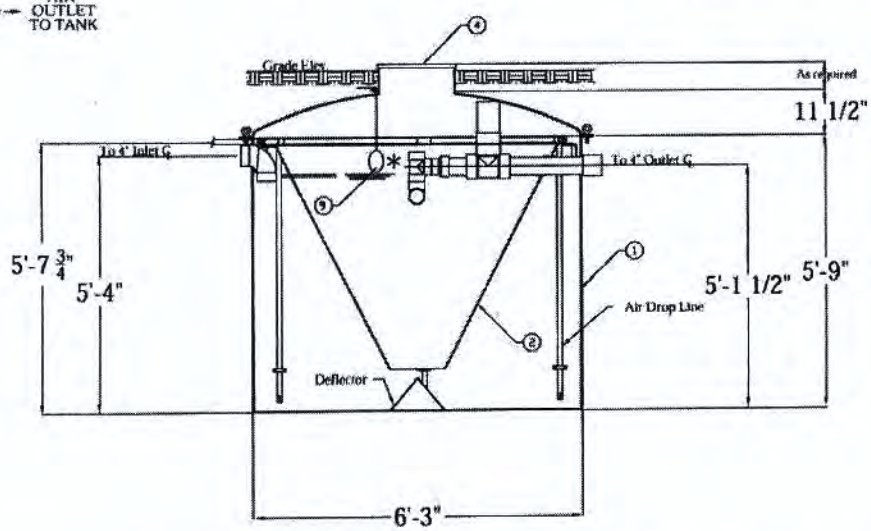






Section A-A

* HIGH LEVEL FLOAT NOT REQUIRED WHEN USING CP22 SERIES CONTROL PANELS

Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727

WASTEWATER TREATMENT UNITS
MODEL DF60-FF

DWN BY:	DATE:	SCALE:	DWG. NO.:
B.LANDRY	08/13/03	N.T.S.	DF 60FF

SPECIFICATIONS FOR
WHITEWATER® AEROBIC TREATMENT UNIT
MODEL NO. DF75

GENERAL SPECIFICATIONS

The treatment unit described by these specifications is the Delta Environmental Products, Inc. Model DF75. The unit shall have a total volumetric capacity of 5.43cu.m. (1,197 imp. gals) and essentially consist of a fibreglass aeration tank, air diffusion system with blower assembly, and inner circular type conical upwelling clarifier. The unit shall be ANSI/NSF International, Standard 40, Class 1 approved, OBC and BMEC authorized.

OPERATING CONDITIONS

The treatment unit shall be capable of treating 2.84cu.m. (625 imp. gals) per day Average Daily Flow (ADF) of domestic raw sewage waste with a typical biological loading of up to 250 mg/l of BOD5, 250 mg/l of Suspended Solids, 10 mg/l of Fats, Oils, and Greases; with an organic loading of 0.853 kg (1.88 lbs) of BOD5 per day. Load figures are based on a design of eleven (11) people and per capita daily BOD5 of 0.081 kg (0.788lbs) per day.

The treatment unit shall have air from a compressor injected at a minimum rate of 130.83cu.m. (2,100 cu. Ft.) per kg (lbs) of biological oxygen demand in the wastewater.

Aeration Tank

The aeration tank shall be sized to hold 3.8cu.m. (847 imp. gals) to provide a minimum of twenty four (24) hour hydraulic detention time at the average daily flow (ADF). Tank design shall be such as to provide efficient mixing and aeration; and, to maintain hydraulic velocities sufficient to prevent depositions of solids.

Clarifier

The upwelling clarifier shall be sized to hold 1.59cu.m. (350 imp. gals.) to provide optimum liquid-solid separation and shall be sized to provide eight (8) hours hydraulic detention at the ADF rate. The clarifier shall be installed inside the main tank. The top 0.600cu.m. (132 imp. gals.) of the clarifier shall be sufficient to store treated effluent ready for discharge from the main treatment unit.

Aeration Blower/Compressor

Provide one (1) aeration blower system with sufficient capacity to furnish the treatment unit air requirements. The blower(s) shall be capable of delivering a minimum of 130.83cu.m. (2,100 cu. ft) per kg (lb) of BOD5 influent at the required discharge pressure.

Air Diffusion System

Air diffusion drop pipes of ¾ inch diameter schedule 40 PVC pipe shall supply air to diffusers. Each pipe shall be slotted for proper air diffusion and designed for non-clogging.

Electrical Controls

Air compressor shall be linear compressor design with 115V Single Phase 60Hz, 63 Watts electrical requirements. An electrical control panel shall be furnished with each compressor that will protect the compressor from overload and failure to start. Included in the panel shall be a pressure switch and alarm system that will sound an alarm upon loss of air supply as well as a high water alarm. System shall be ANSI/NSF International certified utilizing UL and CSA rated components in an indoor/outdoor NEMA 3R painted steel enclosure.

Piping

All necessary piping and valves inside the unit shall be PVC and provided by the manufacturer. At the exterior wall of the unit, as shown on the plans, the manufacturer shall provide properly sized inlet and outlet connections.

The manufacturer shall not be responsible for piping or valves outside the plant. Contractor or owner shall be responsible for necessary piping and valves between all systems.

Workmanship and Experience

All workmanship and materials shall be of the highest quality. The waste treatment unit shall be the product of an experienced manufacturer actively engaged in manufacturing and research and development of sewage treatment facilities. NSF International test documents shall be available upon request of the Engineer.

Construction

The main treatment unit tank may be constructed from fibreglass reinforced plastic (FRP) or from concrete in accordance to the following specifications.

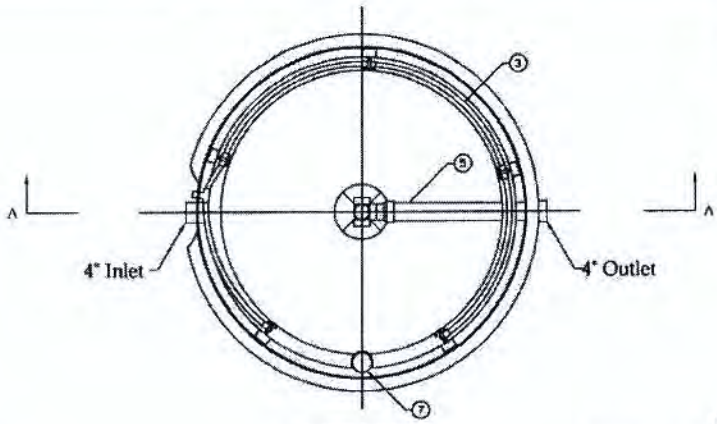
Fiberglass Construction

The treatment unit's main tank shall be constructed of 6.35 mm (¼ inch) minimum thickness FRP. The tank shall be moulded of FRP polyester resin manufactured by the lay-up and spray technique to assure that the interior has a smooth resin rich finish. The tank shall be constructed in accordance to Canadian Government Standards Board 41.22-93 for FRP vertical tanks for in ground installation.

Concrete Construction

The main treatment unit tank shall be constructed of 76.2mm (3 inch) thick, 3,000 PSI precast concrete. The top, bottom, and outer walls of all concrete tanks shall be 76.2mm (3 inch) thick plus or minus 6.35 mm (1/4 inch) and constructed of concrete with a minimum compressive strength of 3,000 PSI. The top, bottom, and side walls shall also be reinforced uniformly and completely with 10 gauge steel wire on 6" centers both ways or fibremesh reinforcement at a minimum of 1.2 pounds per yard Harborlight or equal.

Note: See dimension sheet for number of air drops



Plan View
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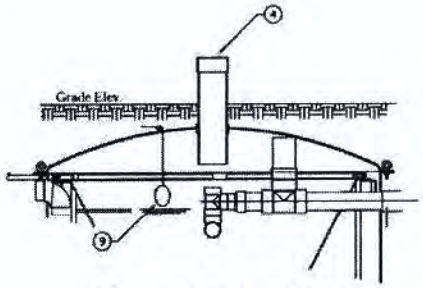

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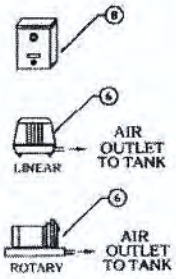
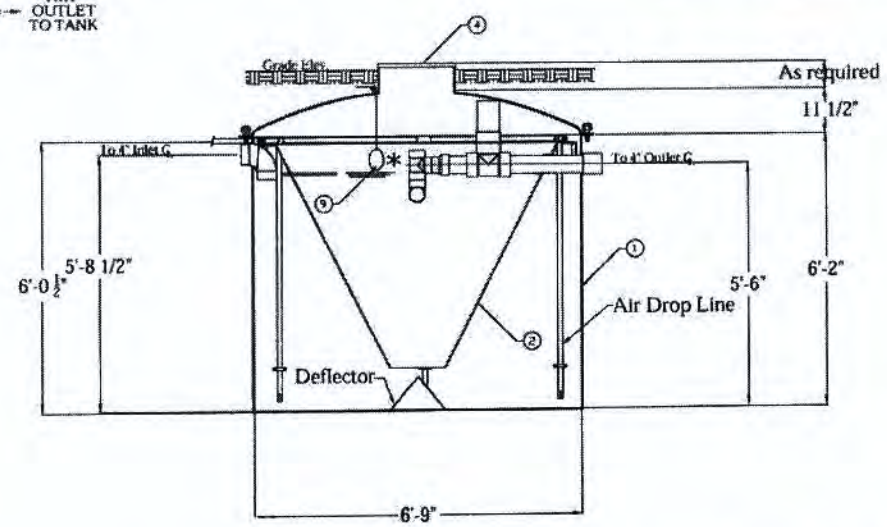




Section A-A

* HIGH LEVEL FLOAT NOT REQUIRED WHEN USING CP22 SERIES CONTROL PANELS

Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727

WASTEWATER TREATMENT UNITS
MODEL DF75-FF

DWN BY:	DATE:	SCALE:	DWG. NO.:
B.LANDRY	11/06/03	N.T.S.	DF 75FF

SPECIFICATIONS FOR
WHITEWATER® AEROBIC TREATMENT UNIT
MODEL NO. DF100

GENERAL SPECIFICATIONS

The treatment unit described by these specifications is the Delta Environmental Products, Inc. Model DF100. The unit shall have a total volumetric capacity of 7.28cu.m. (1,605 imp. gals) and essentially consist of a fibreglass aeration tank, air diffusion system with blower assembly, and inner circular type conical upwelling clarifier. The unit shall be ANSI/NSF International, Standard 40, Class 1 approved, OBC and BMEC authorized.

OPERATING CONDITIONS

The treatment unit shall be capable of treating 3.78cu.m. (833 imp. gals) per day Average Daily Flow (ADF) of domestic raw sewage waste with a typical biological loading of up to 250 mg/l of BOD5, 250 mg/l of Suspended Solids, 10 mg/l of Fats, Oils, and Greases; with an organic loading of 1.134 kg (2.50 lbs) of BOD5 per day. Load figures are based on a design of fourteen 914) people and per capita daily BOD5 of 0.081 kg (0.788lbs) per day.

The treatment unit shall have air from a compressor injected at a minimum rate of 130.83cu.m. (2,100 cu. Ft.) per kg (lbs) of biological oxygen demand in the wastewater.

Aeration Tank

The aeration tank shall be sized to hold 5.4cu.m. (1,198 imp. gals) to provide a minimum of twenty four (24) hour hydraulic detention time at the average daily flow (ADF). Tank design shall be such as to provide efficient mixing and aeration; and, to maintain hydraulic velocities sufficient to prevent depositions of solids.

Clarifier

The upwelling clarifier shall be sized to hold 1.85cu.m. (407 imp. gals.) to provide optimum liquid-solid separation and shall be sized to provide eight (8) hours hydraulic detention at the ADF rate. The clarifier shall be installed inside the main tank. The top 0.799cu.m. (176 imp. gals.) of the clarifier shall be sufficient to store treated effluent ready for discharge from the main treatment unit.

Aeration Blower/Compressor

Provide one (1) aeration blower system with sufficient capacity to furnish the treatment unit air requirements. The blower(s) shall be capable of delivering a minimum of 130.83cu.m. (2,100 cu. ft) per kg (lb) of BOD5 influent at the required discharge pressure.

Air Diffusion System

Air diffusion drop pipes of ¾ inch diameter schedule 40 PVC pipe shall supply air to diffusers. Each pipe shall be slotted for proper air diffusion and designed for non-clogging.

Electrical Controls

Air compressor shall be linear compressor design with 115V Single Phase 60Hz, 63 Watts electrical requirements. An electrical control panel shall be furnished with each compressor that will protect the compressor from overload and failure to start. Included in the panel shall be a pressure switch and alarm system that will sound an alarm upon loss of air supply as well as a high water alarm. System shall be ANSI/NSF International certified utilizing UL and CSA rated components in an indoor/outdoor NEMA 3R painted steel enclosure.

Piping

All necessary piping and valves inside the unit shall be PVC and provided by the manufacturer. At the exterior wall of the unit, as shown on the plans, the manufacturer shall provide properly sized inlet and outlet connections.

The manufacturer shall not be responsible for piping or valves outside the plant. Contractor or owner shall be responsible for necessary piping and valves between all systems.

Workmanship and Experience

All workmanship and materials shall be of the highest quality. The waste treatment unit shall be the product of an experienced manufacturer actively engaged in manufacturing and research and development of sewage treatment facilities. NSF International test documents shall be available upon request of the Engineer.

Construction

The main treatment unit tank may be constructed from fibreglass reinforced plastic (FRP) or from concrete in accordance to the following specifications.

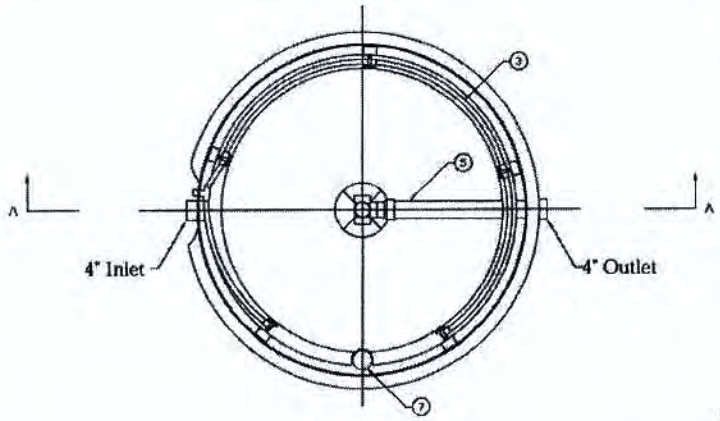
Fiberglass Construction

The treatment unit's main tank shall be constructed of 9.525 mm (3/8 inch) minimum thickness FRP. The tank shall be moulded of FRP polyester resin manufactured by the lay-up and spray technique to assure that the interior has a smooth resin rich finish. The tank shall be constructed in accordance to Canadian Government Standards Board 41.22-93 for FRP vertical tanks for in ground installation.

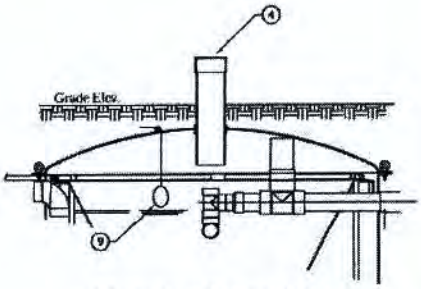
Concrete Construction

The main treatment unit tank shall be constructed of 76.2mm (3 inch) thick, 3,000 PSI precast concrete. The top, bottom, and outer walls of all concrete tanks shall be 76.2mm (3 inch) thick plus or minus 6.35 mm (1/4 inch) and constructed of concrete with a minimum compressive strength of 3,000 PSI. The top, bottom, and side walls shall also be reinforced uniformly and completely with 10 gauge steel wire on 6" centers both ways or fibremesh reinforcement at a minimum of 1.2 pounds per yard Harborlight or equal.

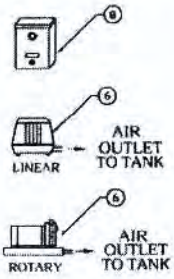
Note: See dimension sheet for number of air drops

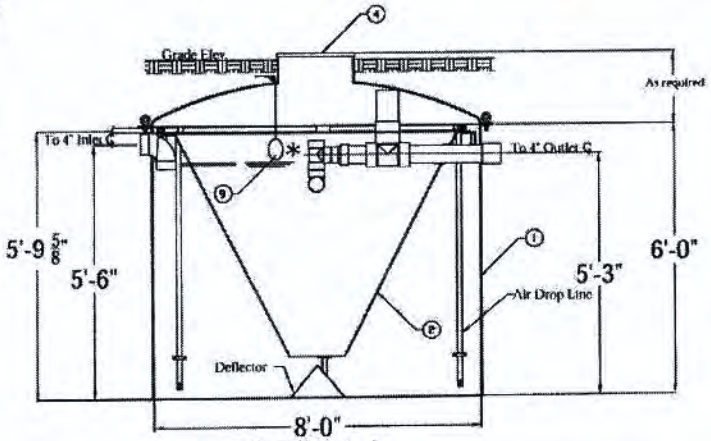


Plan View
(with cover removed)



Alternate Access Port





Section A-A

* HIGH LEVEL FLOAT NOT REQUIRED WHEN USING CP22 SERIES CONTROL PANELS

Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727

WASTEWATER TREATMENT UNITS
MODEL DF100A- FF

DWN BY:	DATE:	SCALE:	DWG. NO.:
B.LANDRY	06/19/03	N.T.S.	DF 100A

SPECIFICATIONS FOR
WHITEWATER® AEROBIC TREATMENT UNIT
MODEL NO. DF150

GENERAL SPECIFICATIONS

The treatment unit described by these specifications is the Delta Environmental Products, Inc. Model DF150. The unit shall have a total volumetric capacity of 10.89cu.m. (2,400 imp. gals) and essentially consist of a fibreglass aeration tank, air diffusion system with blower assembly, and inner circular type conical upwelling clarifier. The unit shall be ANSI/NSF International, Standard 40, Class 1 approved, OBC and BMEC authorized.

OPERATING CONDITIONS

The treatment unit shall be capable of treating 5.67cu.m. (1,250 imp. gals) per day Average Daily Flow (ADF) of domestic raw sewage waste with a typical biological loading of up to 250 mg/l of BOD5, 250 mg/l of Suspended Solids, 10 mg/l of Fats, Oils, and Greases; with an organic loading of 1.701 kg (3.75 lbs) of BOD5 per day. Load figures are based on a design of twenty two (22) people and per capita daily BOD5 of 0.081 kg (0.178lbs) per day.

The treatment unit shall have air from a compressor injected at a minimum rate of 130.83cu.m. (2,100 cu. Ft.) per kg (lbs) of biological oxygen demand in the wastewater.

Aeration Tank

The aeration tank shall be sized to hold 8.0cu.m. (1,770 imp. gals) to provide a minimum of twenty four (24) hour hydraulic detention time at the average daily flow (ADF). Tank design shall be such as to provide efficient mixing and aeration; and, to maintain hydraulic velocities sufficient to prevent depositions of solids.

Clarifier

The upwelling clarifier shall be sized to hold 2.86cu.m. (630 imp. gals.) to provide optimum liquid-solid separation and shall be sized to provide eight (8) hours hydraulic detention at the ADF rate. The clarifier shall be installed inside the main tank. The top 1.198cu.m. (264 imp. gals.) of the clarifier shall be sufficient to store treated effluent ready for discharge from the main treatment unit.

Aeration Blower/Compressor

Provide one (1) aeration blower system with sufficient capacity to furnish the treatment unit air requirements. The blower(s) shall be capable of delivering a minimum of 130.83cu.m. (2,100 cu. ft) per kg (lb) of BOD5 influent at the required discharge pressure.

Air Diffusion System

Air diffusion drop pipes of ¾ inch diameter schedule 40 PVC pipe shall supply air to diffusers. Each pipe shall be slotted for proper air diffusion and designed for non-clogging.

Electrical Controls

Air compressor shall be linear compressor design with 115V Single Phase 60Hz, 63 Watts electrical requirements. An electrical control panel shall be furnished with each compressor that will protect the compressor from overload and failure to start. Included in the panel shall be a pressure switch and alarm system that will sound an alarm upon loss of air supply as well as a high water alarm. System shall be ANSI/NSF International certified utilizing UL and CSA rated components in an indoor/outdoor NEMA 3R painted steel enclosure.

Piping

All necessary piping and valves inside the unit shall be PVC and provided by the manufacturer. At the exterior wall of the unit, as shown on the plans, the manufacturer shall provide properly sized inlet and outlet connections.

The manufacturer shall not be responsible for piping or valves outside the plant. Contractor or owner shall be responsible for necessary piping and valves between all systems.

Workmanship and Experience

All workmanship and materials shall be of the highest quality. The waste treatment unit shall be the product of an experienced manufacturer actively engaged in manufacturing and research and development of sewage treatment facilities. NSF International test documents shall be available upon request of the Engineer.

Construction

The main treatment unit tank may be constructed from fibreglass reinforced plastic (FRP) or from concrete in accordance to the following specifications.

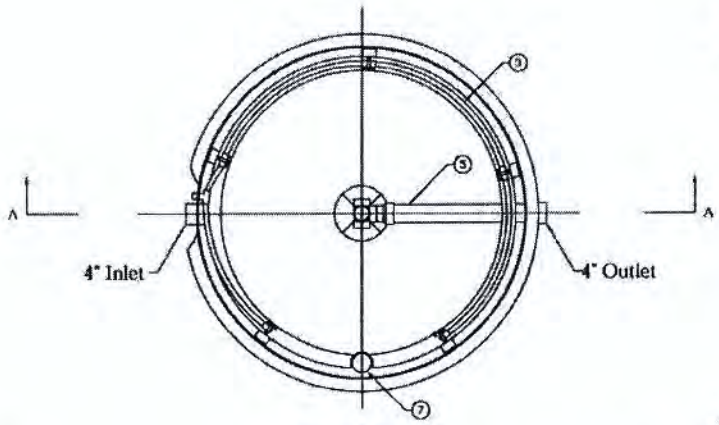
Fiberglass Construction

The treatment unit's main tank shall be constructed of 9.525 mm (3/8 inch) minimum thickness FRP. The tank shall be moulded of FRP polyester resin manufactured by the lay-up and spray technique to assure that the interior has a smooth resin rich finish. The tank shall be constructed in accordance to Canadian Government Standards Board 41.22-93 for FRP vertical tanks for in ground installation.

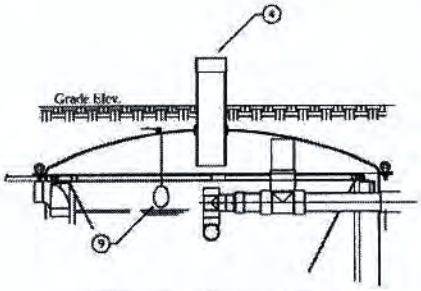
Concrete Construction

The main treatment unit tank shall be constructed of 76.2mm (3 inch) thick, 3,000 PSI precast concrete. The top, bottom, and outer walls of all concrete tanks shall be 76.2mm (3 inch) thick plus or minus 6.35 mm (1/4 inch) and constructed of concrete with a minimum compressive strength of 3,000 PSI. The top, bottom, and side walls shall also be reinforced uniformly and completely with 10 gauge steel wire on 6" centers both ways or fibremesh reinforcement at a minimum of 1.2 pounds per yard Harborlight or equal.

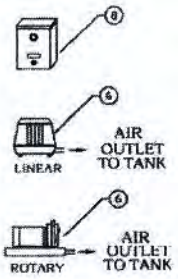
Note: See dimension sheet for number of air drops

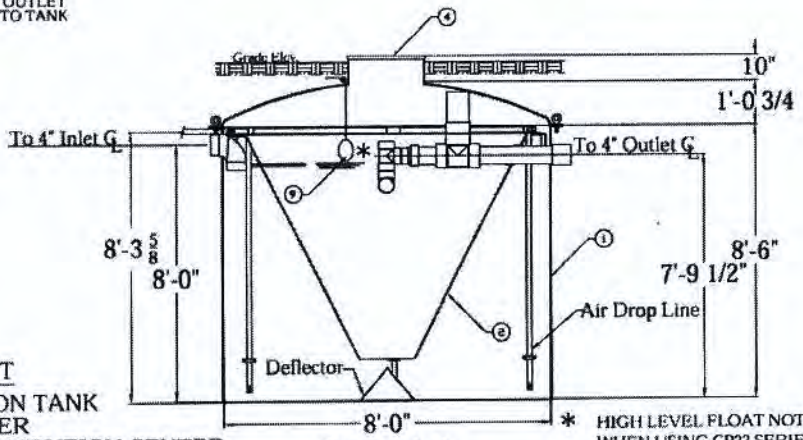


Plan View
(with cover removed)



Alternate Access Port





Section A-A

* HIGH LEVEL FLOAT NOT REQUIRED WHEN USING CP22 SERIES CONTROL PANELS

PARTS LIST

1 AERATION TANK
2 CLARIFIER
3 AIR DISTRIBUTION CENTER
4 ACCESS COVER
5 DISCHARGE PIPING ASSEMBLY
6 AIR PUMP ASSEMBLY
7 SAMPLE PORT
8 CONTROL PANEL

Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727

WASTEWATER TREATMENT UNITS
MODEL DF150-FF

DWN BY:	DATE:	SCALE:	DWG. NO.:
B.LANDRY	06/19/03	N.T.S.	DF 150FF

HOMEOWNER CARE AND OPERATION INSTRUCTIONS

The Whitewater® Aerobic Treatment Unit has been designed and built to provide long term, reliable, and efficient service. Once the unit has been installed (see installation instructions), the unit will operate with a minimum amount of attention.

Please reference the unit's Data Plates that are located on aerobic tank 24" cover, air pump, and the alarm panel in the event that a problem arises or service is required.

Step 1: Call your installer in the event service is required.
Step 2: Call Make-Way Environmental Technologies Inc., 1-866-625-3929, if unable to reach installer.

The following should be accomplished as checks for system failure:

Daily: Observe the warning device which comes on when the power to the air pump has been interrupted or when the air supply has malfunctioned. If the alarm is activated, check for a blown fuse or thrown circuit breaker. Check air pump to be sure it is operating. Once accustomed to the soft humming sound of a properly operating unit, any unusual noise is an indication of malfunction. If an unusual noise is detected or total failure is observed, call your installer for service.

Weekly: Check the treatment plant for offensive odour. If such a condition should develop, call for service.

Quarterly: **The air filter on the air pump should be cleaned**. Rinse with warm water if necessary. (See installation instructions). Do not use oil or other solvents.

Note: To keep maintenance to a minimum and ensure high effluent quality, the following items should **NOT** be permitted to enter the unit.

ITEMS NOT PERMITTED IN UNIT

- Strong disinfectants or bleaches, other than small amounts normally utilized in day to day cleaning and laundry (be conservative). Laundry detergents recommended for use that are low-sudsing, low phosphates, and biodegradable.
- Discharge from water softener.
- Any type of oils, greases, or other chemical wastes.
- Disposable baby diapers and wipes.
- Sanitary napkins, condoms, or other similar items.
- Hair, bandages, rags, or string.
- Latex, plastic, or metallic objects.
- Coffee beans, grounds, or cigarette butts.
- Mud or sticks
- Paper towels, napkins, or Kleenex
- Tidy Bowl type products.
- Beer waste or any other rich liquids.
- Garbage disposal should be used sparingly, not as a method of disposing all solid food waste. In order to endure good unit operation, waste should be disposed of in the garbage container.

The Whitewater® Aerobic Treatment Unit is designed to handle domestic wastewater and nothing else should go into it. For anything other than domestic wastewater, contact Make-Way Environmental Technologies Inc., 1-866-625-3929.

WARNINGS

1. **The proper operation of this or any other home sewage units depends upon proper organic loading and the life of the microorganisms inside the unit. Delta Environmental Products, Inc. is not responsible for the in-field operation of a unit, other than the mechanical and structural workings of the unit itself. We cannot control the amount of harsh chemicals or other harmful substances that may be discharged into the unit by the occupants of a household, we can only provide a comprehensive owner's manual that outlines substances that should be kept out of the system.**

2. **Hydraulic overloading (flows in excess of design flow) may cause the sewage treatment unit not to perform to the fullest capabilities.**

3. **Ants have been shown to be destructive to the air pump. Regular care should be taken to prevent infestation of ants near the system. Damage or destruction by ants is not covered under the manufacturer's warranty.**

4. **Your local Health Department or Regulator may require other pieces of equipment to function separately or in conjunction with equipment manufactured by Delta Environmental Products, Inc. Delta Environmental Products, Inc. is not responsible for the mechanical or electrical safety of equipment it does not manufacture or supply with its aerobic treatment unit. Particular care should be used in evaluating the electrical or mechanical safety of equipment manufactured by others. This may include but not limited to electrical control panels or air pumps.**

5. **If electrical service has not been installed for checking air distribution system installation, and if an extension cord is used to test the air pump, never leave the extension cord plugged in. Remove it after testing is completed.**

6. **Due to a possible fire hazard, DO NOT plug into service equipment or power pole and DO NOT use extension cords. All electrical work performed by the installer or others must be in accordance with the National Electrical Code and Local Codes.**

SOLIDS REMOVAL

The Whitewater® Aerobic Treatment Unit is designed to provide years or trouble free operation.

Determination of the need for solid removal can be done through a simple test. A one quart sample should be pulled from the aeration tank and can be done so through the 4" sample port. Allow the sample to settle in a clear one quart jar for one hour. If the solids content exceeds 60% of the total volume after settling, the treatment unit should be pumped out. Call your local authorized sewage disposal service to have the tank contents pumped out and disposed of properly.

The method of pumping out should be as follows:

- Remove any floating solids by skimming,
- The air pump must be operating to keep the solids in suspension.
- Pump out 80 to 90 percent of the tank volume with the suction pipe opening being placed at the tank bottom.

After the pump-out process is complete, fill the tank with fresh water to normal operating level.

Refer to the installation instructions to get the treatment plant back into operation.

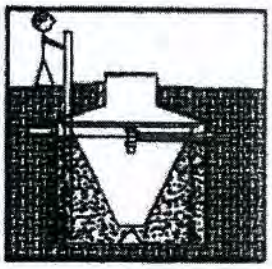
Should indication of improper operation be observed at any point in time,

Step 1: Call your installer in the event service is required.
Step 2: Call Make-Way Environmental Technologies Inc., 1-866-625-3929

NOTE: THE COST ASSOCIATED WITH PUMPING THE TREATMENT UNIT IS NOT COVERED UNDER WARRANTY AND IS NOT INCLUDED IN THE SERVICE POLICY.

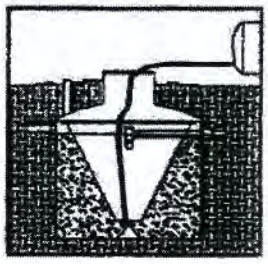
DELTA ENVIRONMENTAL PRODUCTS, INC.
PUMP OUT PROCEDURE

1. Determine the amount of MLSS by using a "Sludge Judge" type sampler.



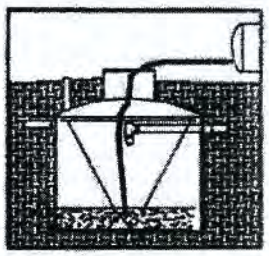
2. Leave the air compressor for the ATU running.

3. Insert vaccum hose into the main access riser Skim off any floatable solids on the surface of the clarifier and lower to the bottom of the clarifier.



Caution : Care must be taken not to damage the discarge tee assembly.

4. Pump out 80 to 90 percent of the ATU. Then remove the vacuum hose.

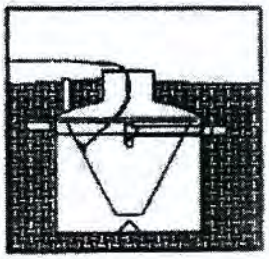


5. Insert a water hose into the main access riser. Wash down the clarifier walls and partially refill the ATU with clean water.

6. Repeat step 3 and refill the ATU with clean water.

*Never leave tank empty.

*Always use licensed pumpers/haulers for this task.



DELTA ENVIRONMENTAL PRODUCTS, INC.
P. O. BOX 969 DENHAM SPRINGS, LA 70727

PUMP OUT PROCEDURE

DWN BY:	DATE:	SCALE:	DWG. NO.:
B.LANDRY	04/09/03	N.T.S.	DEP033

SEASONAL USE GUIDELINES OF WHITEWATER® AEROBIC TREATMENT UNIT

These guidelines are for conditions as outlined below and apply for systems that are not in use for periods of time indicated. Site conditions not covered by the following must be forwarded to Delta Environmental Products, Inc. for recommended guidelines to meet the particular site conditions.

1. System not in use for more than one month and less than three months.
   Electrical power is left on and there are no frost conditions.
   - Leave air pump on and the unit running.

2. System not in use more than three months.
   Electrical power is turned off and there are no frost conditions.
   - While unit is operating with the air pump on, remove all material and liquid from tank.
   - Refill with clean water.
   - Turn off air pump.

3. System not in use more than three months.
   Electrical power is on and there are no frost conditions.
   - Leave air pump on and unit running; **OR**
   - While unit is operating with the air pump on, remove all material and liquid from the tank.
   - Refill with clean water.
   - Turn off air pump.

4. System not in use.
   Electrical power is turned off and there are frost conditions.
   - While unit is operating with the air pump on, remove all material and liquid from tank.
   - Turn off air pump.
   - If high ground water is present, fill with clean water.
   - If no ground water is present, leave tank empty.

UNDER NO CIRCUMSTANCES SHOULD THE AIR PUMP BE TURNED OFF FOR MORE THAN A FEW DAYS WITHOUT REMOVING TANK CONTENTS.

SAMPLE REQUIREMENTS

A Whitewater® Aerobic Treatment Unit properly operated and maintained should provide the following effluent quality of:

Biological Oxygen Demand 5 (BOD5) of less than 10mg/1 (or ppm);
Suspended Solids (SS) of less than 10mg/1 (or ppm);
PH of 6.0 to 9.0;
Dissolved oxygen 1.5 to 3.0 mg/1 (or ppm);

Taking Effluent Samples

Samples must be taken in the effluent discharge line or from the effluent pump chamber. We recommend allowing the effluent to flow through the discharge pipe for a minimum of two minutes before taking the sample. This will allow any solids to be flushed out that might have accumulated in the discharge pipe. Please find attached drawings of a Sample Port.

SAMPLING SHOULD BE TAKEN BY A LOCAL CERTIFIED TESTING LABORATORY OR BY FOLLOWING THEIR PROCEDURES. THE FOLLOWING RECOMMENDED GUIDELINES MAY BE USED IF LOCAL PROCEDURES ARE NOT AVAILABLE.

1. Biological Oxygen Demand (BOD)

   Samples for BOD analysis may degrade significantly during stage between collection and analysis, resulting in low BOD values. Minimize reduction of BOD by analyzing the sample promptly or by cooling it to near freezing temperature during storage. However, even at low temperature, keep the holding time to a minimum. Warm the chilled samples to 20°C before analysis; some storage time can be used to accomplish this conveniently.

   a. Grab Samples: If analysis is begun within two hours of collection, cooling is unnecessary. If analysis is not started within two hours of sample collection, keep sample at or below 4°C from the time of collection. Begin analysis with six hours of collection; when this is not possible because the sampling site is distant from the laboratory, store at or below 4°C and report length and temperature of storage to the Lab. In no case, start analysis more than 24 hours after grab sample collection. When samples are to be used for regulatory purposes, make every effort to deliver samples for analysis within six hours of collection.

2. Total Suspended Solids (TSS)

   Use resistant-glass or plastic bottles, provided that the material in suspension does not adhere to the container walls. Begin analysis as soon as possible, because of the impracticality of preserving the sample. Refrigerate sample at 4°C to minimize microbiological decomposition of the solids.

3. Phosphorous

   If phosphorus forms are to be differentiated, filter the samples immediately after collection. Preserve the samples by freezing at or below -10°C. Add 40mg/HgCI2/L to the samples, especially when they are to be stored for long periods. Do not add either acid or 2CHCI3 as a preservative when phosphorous forms are to be determined. If total phosphorous alone is to be determined, add 1 ml concentration HCL or freeze without additions.

   Do not store samples containing low concentrations of phosphorous in plastic bottles unless kept in a frozen state because phosphates may be absorbed onto the walls of plastic bottles.

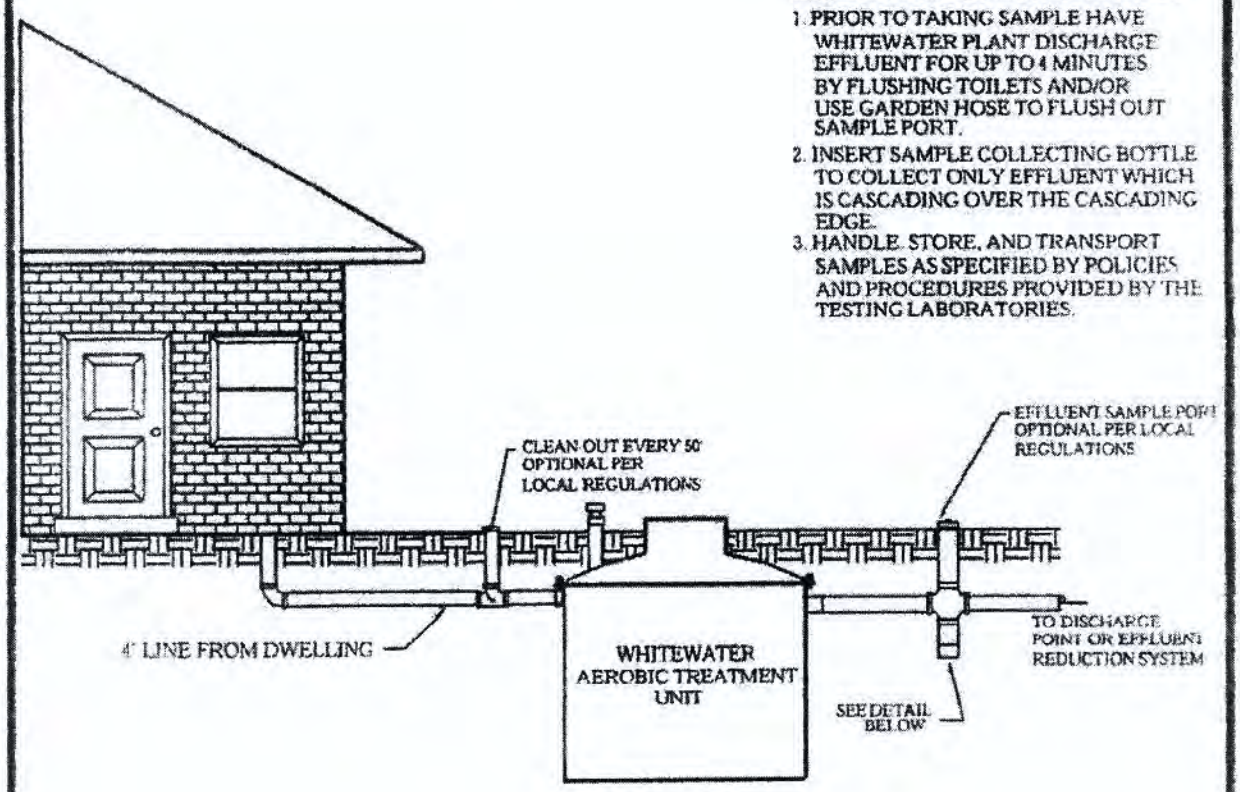
   Rinse all glass containers with hot diluted HCL, then rinse several times in distilled water. Never use commercial detergents containing phosphate for cleaning glassware used in phosphate analysis.

4. Ammonia Nitrogen

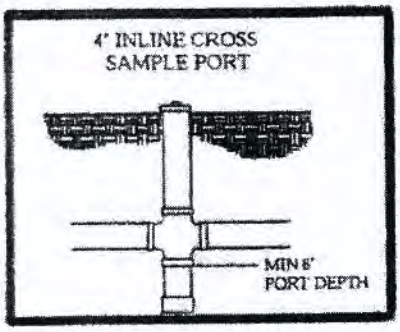
   Most reliable results are obtained on fresh samples. Destroy residual chlorine immediately after sample collection to prevent its reaction with ammonia. If prompt analysis is impossible, preserve the samples with 0.8 m; concentration H2SO4/L samples and store at 4°C. The PH of the acid-preserved samples should be between 1.5 and 5. Some wastewater may require more concentration of H2SO4 to achieve the PH. If acid preservation is used, neutralize samples with NaOH or KOH immediately before making the determination.

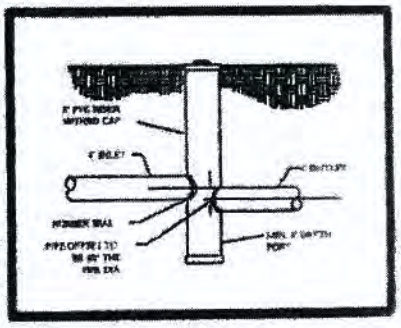
SAMPLE PROCEDURES:

1. PRIOR TO TAKING SAMPLE HAVE WHITEWATER PLANT DISCHARGE EFFLUENT FOR UP TO 4 MINUTES BY FLUSHING TOILETS AND/OR USE GARDEN HOSE TO FLUSH OUT SAMPLE PORT.
2. INSERT SAMPLE COLLECTING BOTTLE TO COLLECT ONLY EFFLUENT WHICH IS CASCADING OVER THE CASCADING EDGE.
3. HANDLE, STORE, AND TRANSPORT SAMPLES AS SPECIFIED BY POLICIES AND PROCEDURES PROVIDED BY THE TESTING LABORATORIES.



EXAMPLES OF SAMPLE PORTS





DELTA ENVIRONMENTAL PRODUCTS, INC.
P. O. BOX 969 DENHAM SPRINGS, LA 70727

SAMPLE PORTS

DWN BY:	DATE:	SCALE:	DWG. NO.:
B.LANDRY	06/24/03	N.T.S.	CRT361

INSTALLATION INSTRUCTIONS
ONLY FOR USE BY CERTIFIED, LICENCED INSTALLERS

1. Prepare an excavation, having a diameter approximately on foot larger than the tank and a depth that will allow approximately three inches of the inspection port to extend above normal ground level. Backfill with a six inch layer of sand or gravel if otherwise unable to provide a smooth, level, compact base. We recommend that the hole be roped off in some fashion to prevent injury to passerby.

2. Utilizing lift lugs provided, place the plant in the excavation so that the inlet and outlet line up with the sewer piping. The inlet line should slope down toward the unit and the outlet line should slope down away from the unit. The unit should be level within one-half inch, edge to edge.

3. Position inlet and outlet lines and make connections as necessary, depending upon the construction materials. The inlet line should be inserted and glued into the inlet elbow and the discharge/outlet line should be inserted and glued into the outlet coupling. Note: Open inspection port and make sure discharge tee assembly is level and centred in the clarifier prior to attaching discharge piping. Fill the tank with water until water flows from the discharge before back-filling. Backfill around the unit, up to the bottom of the discharge connections.

4. Do not install the air pump(s) in a low lying area where water may accumulate. The air pump should be installed near the control panel and within one hundred feet of the tank. Air pump can be installed outdoors or in a clean, well ventilated area, such as a tool room, garage, etc. **If the linear pump is to be installed in an additional enclosure, the enclosure must be approved by Delta in writing.**

5. Mount the control panel in an area such that the alarm can be heard and be readily observed. A 3-wire grounded GFI circuit is required for safety. Install a disconnect switch near the panel to visually disconnect the control panel from the power source. All electrical work must be done according to NEC and local code requirements. The control panel must be grounded. Connect the source ground wire to the ground location in the panel.

6. The control panel is rated for indoor and outdoor use and contains a fuse for the air pump. An electrical malfunction in the air pump or wiring to the air pump will cause the fuse to blow. The control panel also contains a pressure switch and visual and audible alarm. Loss of air pressure caused by the air pump system malfunction or a high water level in the treatment unit will cause the alarm to sound and the light to illuminate.

7. Attach control panel to suitable mounting surface using all four mounting holes on the back of the box. Use proper screws of sufficient length to ensure a secure and permanent mounting.

8. The control panel is rated for outdoor service; however, do not place it where it can be immersed in rising water or where run-off water, such as from a roof, will fall on it. Do not mount it where it is subject to wetting from sprinklers, hoses, etc.

9. The control panel must never be connected to a circuit that is not properly grounded. If there is doubt, have a qualified electrician check for proper grounding. The control panel must be connected to a 20 amp maximum electric source equipped with a ground fault interrupter (GFI) circuit breaker. A standard circuit breaker can be replaced with a GFI circuit breaker, which can be obtained from almost any store that sells electrical supplies.

10. After the control panel is properly mounted, connect conduit and install wiring as shown on drawings bound herein.

11. Install float switch wire from the control panel to the treatment unit. The wire can be direct burial type UF 600 volt or it can be installed in schedule 40 PVC conduit. Use type THWN 600 volt if installed in conduit. If in doubt, bury 24 inches deep. Keep sufficient distance or depth from air line to avoid confusion of pipes or damage to wiring during installation or repair or air piping. Connect to the float switch normally open contacts, using underground rated compound filled wire nuts.

12. Connect the pressure air tubing to the 1/8" barb-fitting in the air piping system.. The air tubing should be protected by conduit as shown on drawing.

13. Install ¾" schedule 40-PVC piping or 1" Poly pipe between air pump and treatment unit. A minimum of 12 inches ground cover is recommended.

14. Turn power on to control panel. The air pump should start.

15. Check air piping joints for leakage using a soapy water solution. Repair if necessary and then carefully backfill air line and inlet and discharge piping and cover unit to grade level.

16. Re-check water level in the tank.

17. Unit is ready to receive incoming sewage. No special start-up procedures are required. The process is naturally occurring and does not require any special additives.

18. Test alarm circuit by momentarily squeezing air tubing or remove tubing from barbed fitting and allowing air pressure to decrease. This should take only a few minutes. Alarm should sound. Release or replace air tubing and the alarm should stop. Lift float in the tank to horizontal position. Alarm should sound. Release float. Alarm should stop. The audible alarm can be turned off by flipping the toggle switch on the control panel's front door to the left.

19. Close cover to control panel, and lock if necessary.

20. In the event that a fuse blows, replace with time delay or slow blow, 125 volt minimum voltage rating and the same amp rating as the existing fuse.

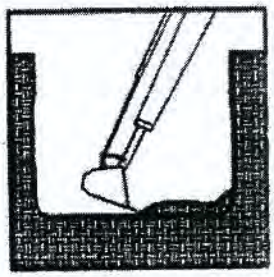
21. The distribution of air to all drop lines must be uniform. If the air flow is not evenly distributed, check the air pump or the main air line.

22. Spend time with your customer when possible. Review operation instructions. Be sure that the customer has a manual to keep. This saves valuable time avoiding return visits.

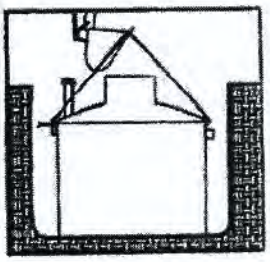
23. Retain these instructions for future reference.

24. **WARNING: CONTROL PANEL CONTAINS HIGH VOLTAGE AND MUST BE INSTALLED AND SERVICED BY QUALIFIED PERSONNEL.**

DELTA ENVIRONMENTAL PRODUCTS, INC.
RECOMMENDED INSTALLATION PROCEDURE

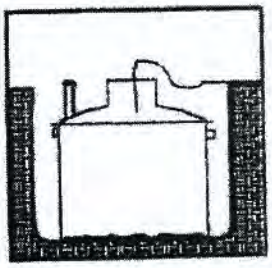


1. EXCAVATION:
Dig hole from the side for accurate sizing. This reduces the bridging distance between the tank and undisturbed soil and provides good support for inlet and outlet pipes. The bottom of the hole should be undisturbed and level. If leveling is necessary due to over excavation, use sand for fill.



NOTE: Never place tank directly on rock. place at least six inches of sand bedding between the tank and rock surface.

2. TANK PLACEMENT:
Use the back hoe to set the tank. Lifting lugs are furnished to lift the tank.



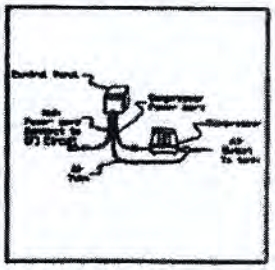
CAUTION: A small amount of soil or sand should be used around the bottom of the tank to hold it in place. Sand is best. If excavated soil is used, tamp it underneath the tank to provide a good base.

3. FILL TANK WITH WATER:
Place hose in six inch riser. Begin filling tank with water.

DELTA ENVIRONMENTAL PRODUCTS, INC. P. O. BOX 989 DENHAM SPRINGS, LA 70727	INSTALLATION PROCEDURE			
	DWN BY: B.LANDRY	DATE: 06/23/03	SCALE: N.T.S.	DWG. NO.: DEP034-A

4. GFI CONTROLS AND AIR PUMP

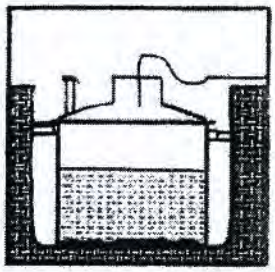
Install duplex or quadruple GFI or GFI protected receptacles at the selected location of the air pump. Mount control panel and install fittings, tubing and piping to tank location.



CAUTION: Do not plug anything but the air pump into the control panel.

5. INLET/OUTLET AND AIR CONNECTIONS

Properly make solvent cemented inlet, outlet and air connections.

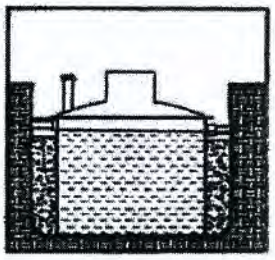


6. FILLING THE TANK

Finish filling tank with water until it drains out of outlet. Begin backfilling with natural soil or a good back fill material.

7. AIR DISTRIBUTION

Turn the air pump on and check all air connections and piping for air tightness. Observe air/water mixture through 4" riser.

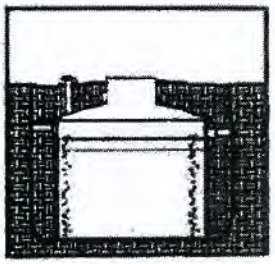


NOTE: If electrical GFI receptacle has not been installed, for checking air distribution system during installation. Use an extension cord to run the air pump. Never leave the extension cord plugged in. Remove it after inspection is completed.

WARNING : Possible Fire Hazard

Do Not plug into main service equipment on power pole.

Do Not use extension cords



8. FINAL BACK FILLING

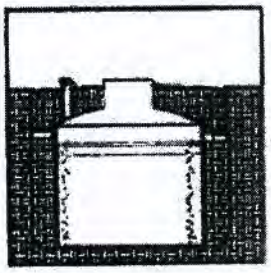
Back fill Should be mounded above grade slightly to allow for settling. Tamp the back fill beneath the inlet, outlet and air piping to provide good support.

DELTA ENVIRONMENTAL PRODUCTS, INC.
P. O. BOX 969 DENHAM SPRINGS, LA 70727

INSTALLATION PROCEDURE

DWN BY:	DATE:	SCALE:	DWG. NO.:
B.LANDRY	06/23/03	N.T.S.	DEP034-B

9. TRIM INSPECTION RISERS

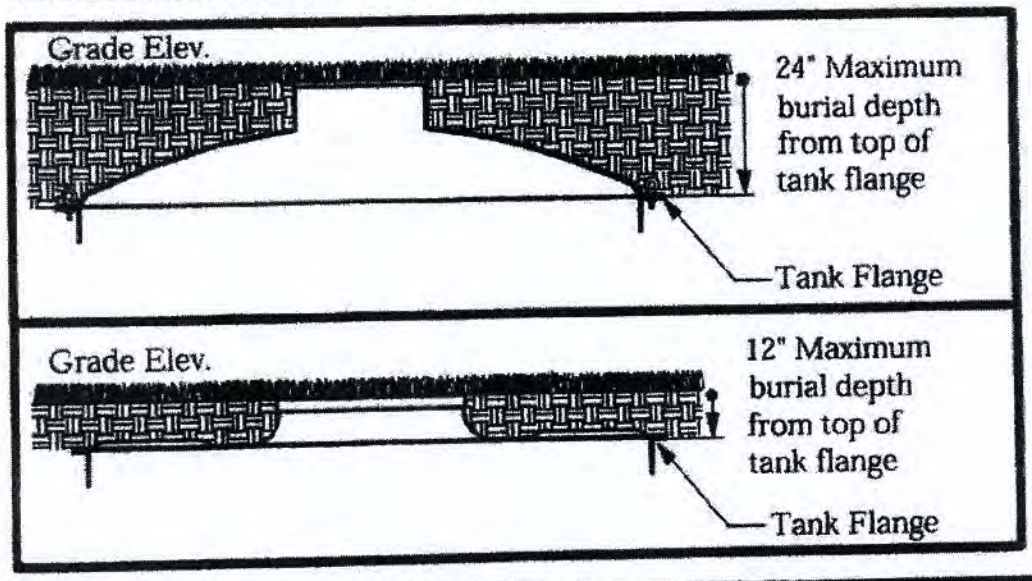


Trim inspection risers to proper length. The 4" aeration inspection riser also serves as a vent for the tank.

Caution: The bottom of the 4" aeration riser must be above the water level for both visual inspection and ventilation. Both of the optional 6" and 4" top caps must be above ground level to prevent ground water from entering the risers.

Caution: Care must be taken not to push the optional 6" Clarifier Inspection Riser down too far. This may cause damage to the effluent discharge tee assembly and the clarifier.

Caution: Maximum burial depth - 2 feet from top of tank flange with dome or 24" manways and 1 foot from top of tank flange with flat lids. For burial depths beyond 2 feet contact the factory.
For further details refer to the installation manual



DELTA ENVIRONMENTAL PRODUCTS, INC.
P. O. BOX 969 DENHAM SPRINGS, LA 70727

INSTALLATION PROCEDURE

DWN BY:	DATE:	SCALE:	DWG. NO.:
B.LANDRY	06/23/03	N.T.S.	DEP034-C

TROUBLESHOOTING GUIDE FOR WHITEWATER® AEROBIC TREATMENT UNIT

Air Supply Malfunction

1. Check to be sure all air drops are working properly. They should be bubbling evenly and forcefully. A septic (rotten egg) odour indicates that the unit is not getting enough air. If the air drops are not working, partially working, or working very little (slight bubbles), check the following:
    a. Check to be sure the air pump is working.
        - Check timer if one is used;
        - Bypass timer temporarily connect directly to source;
        - Check the electrical source;
        - If electrical source is okay, check service guide on pump unit for troubleshooting information;
        - Wash air filter on pump;
        - Consult manufacturer for servicing information.
    b. Check to be sure tank is not severely out of level. Air follows a path of least resistance. The pressure differences at the bottom of drop lines can be enough to prevent or restrict air flow.
    c. Check for broken or cracked air lines both outside and inside the tank.
    d. Ants will destroy an air pump. Check to see if there is ant nest around the air pump.
    e. Air pump should be protected from rising water.
    f. Always check to see if inlet and outlet lines are correctly installed.

Internal Assembly Malfunction

1. Raw, untreated sewage from the aeration chamber (bubble zone) should not enter the clarifier (quiet zone), because of improperly installed or loose seals or gaskets where pipe goes through the clarifier wall. Check the size of holes to be sure that there is no clearance for matter to pass through the wall around the piping.
2. Check to be sure all internal piping and connections are tight.

Design Overload

1. The system could be hydraulically overloaded (there is too much water going through the unit for the size of the unit).
2. The unit could be biologically overloaded (there is too much waste for the size of the unit).

Improper Installation or Settling

1. You should follow the manufacturer installation procedures very carefully.
2. Where settling is common, approximately 2 inches of sand should be placed and tamped in the bottom of the hole.
3. Proper installation is the first step in preventing call backs for service problems.
4. Whenever possible, it is important to spend time with the homeowner. Be sure they have an operations manual. A few minutes invested in the beginning will avoid service calls later.

No Harsh Chemicals Should Be Put Into the Unit

1. Water in the aeration chamber (bubble zone) should be the colour of chocolate milk. Blue or gray/blue water indicates heavy use of detergents or other chemicals. If water appears sudsy, there is too much detergent being used.
2. Water in the clarifier (quiet zone) should be clear but scum and debris may appear on the surface. Water is discharged into the discharge tee at a minimum of 6-8 inches below water surface. You MAY not be able to see clear water by looking into the tank. Samples must be taken at the sample port.
3. Oils and grease should be kept to a minimum. Grease tends to form in white balls.

Troubleshooting Electrical System

1. Air pump does not run:
   a. Check main service for power;
   b. Check and/or replace fuse with same rating as in the control panel.
2. Alarm does not occur when air pump is off:
   a. Malfunctioning pressure switch – replace.
   b. Malfunctioning light or buzzer – replace.
3. Alarm occurs continuously even when air pump is running:
   a. Air-leak in main air system or air tubing to pressure switch - repair leak or replace air line.
   b. Malfunctioning pressure switch – replace.
   c. High water level in tank – inspect for cause.
   d. Short in float switch wire or float switch- repair or replace.

NOTE: **All replacement parts are available from your local dealer.**

CAUTION: **Electrical shock or hazard may occur if the unit is not serviced properly. The manufacturer recommends that a licensed electrician be called when electrical problems occur.**

COMPONENT REPLACEMENT PROCEDURE

1. Air pump – Follow same procedure as outlined in the "Installation Instructions".

2. Float Switch - Remove the Whitewater® Aerobic Treatment Unit's riser or 24 inch cover. Locate float switch cable. Untie knot. Cut float switch cable. Slip float switch cable through rubber grommet into the unit. Replace with exact replacement float switch. Reinstall by reversing procedure. Reconnect float switch wires using Underground Rated Compound filled wire nuts. See Float Switch Mounting Detail.

3. Pressure Switch – Turn all power off to the control panel. Remove the back plate. Remove the screws securing the pressure switch as well as connectors and tubing. Reverse procedure to install new pressure switch.

4. Buzzer – Turn all power off to the control panel. Remove screw attaching buzzer to back plate as well as connectors. Reverse procedure to install new buzzer.

5. Lamp-holder – Turn all power off to the control panel. Remove lock nut securing the lamp-holder to door as well as connectors. Remove the lamp-holder. Install a new lamp-holder with the gaskets furnished. Continue with reverse procedure.

6. Lamp – Turn all power off to the control panel. Remove red lamp cover from front of control panel. Remove and replace lamp which is a push in type. Replace lamp cover and cover gasket.

7. Fuse – Turn all power off to the control panel. Pull top of fuse holder outward. Remove and replace fuse. Push fuse back into place.

8. Buzzer Switch – Turn all power off to the control panel. Remover rubber boot on switch. Remove hex nut from switch on panel front as well as connectors on switch. Reverse procedure to install new switch.

GENERAL COMMENTS

1. Only factory approved equipment can be used for replacement on individual treatment units.

2. If the decision is made to pump out a unit, be sure to contact a licensed waste hauler.

3. If a chronic problem develops and all items listed have been checked, consult with the manufacturer.

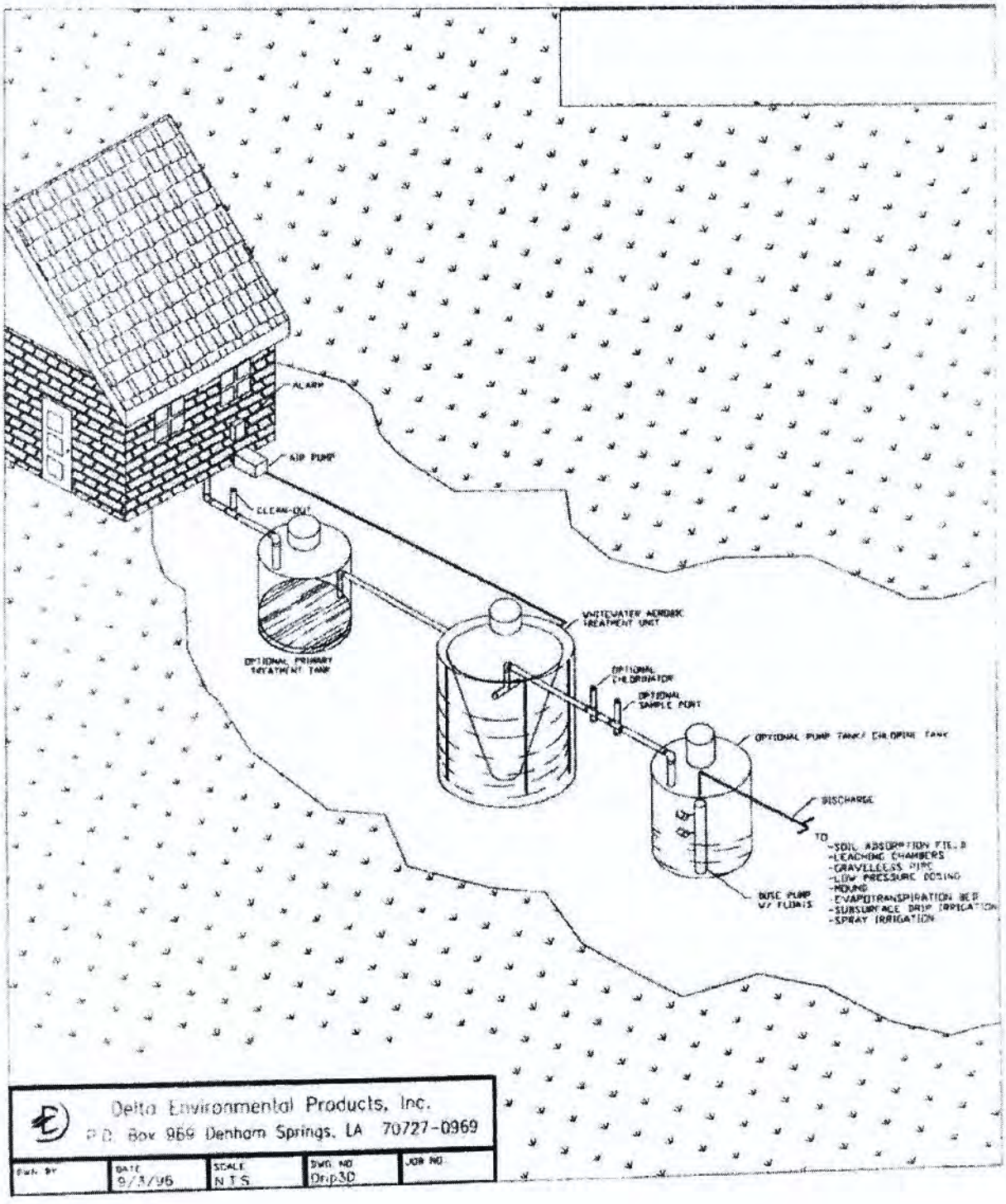
4. Taking pictures of units when troubleshooting will help document activity in the field.

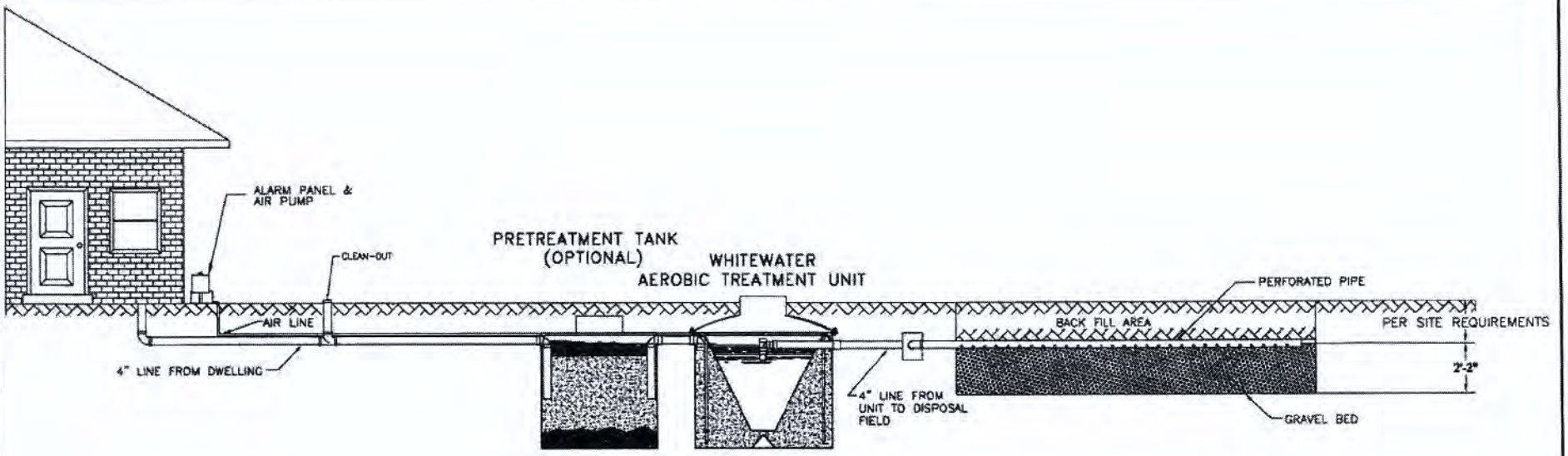
5. Keep good records.

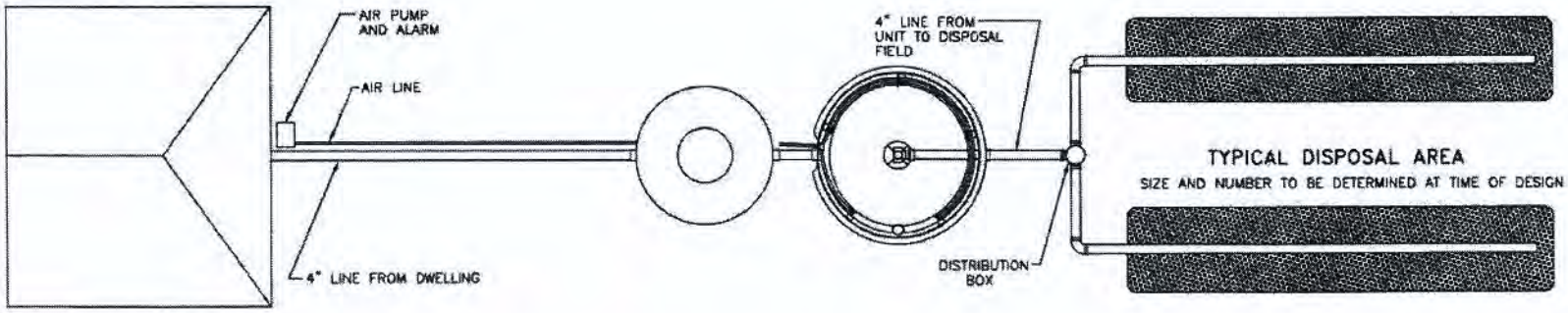
NOTE: If the entire cover needs to be removed on any of the various model treatment units, the existing silicone or strip seal must be removed and replaced with a new one. This will provide a positive seal which will not allow any infiltration into or out of the treatment unit.

SYSTEM LAYOUT DRAWINGS

Whitewater® Aerobic Treatment Unit – Produces Tertiary Quality Effluent, meeting table 8.6.2.2.A. of the OBC.





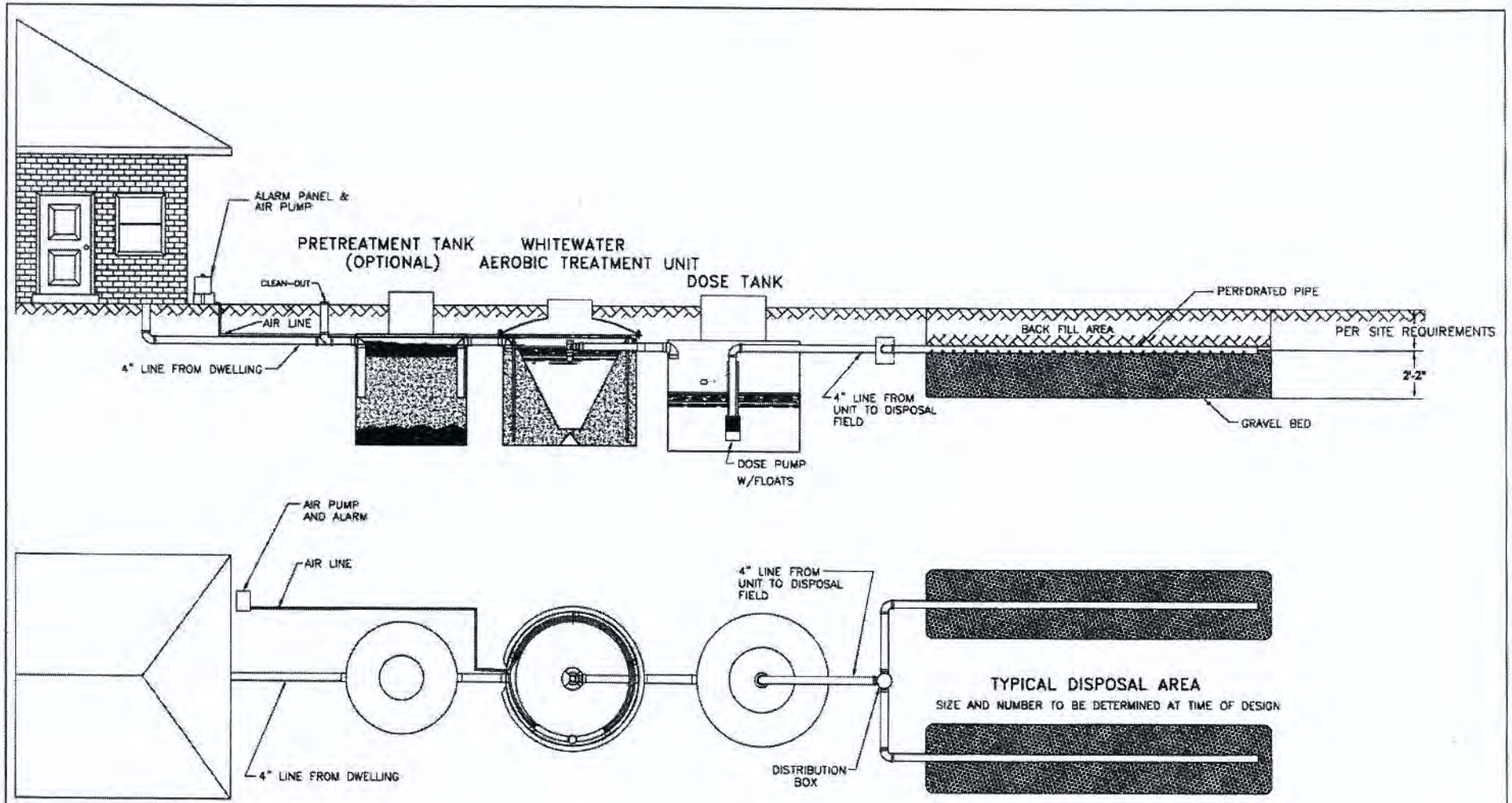


TYPICAL SINGLE FAMILY DWELLING INSTALLATION

GRAVITY / DRAIN FIELD DISPOSAL SYSTEM

Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727-0969

DWN BY:	DATE:	SCALE	DWG. NO.	JOB NO.
	9/3/96	N.T.S.	DFconventG	

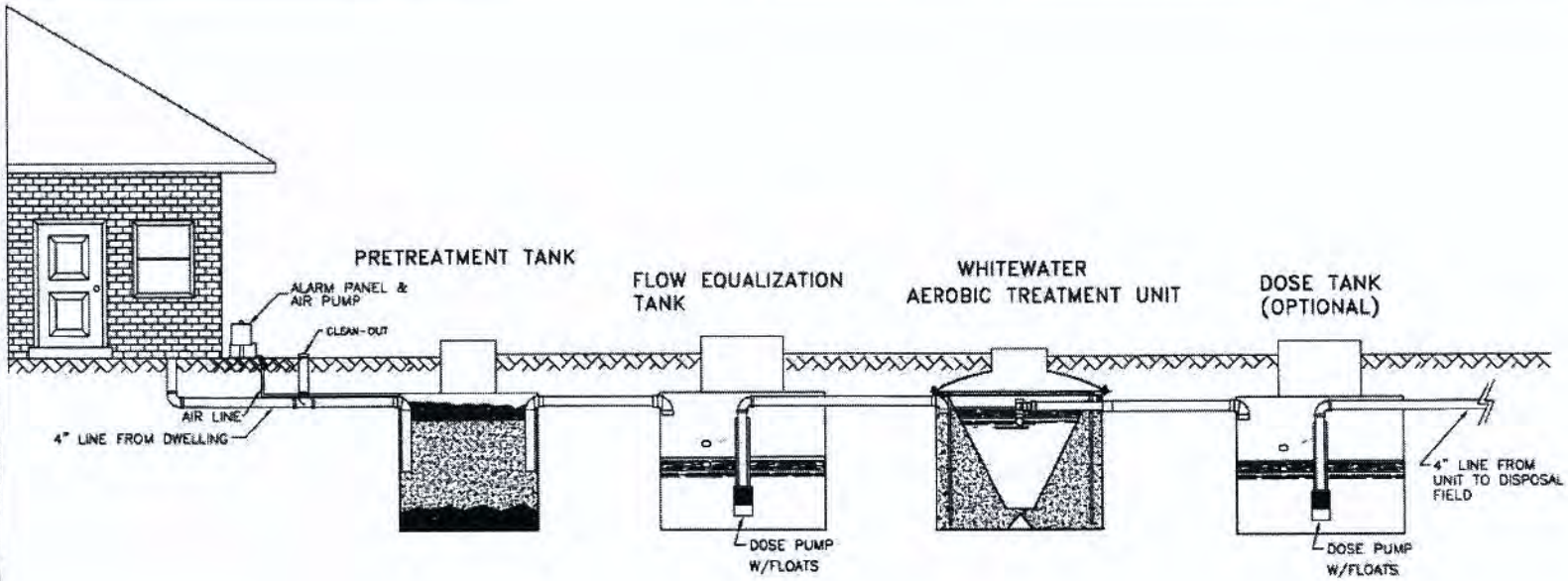


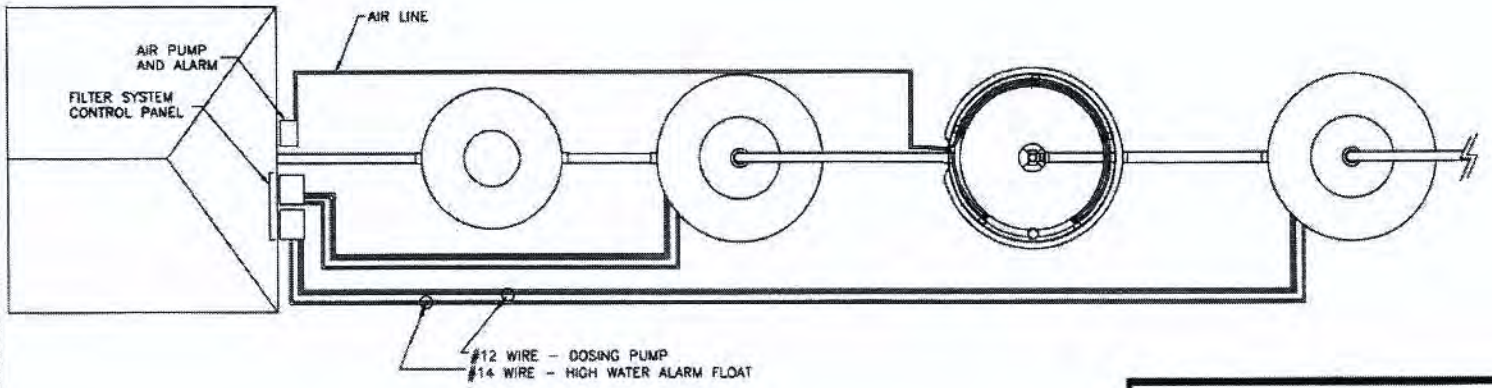
TYPICAL SINGLE FAMILY DWELLING INSTALLATION

PUMP/DRAIN FIELD DISPOSAL SYSTEM

Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727-0969

DWN BY:	DATE: 9/3/96	SCALE: N.T.S.	DWG. NO.: DFconventP	JOB NO.:



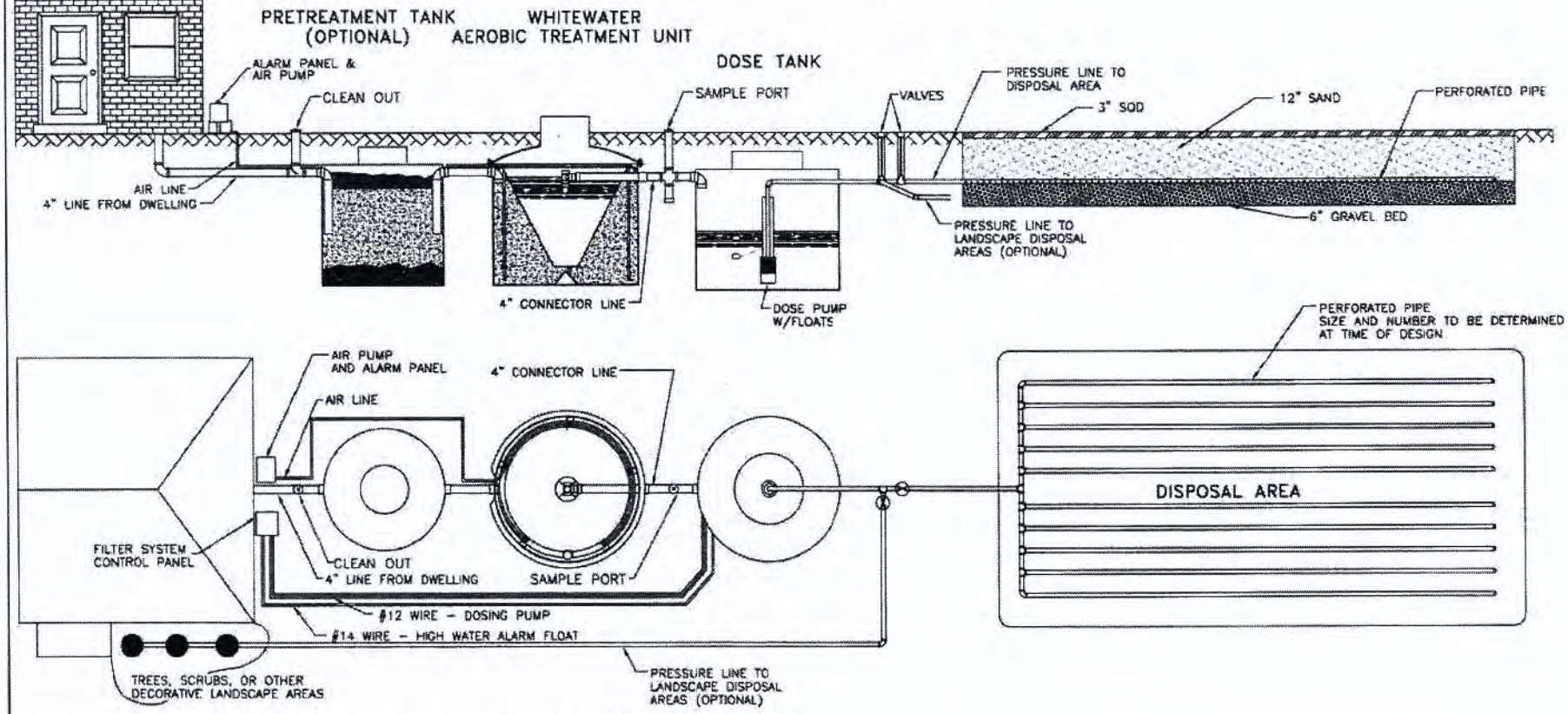


TYPCIAL INSTALLATION WITH FLOW EQUALIZATION SYSTEM

Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727-0969

DWN BY:	DATE:	SCALE:	DWG. NO.:	JOB NO.
	9/3/96	N.T.S.	DFfloweq	

ADVANTAGES: EFFECTIVE IN POOR PERCOLATION AREAS
ENHANCED DRAIN FIELD PERFORMANCE
EFFECTIVE IN HIGH WATER TABLE AREAS
VERSATILITY: I.E... LANDSCAPE IRRIGATION
NO FILTER REQUIRED
LOW OPERATING COST

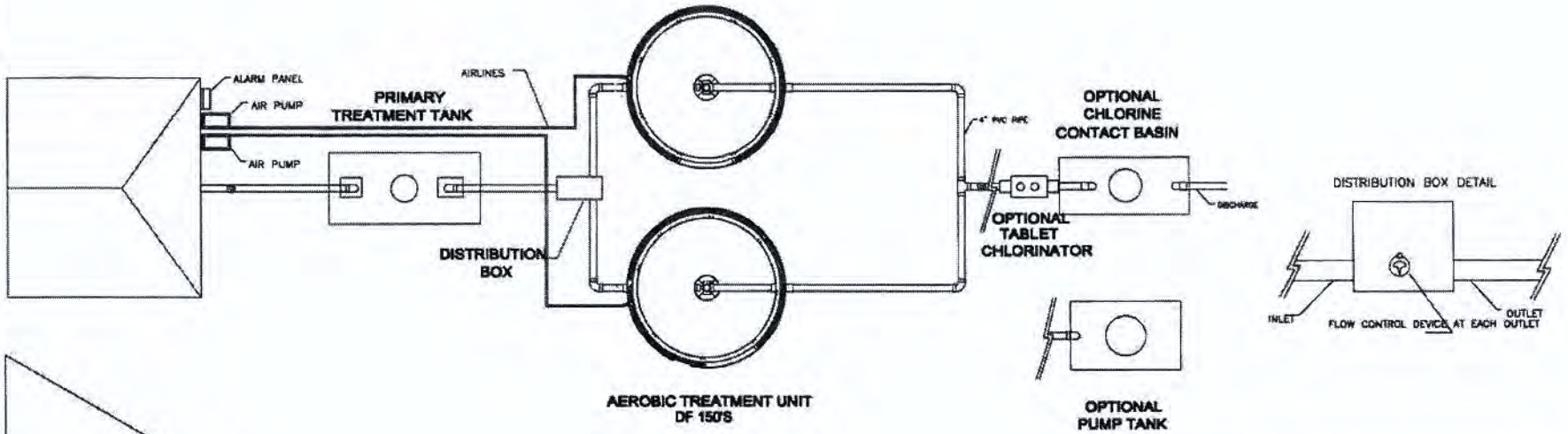


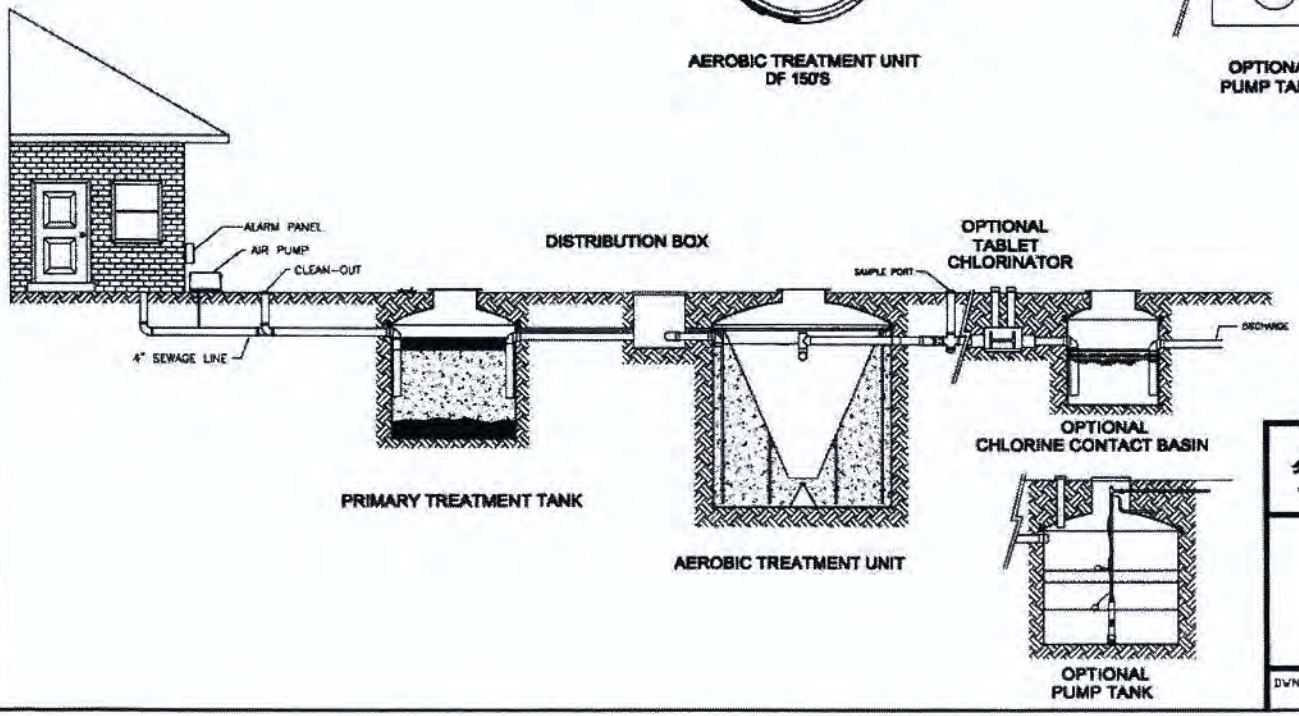
TYPICAL SINGLE FAMILY DWELLING INSTALLATION

LOW PRESSURE PIPING SYSTEM

Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727-0969

DWN BY:	DATE:	SCALE:	DWG. NO.:	JOB NO.:
	9/3/96	N.T.S.	DFlpp	





	MDF-200	MDF-300
DESIGN FLOW (GPD)	2,000	3,000
AERATION VOLUME (GAL)	2,940	4,454
BOD LOADING (LBS/DAY)	5.00	7.50
CFM REQUIREMENT	10.42	15.63
OPTIONAL EQUIPMENT		
CHLORINATOR	2 TUBE	2 TUBE
PRIMARY TREATMENT TANK	1,000-2,000	2,000-3,000
CLORINE CONTACT BASIN	52 GAL	78 GAL

Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727-0969

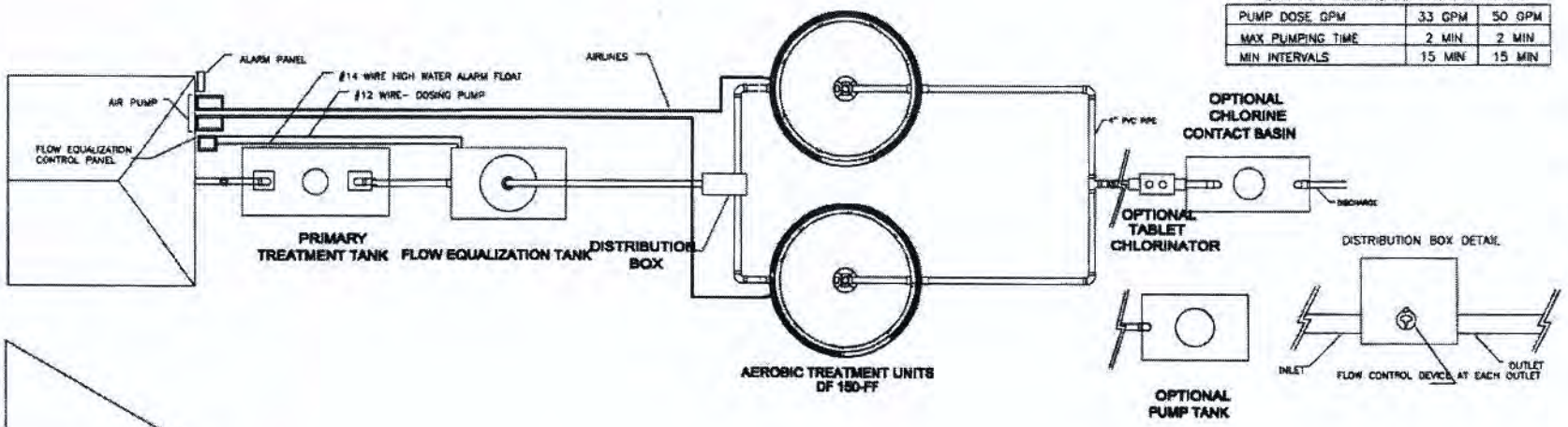
DELTA MODULAR AEROBIC TREATMENT UNITS MODEL MDF SERIES

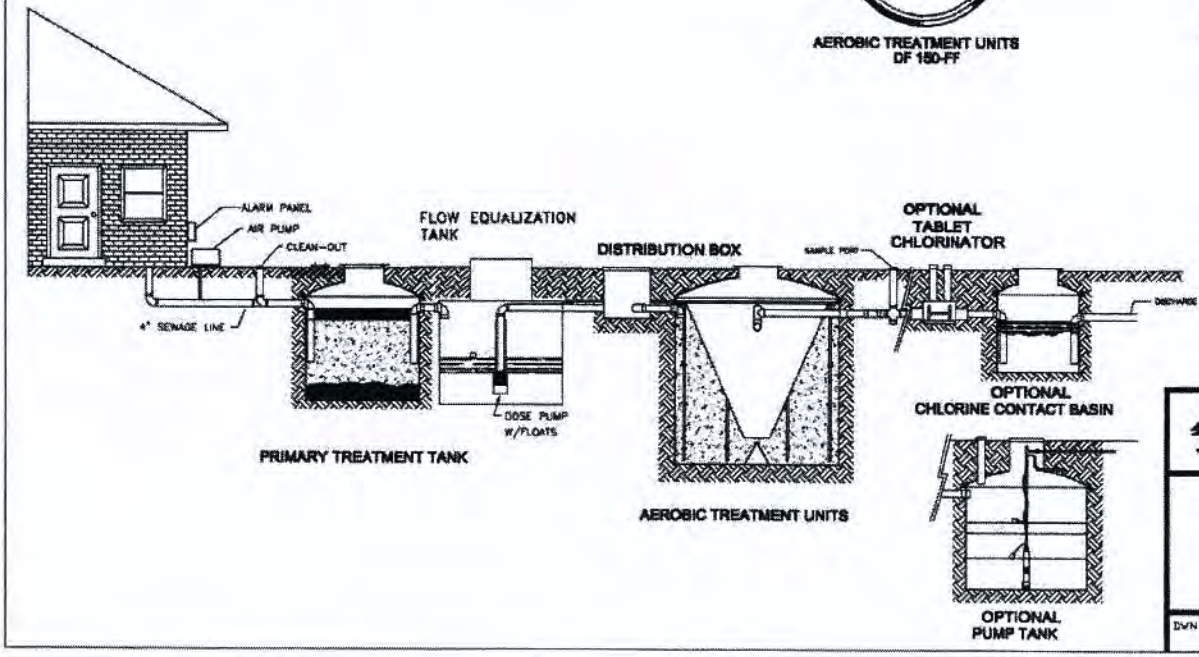
DWN BY:	DATE:	SCALE:	DWG. NO.	JOB NO.
	9/3/96	N.T.S.	DFMODULAR	JOB#

	MDF-200	MDF-300
DESIGN FLOW (GPD)	1,500-2,000	2,000-3,000
AERATION VOLUME (GAL)	2,940	4,454
BOD LOADING (LBS/DAY)	5.00	7.50
CFM REQUIREMENT	10.42	15.63
OPTIONAL EQUIPMENT		
CHLORINATOR	2 TUBE	2 TUBE
PRIMARY TREATMENT TANK	1,000-2,000	2,000-3,000
CLORINE CONTACT BASIN	52 GAL	78 GAL

PUMP DOSE VOLUME PER WHITEWATER UNIT

PUMP DOSE GPM	33 GPM	50 GPM
MAX PUMPING TIME	2 MIN	2 MIN
MIN INTERVALS	15 MIN	15 MIN



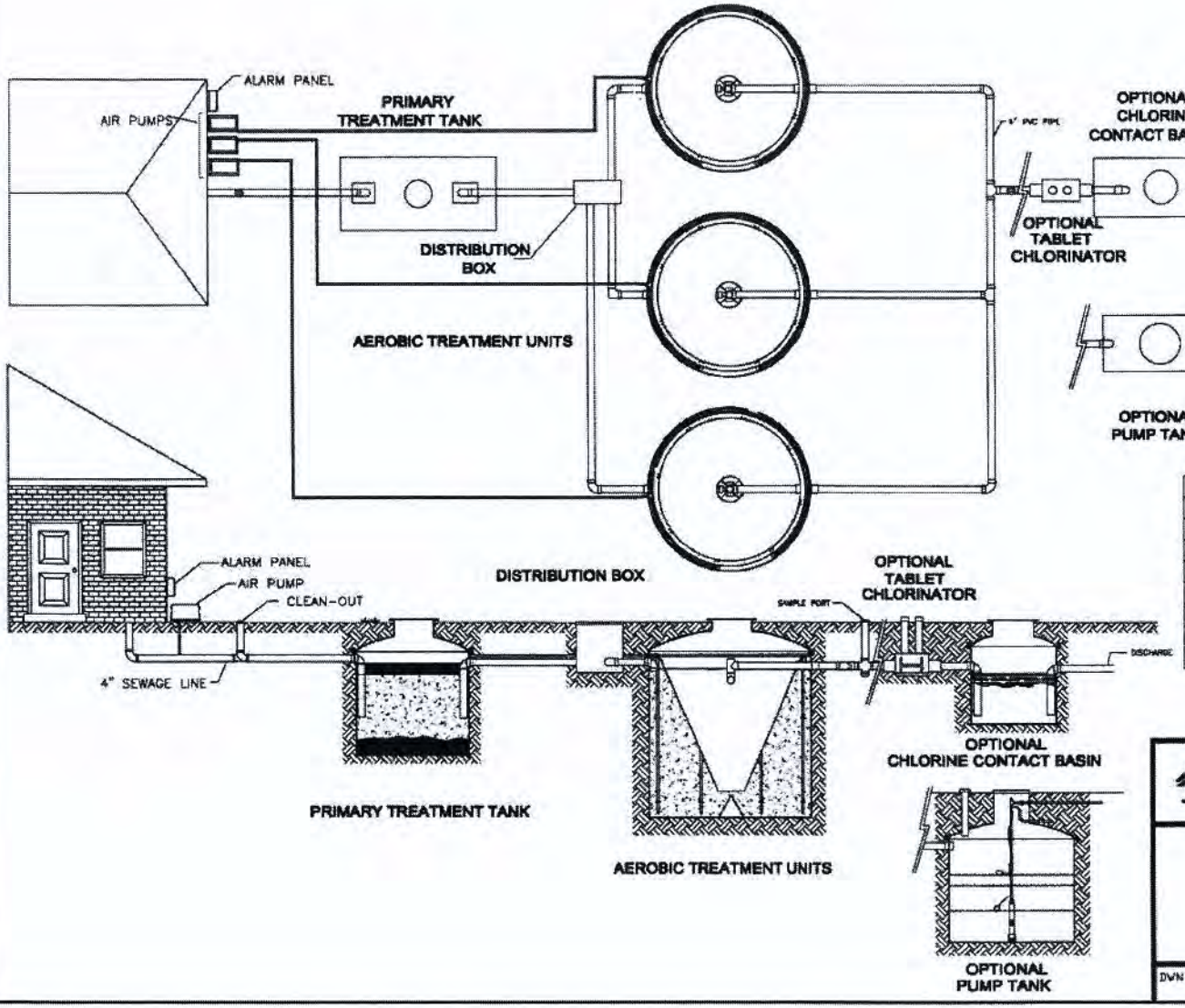


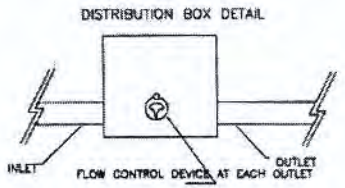
Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727-0969

DELTA MODULAR AEROBIC TREATMENT UNITS

WITH FLOW EQUALIZATION TANK MODEL MDF SERIES

DWN BY:	DATE:	SCALE:	DWG NO.:	JOB NO.
	9/3/96	N.T.S.	DFModularFQ	JOB#





	MDF-200	MDF-300	MDF-450	MDF-600
DESIGN FLOW (GPD)	2,000	3,000	4,500	6,000
AERATION VOLUME (GAL)	2,940	4,454	6,681	8,908
BOD LOADING (LBS/DAY)	5.00	7.50	11.25	15.00
CFM REQUIREMENT	10.42	15.63	23.43	31.25
OPTIONAL EQUIPMENT				
CHLORINATOR	2 TUBE	2 TUBE	2 TUBE	2 TUBE
PRIMARY TREATMENT TANK	1,000-2,000	2,000-3,000	2,000-4,000	4,000-6,000
CLORINE CONTACT BASIN	52 GAL	78 GAL	105 GAL	156 GAL

Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727-0969

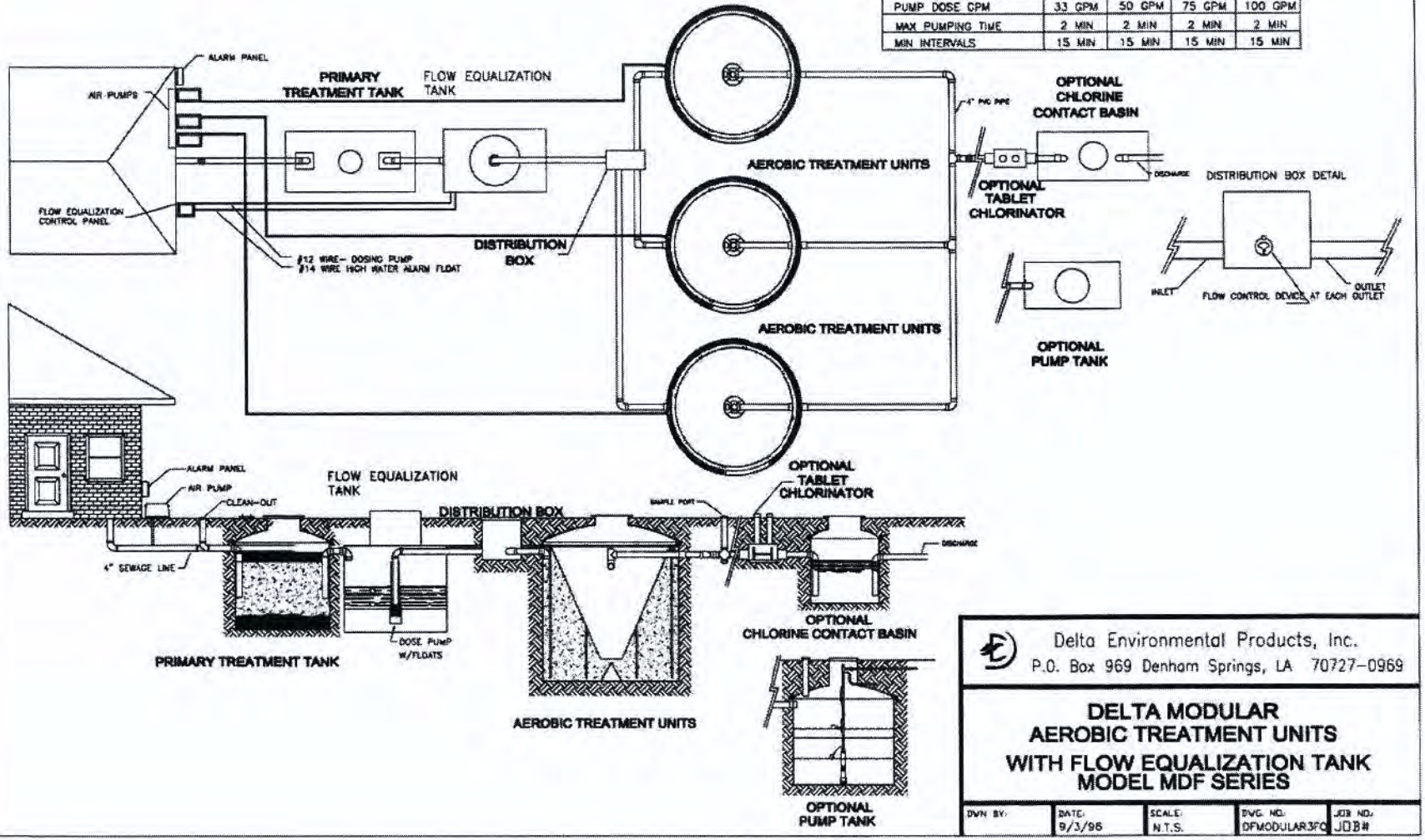
DELTA MODULAR AEROBIC TREATMENT UNITS MODEL MDF SERIES

DWN BY:	DATE:	SCALE:	DWG NO:	JOB NO:
	9/3/96	N.T.S.	DFMODULAR3	JOB#

	MDF-200	MDF-300	MDF-450	MDF-600
DESIGN FLOW (GPD)	1,500-2,000	2,000-3,000	2,000-4,000	4,000-6,000
AERATION VOLUME (GAL)	2,940	4,454	6,681	8,908
BOD LOADING (LBS/DAY)	5.00	7.50	11.25	15.00
CFM REQUIREMENT	10.42	15.63	23.43	31.25
OPTIONAL EQUIPMENT				
CHLORINATOR	2 TUBE	2 TUBE	2 TUBE	2 TUBE
PRIMARY TREATMENT TANK	1,000-2,000	2,000-3,000	2,000-4,000	4,000-6,000
CLORINE CONTACT BASIN	52 GAL	78 GAL	105 GAL	156 GAL

PUMP DOSE VOLUME PER WHITEWATER UNIT

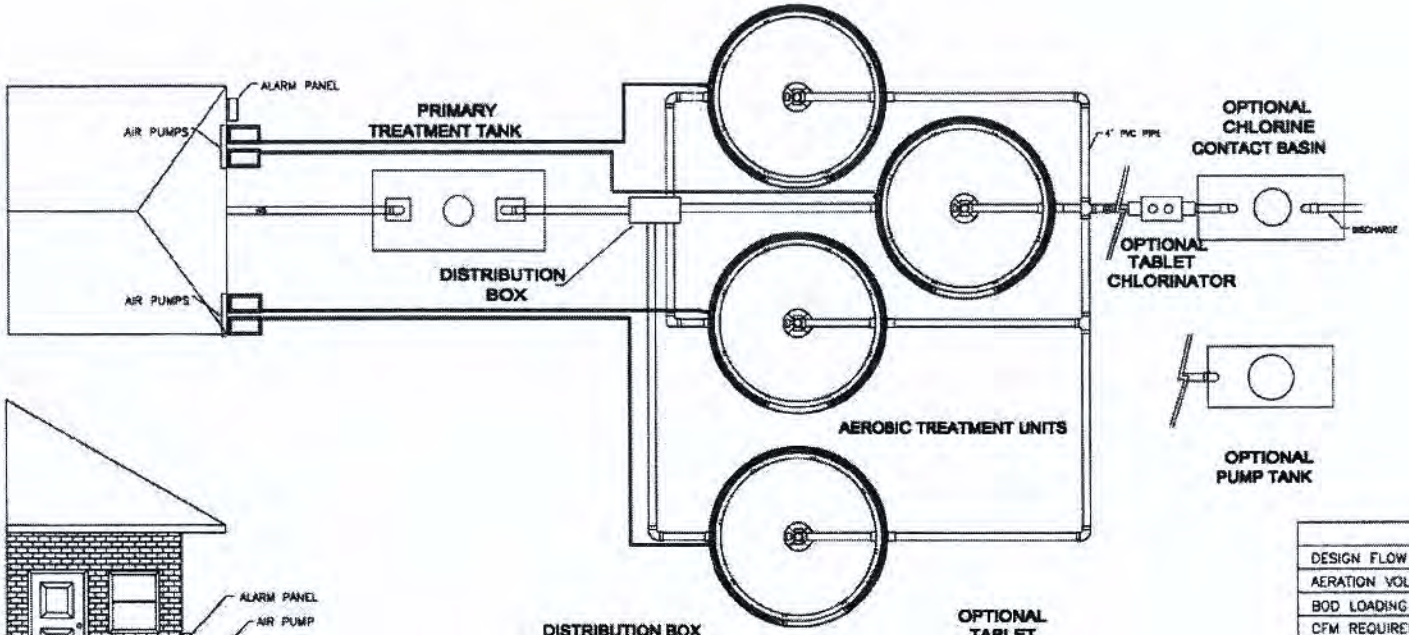
PUMP DOSE GPM	33 GPM	50 GPM	75 GPM	100 GPM
MAX PUMPING TIME	2 MIN	2 MIN	2 MIN	2 MIN
MIN INTERVALS	15 MIN	15 MIN	15 MIN	15 MIN

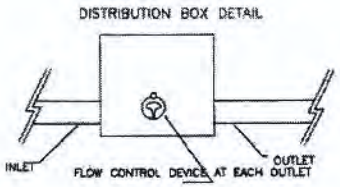


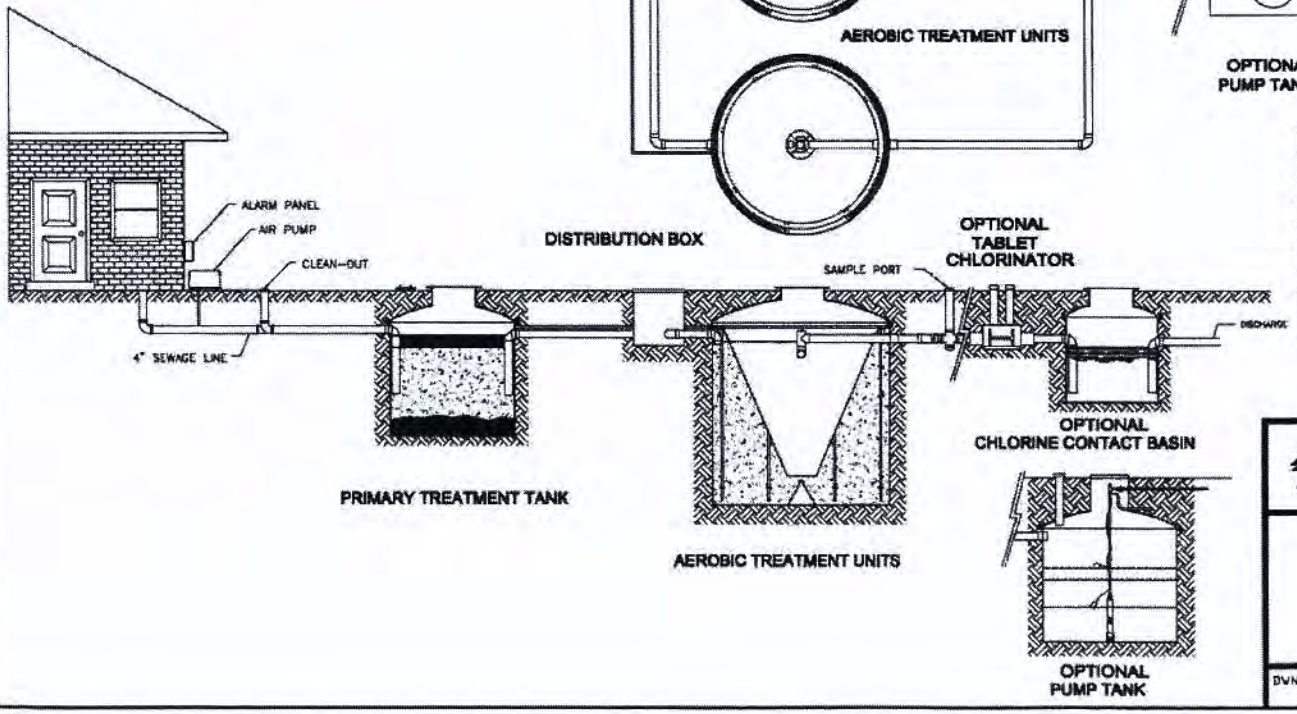
Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727-0969

DELTA MODULAR AEROBIC TREATMENT UNITS WITH FLOW EQUALIZATION TANK MODEL MDF SERIES

DWN BY:	DATE:	SCALE:	DWG. NO:	JOB NO:
	9/3/96	N.T.S.	DFMODULAR3FQ	JOB#







	MDF-200	MDF-300	MDF-450	MDF-600
DESIGN FLOW (GPD)	2,000	3,000	4,500	6,000
AERATION VOLUME (GAL)	2,940	4,454	6,681	8,908
BOD LOADING (LBS/DAY)	5.00	7.50	11.25	15.00
CFM REQUIREMENT	10.42	15.63	23.43	31.25
OPTIONAL EQUIPMENT				
CHLORINATOR	2 TUBE	2 TUBE	2 TUBE	2 TUBE
PRIMARY TREATMENT TANK	1,000-2,000	2,000-3,000	2,000-4,000	4,000-6,000
CLORINE CONTACT BASIN	52 GAL	78 GAL	105 GAL	156 GAL

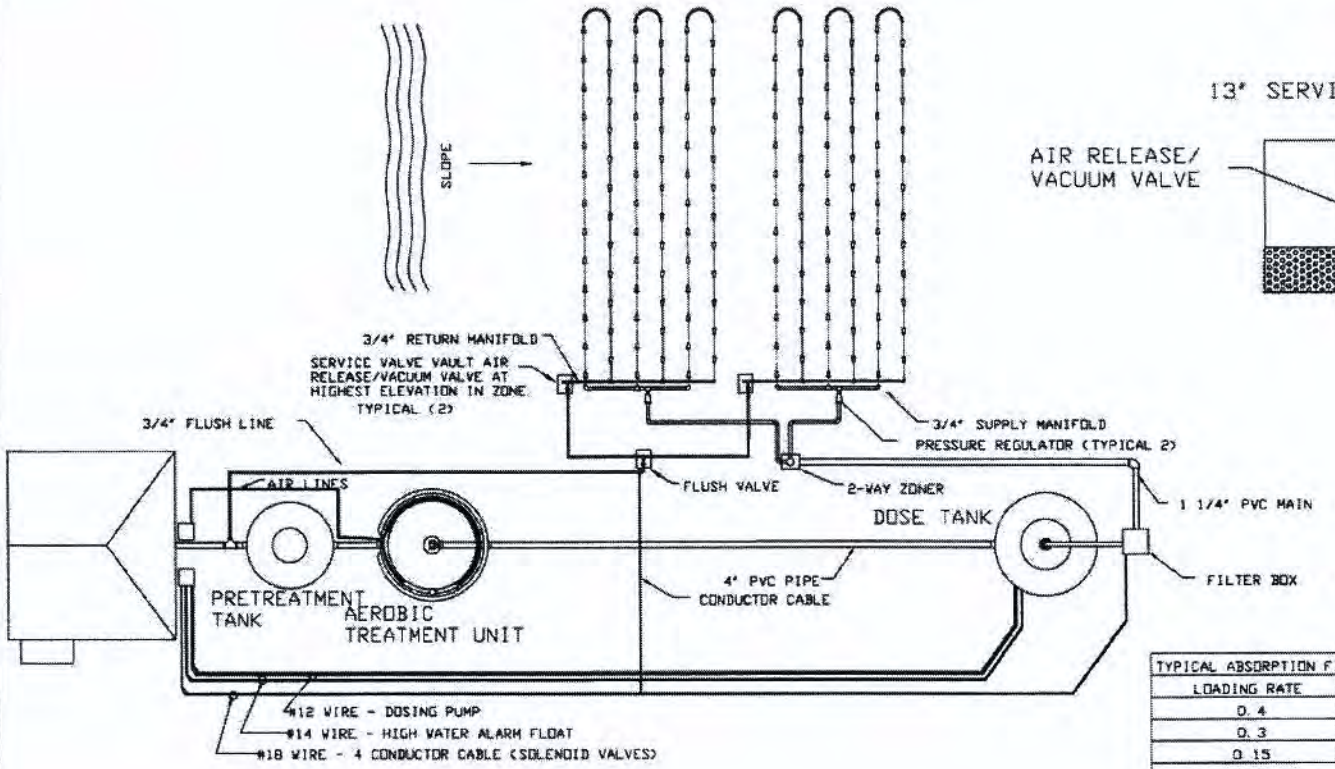
Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727-0969

DELTA MODULAR
AEROBIC TREATMENT UNITS
MODEL MDF SERIES

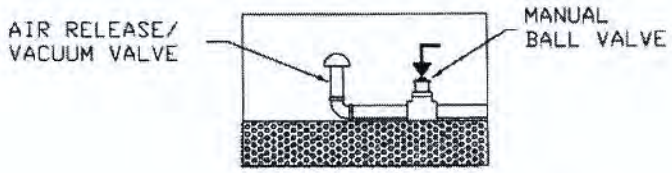
DWN BY:	DATE:	SCALE:	DWG. NO:	JOB NO:
	9/3/96	N.T.S.	DFMODULAR4	JOB#

NOTE: DRIPLINE CONFIGURATION TO BE DETERMINED BY SITE CONSTRAINTS.

MAXIMUM ZONE SIZE: 630 LINEAR FEET
MAXIMUM DRIPLINE PIPE LENGTH: 215'
MAXIMUM NUMBER OF LATERALS: 3
MAXIMUM ELEVATION CHANGE: 8'
NOMINAL NUMBER OF ZONES: 4



13" SERVICE VALVE VAULT



TYPICAL ABSORPTION FIELD REQUIRED PER 100 GALLONS OF WASTEWATER		
LOADING RATE	SQUARE FEET	LINEAR FEET
0.4	250	125
0.3	333	167
0.15	666	333
0.1	1000	500
0.05	2000	1000

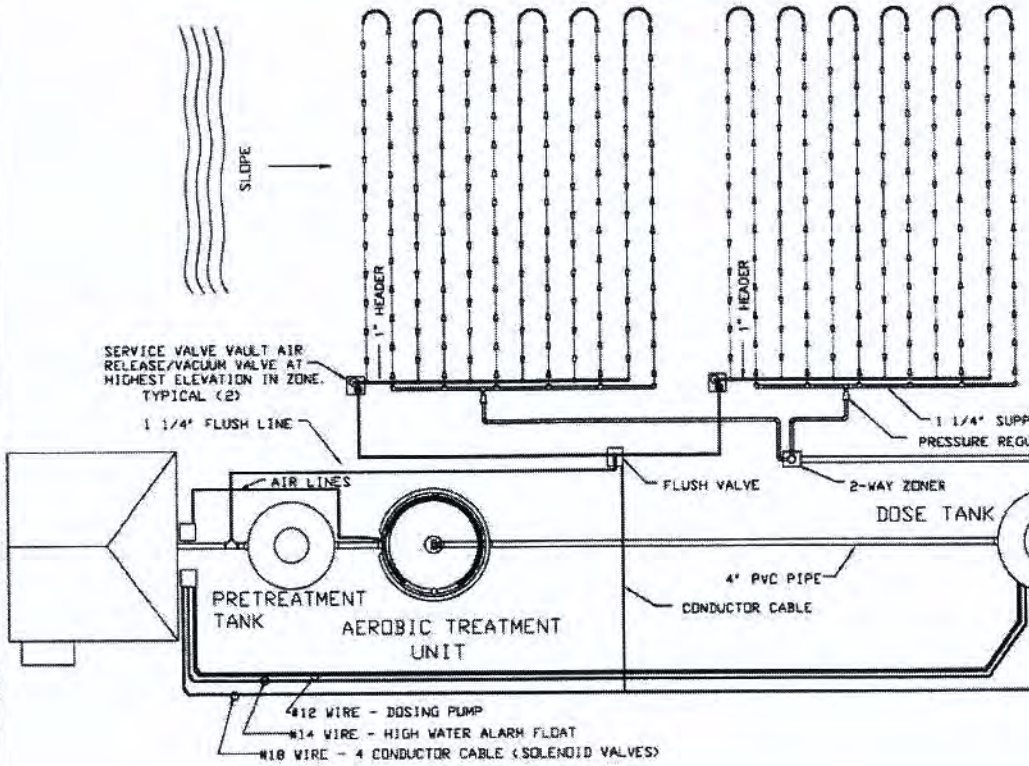
Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727-0969

DWN BY:	DATE:	SCALE:	DWG. NO.:	JOB NO.:
	9/3/96	N.T.S.	Drip115autoA	

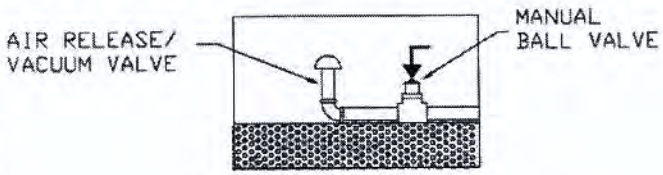
WWFS 1500 AUTOMATIC FILTER SYSTEM
115V SINGLE PUMP 1/2 HP FOR SLOPED PROPERTY

NOTE: DRIPLINE CONFIGURATION TO BE DETERMINED BY SITE CONSTRAINTS.

MAXIMUM ZONE SIZE: 1500 LINEAR FEET
MAXIMUM DRIPLINE PIPE LENGTH: 215'
MAXIMUM NUMBER OF LATERALS: 7
MAXIMUM ELEVATION CHANGE: 8'



13" SERVICE VALVE VAULT



TYPICAL ABSORPTION FIELD REQUIRED PER 100 GALLONS OF WASTEWATER		
LOADING RATE	SQUARE FEET	LINEAR FEET
0.4	250	125
0.3	333	167
0.15	666	333
0.1	1000	500
0.05	2000	1000

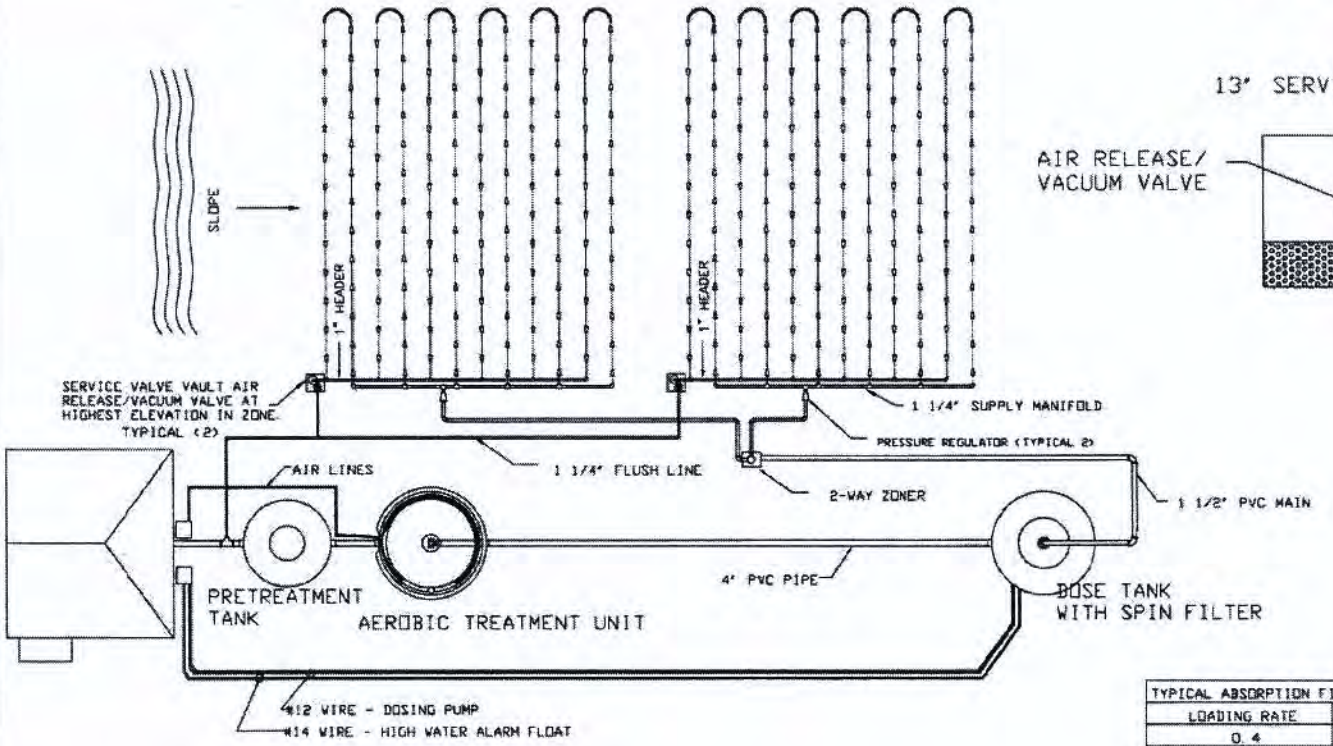
Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727-0969

DWN BY:	DATE:	SCALE:	DWG NO.:	JOB NO.:
	9/3/96	N.T.S.	Drip230autoA	

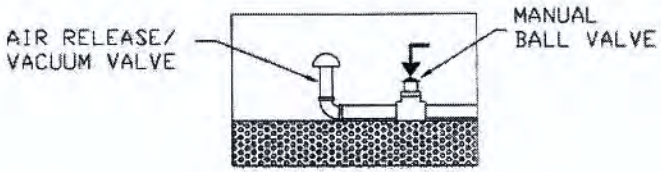
WWFS 3000 AUTOMATIC FILTER SYSTEM
230V SINGLE PUMP 1 HP FOR SLOPED PROPERITY

NOTE: DRIPLINE CONFIGURATION TO BE DETERMINED BY SITE CONSTRAINTS.

MAXIMUM ZONE SIZE: 1500 LINEAR FEET
MAXIMUM DRIPLINE PIPE LENGTH: 215'
MAXIMUM NUMBER OF LATERALS: 7
MAXIMUM ELEVATION CHANGE: 8'



13" SERVICE VALVE VAULT



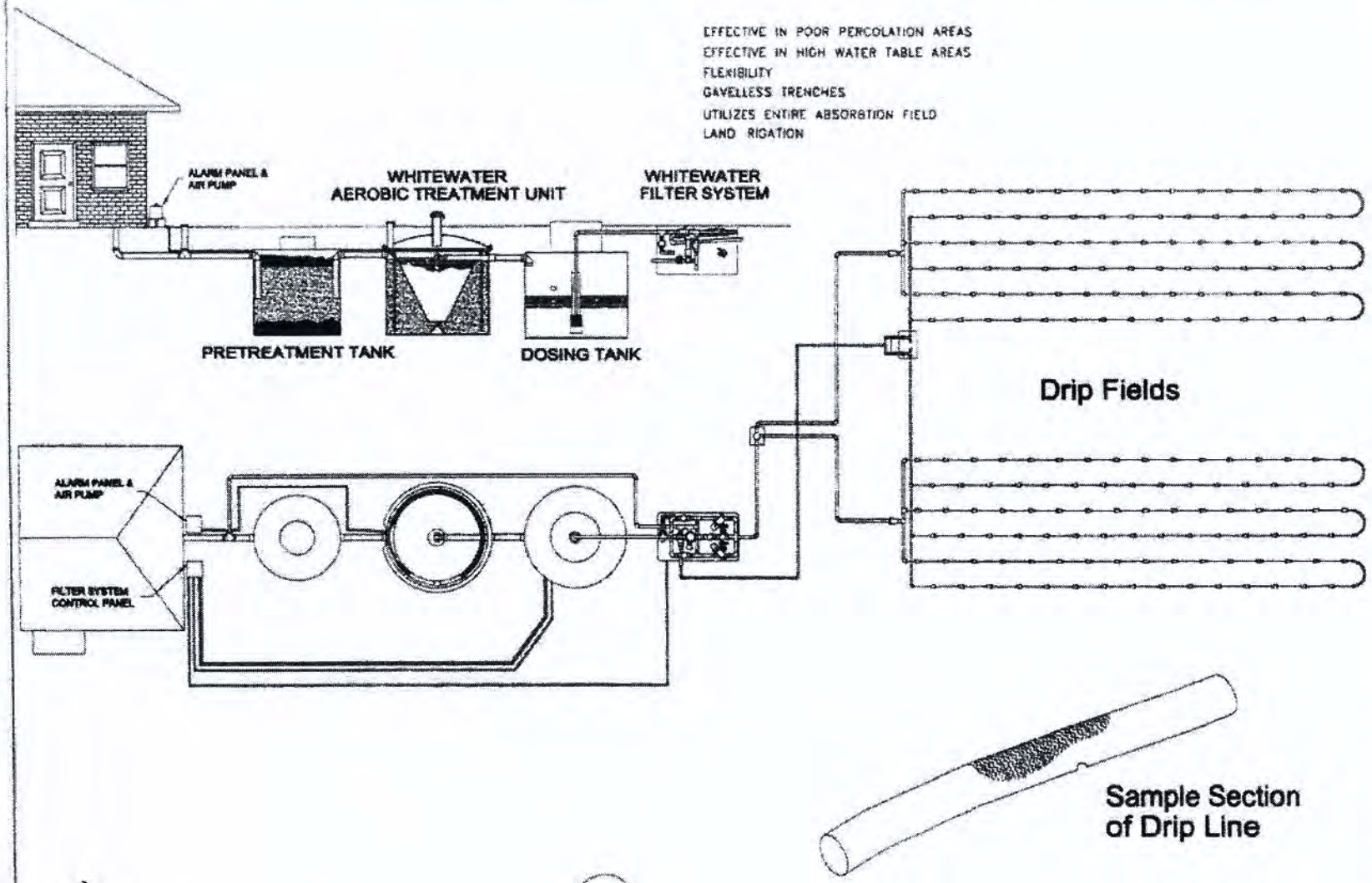
TYPICAL ABSORPTION FIELD REQUIRED PER 100 GALLONS OF WASTEWATER		
LOADING RATE	SQUARE FEET	LINEAR FEET
0.4	250	125
0.3	333	167
0.15	666	333
0.1	1000	500
0.05	2000	1000

Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727-0969

DWN BY:	DATE:	SCALE:	DWG NO.:	JOB NO.:
	9/3/96	N.T.S.	Drip230spinA	

WWFS 3000 WITH SPIN FILTER
230V SINGLE PUMP 1 HP FOR SLOPED PROPERITY

EFFECTIVE IN POOR PERCOLATION AREAS
EFFECTIVE IN HIGH WATER TABLE AREAS
FLEXIBILITY
GAVELLESS TRENCHES
UTILIZES ENTIRE ABSORBTION FIELD
LAND RIGATION



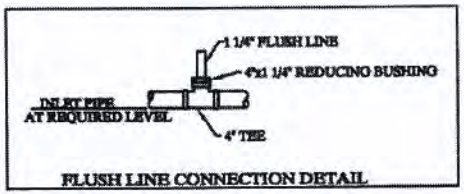
Sample Section of Drip Line

Delta Environmental Products, Inc.
Respected leader in wastewater treatment for 25 years

NSF

1-800-219-9183

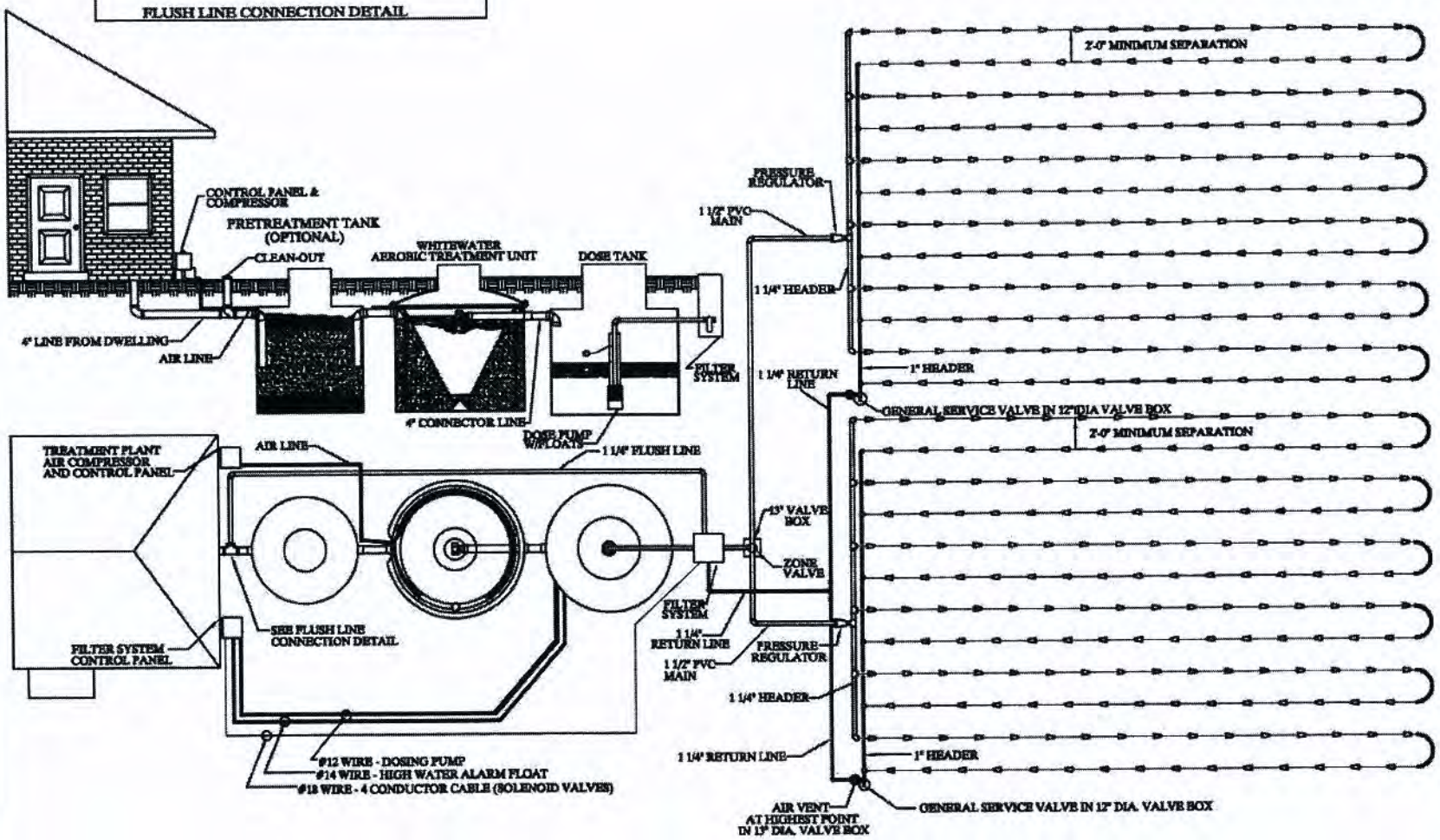
Dr. c. Brochure



FLUSH LINE CONNECTION DETAIL

*ZONE VALVE MUST BE PLACED 12" ABOVE THE DRIP TUBING ELEVATION.
AN AIR RELEASE VALVE MUST BE INSTALLED ON THE PUMP DISCHARGE PIPING INSIDE THE PUMP TANK.

MAXIMUM ZONE SIZE: 1500 LINEAR FEET
MAXIMUM DRIPLINE PIPE LENTGH: 215'
MAXIMUM NUMBER OF LATERALS: 7
MAXIMUM ELEVATION CHANGE: 8'



DELTA ENVIRONMENTAL PRODUCTS, INC.
P. O. BOX 969 DENHAM SPRINGS, LA 70727

TYPICAL SINGLE FAMILY DWELLING INSTALLATION
WWSFA-1HP, TWO (2) ZONE SYSTEM

DWN BY:	DATE:	SCALE:	DWG. NO.:
B.LANDRY	08/06/03	N.T.S.	WWSFA-1 HP

APPENDIX A
SPECIFICATIONS, DIMENSIONS, AND TREATMENT UNIT DRAWINGS

SPECIFICATIONS

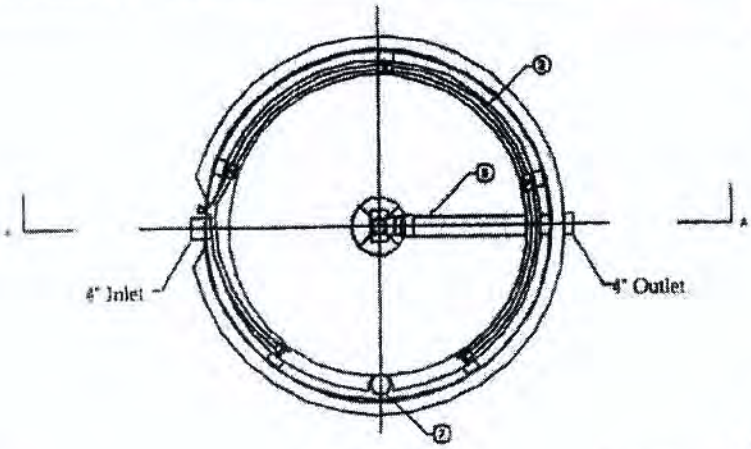
TREATMENT UNIT	TREATMENT CAPACITY L/D	TOTAL VOLUME (GAL)	AERATION VOLUME (GAL)	CLARIFIER VOLUME (GAL)	BOD LOADING (LBS/DAY)	NUMBER OF AIR DROPS
DF50	1,900	909	720	189	1.25	5
DF60	2,300	1147	867	280	1.5	6
DF75	2,900	1438	1100	338	1.88	6
DF100	3,800	1926	1470	456	2.5	8
DF150	5,700	2882	2227	655	3.75	8
DF150X2	10,000	5764	4454	1310	7.5	16

DIMENSIONS

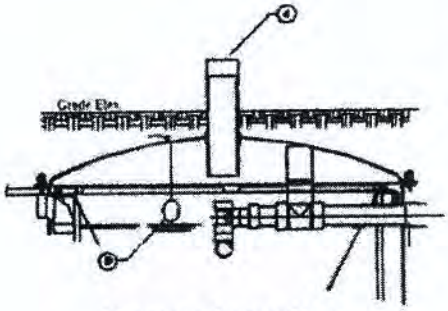
TREATMENT UNIT	A	B	C	D	E	F	G	H
DF50	4'-11 3/16"	4'-8 3/16"	6'-0"	4'-5 9/16"	5'-0"	10"	6'-6"	10"
DF60	5'-7 3/4"	5'-4"	6'-3"	5'-1 1/2"	5'-9"	11 1/2"	6'-9"	10"
DF75	6'-0 1/2"	5'-8 1/2"	6'-9"	5'-6"	6'-2"	11 1/2"	7'-3"	10"
DF100	6'-5 5/8"	6'-2"	7'-6"	5'-11 1/2"	6'-8"	1'-0"	8'-0"	10"
DF150	8'-3 5/8"	8'-0"	8'-0"	7'-9 1/2"	8'-6"	1'-0 3/4"	8'-6"	10"
DF150X2	16'-7 2/8"	8'-0"	8'-0"	7'-9 1/2"	8'-6"	3'-0 ½"	8'-6"	10"

Please refer to the drawing on the following page to see dimensions.

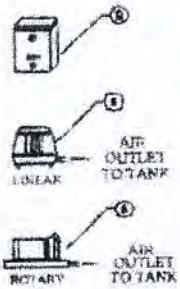
Note: See dimension sheet for number of air drops

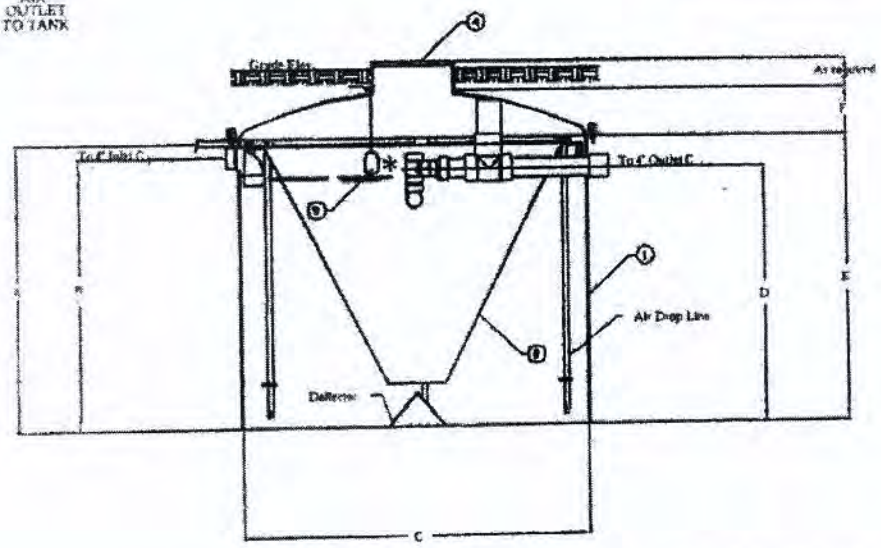


Plan View
(with cover removed)



Alternate Access Port





Section A-A

* HIGH LEVEL FLOAT NOT REQUIRED WHEN USING CP22 SERIES CONTROL PANELS

Delta Environmental Products, Inc.
P.O. Box 969 Denham Springs, LA 70727

WASTEWATER TREATMENT UNITS
MODEL DFXX-FF

DWN BY:	DATE:	SCALE:	DWG. NO.
B.LANDRY	06/19/03	N.T.S.	CRT603

Whitewater® Aerobic Treatment Unit Design and Installation Manual

PARTS LIST:	ITEM	MATERIALS OF CONSTRUCTION
Aeration Tank	1	Fiberglass
Clarifier	2	Fiberglass
Air Distribution System	3	PVC
Access Cover	4	Polyethylene
Discharge Piping Assembly	5	PVC
Air Pump Assembly	6	See Air Pump Parts List
Sample Port	7	PVC
Control Panel	8	NEMA 3R Steel or NEMA 4X Fiberglass
High Water Float Switch	9	Polyethylene

Model	Compressor	Motor full load Amps	Measured Operating Watts	Electrical Requirements
DF50	5060A/5080S/5078S/0323/ QR-0030/EL-80-17 Delta Model 60 Delta Model 80	1.75/2.1/ 2.1/4.0/ 1.8 1.75/2.1	63/85/85/391/ 300/131/63/85 Watts	115 volt -single phase
DF60	5080A/0523/5100S/ QR-50/EL-80-17 Delta Model 80 Delta Model 100	2.1/4.6/ 2.71/5.3/ 1.8/ 2.1/2.71	85/449/110/ 518/131/85/ 110 Watts	115 volt -single phase
DF75	5100S/5120S/QR-50/0523 Delta model 100 Delta Model 120	2.71/2.8/ 5.3/4.6/2.7 1/2.8	110/157/ 518/449/110/1 57 Watts	115 volt -single phase
DF100	(2)5080S/(1)QR-0080/ (2)EL-80-17 (2) Delta Model 80	(2)2.1 (1)10.4 (2)1.8 (2)2.1	(2) 85 Watts (1) 640 Watts (2) 131 Watts (2) 85 Watts	115 volt -single phase
DF150	(3)5100S/(1)QR-0100/ (2)5120S (3) Delta Model 100 (2) Delta Model 120	(3)2.71 (1)10.4 (2)2.8 (3)2.71 (2)2.8	(3) 110 Watts (1) 850 Watts (2) 157 Watts (3) 110 Watts (2) 157 Watts	115 volt -single phase
DF150X2	(2) QR-0100	(1)10.4	(1) 850 Watts	115 volt-single phase X2

DELTA ENVIRONMENTAL PRODUCTS, INC
FIBERGLASS TEST RESULT

TENSILE PROPERTIES
ASTM D 638

SPECIMAN I.D.	WIDTH INCHES	DEPTH INCHES	AREA SQUARE INCH	MAXIMUM LOAD (POUNDS)	TENSILE STRENGTH (PSI)
1	0.748	0.242	0.181	3.580	19,800
2	0.751	0.230	0.173	3.560	20,600
3	0.758	0.273	0.207	4.040	19,500
4	0.752	0.245	0.184	3.980	21,600
5	0.760	0.265	0.201	4.150	20,600
				AVERAGE	20,420
				SRD. DEV.	820

FLEXURAL PROPERTIES
ASTM D 790

SPECIMAN I.D.	WIDTH B	DEPTH D	MAX. LOAD P	FLEXURAL STRENGTH (PSI)	SLOPE M	FLEXURAL MODULOS (PSI)
1	0.511	0.253	177.7	32,600	648	1.25 E + 06
2	0.501	0.275	209.9	33,240	768	1.18 E + 06
3	0.487	0.238	139.2	30,280	468	1.14 E + 06
4	0.508	0.265	185.0	31,110	724	1.23 E + 06
5	0.520	0.243	188.1	36,760	568	1.22 E + 06
			AVERAGE	32,800	AVERAGE	1.20 E + 06
			STD. DEV.	2,506	STD. DEV.	4.39 E + 04

DELTA ENVIRONMENTAL PRODUCTS, INC
FIBERGLASS TEST RESULT (CONT'D)

VOID CONTENT OF REINFORCED RESIN
ASTM D 2734

SPECIMAN I.D.	ASTM D 792 DENSITY	ASTM D 2584 RESIN/GLASS	THEORETICAL DENSITY	CALCULATED VOIDS %
1	1.516	56.3 / 43.7	1.634	7.2
2	1.519	56.0 / 44.0	1.630	6.8
3	1.523	56.0 / 44.0	1.630	6.6
AVERAGE	1.519	56.1 / 44.90	1.631	6.9
STD. DEV.	0.004	0.17	0.002	0.31

APPENDIX B

ELECTRICAL PANELS

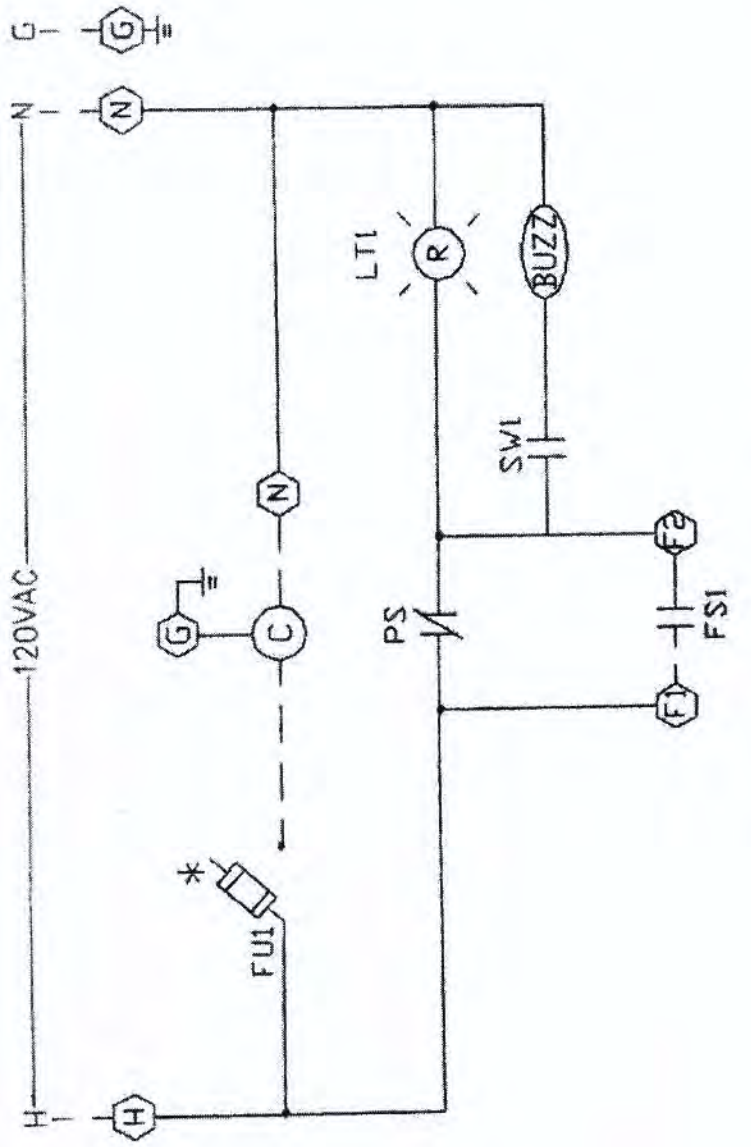
ADDITIONAL MATERIALS NEEDED FOR CONTROL PANEL ELECTRICAL INSTALLATION

QUANTITY	ITEM	MANUFACTURER OR EQUAL
As required	2# 12UF w/ground	
2	300 volt silicon filled underground service wire nuts	King-6T
As required	Conduit and fittings as shown on drawings herein.	
1	20 AMP minimum A/C type disconnect switch or equal. Required on CP20 series panel only.	

DELTA ENVIRONMENTAL PRODUCTS, INC.
P. O. BOX 969 DENHAM SPRINGS, LA 70727

CP20 PANEL

DWN BY:	DATE:	SCALE:	DWG. NO.:
B.LANDRY	04/09/03	N.T.S.	CP20

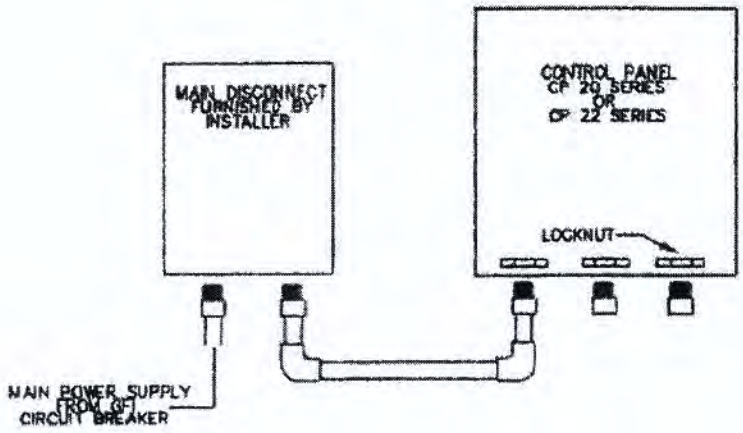


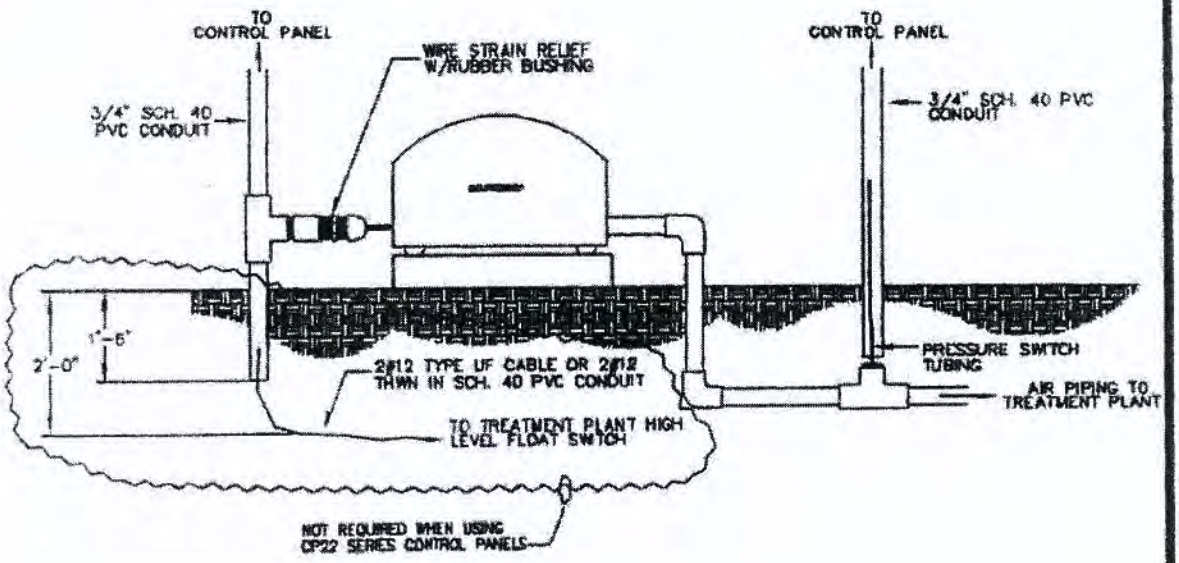
SCHEMATIC DIAGRAM
CP20 SERIES

DELTA ENVIRONMENTAL PRODUCTS, INC.
P. O. BOX 969 DENHAM SPRINGS, LA 70727

CP 20 WIRING DIAGRAM

DWN BY:	DATE:	SCALE:	DWG. NO.:
B.LANDRY	04/09/03	N.T.S.	CP20WD

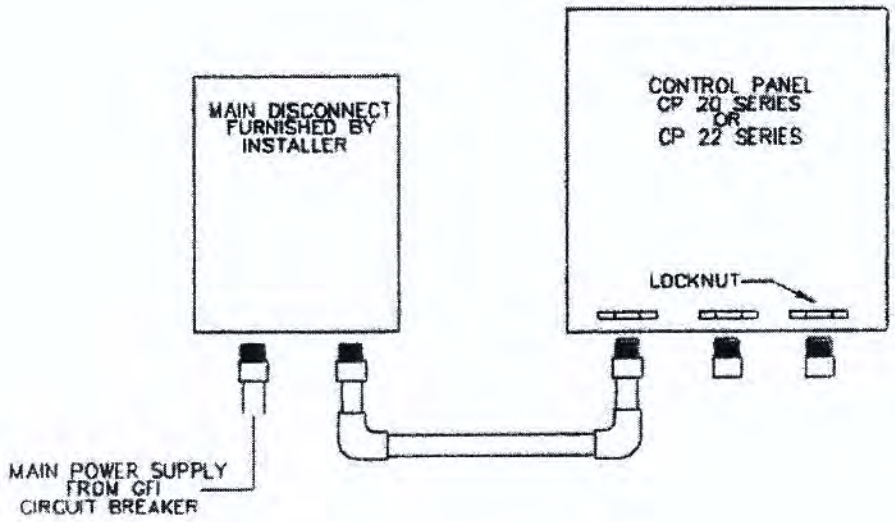


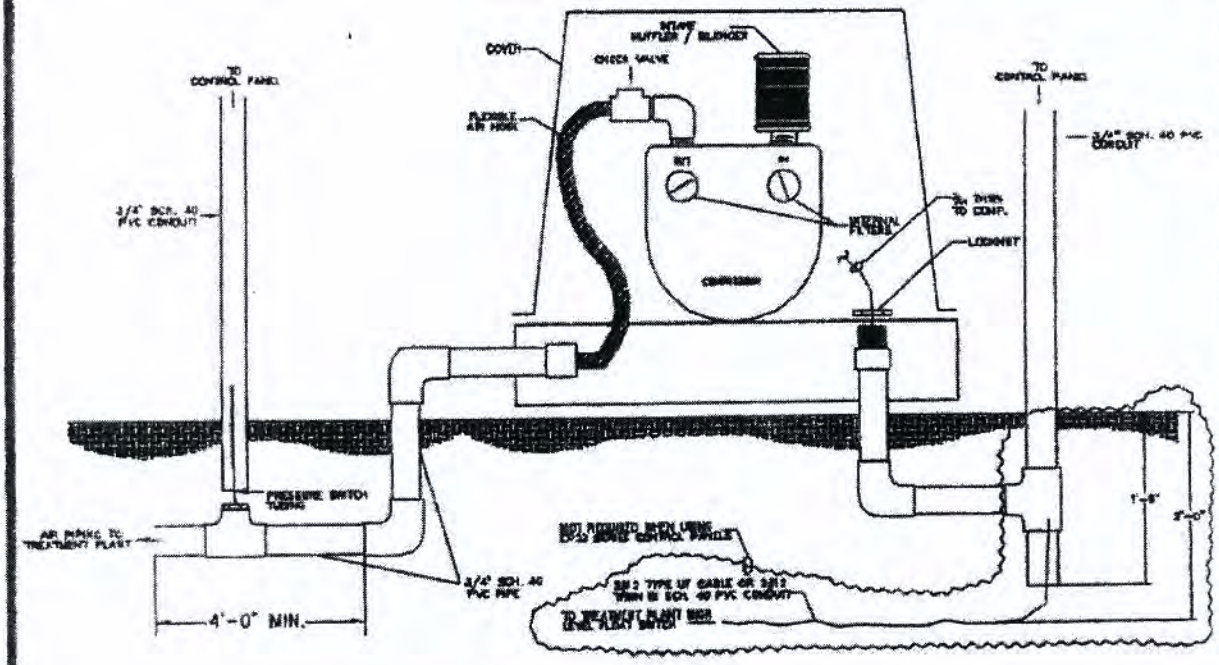


DELTA ENVIRONMENTAL PRODUCTS, INC.
P. O. BOX 969 DENHAM SPRINGS, LA 70727

CONTROL PANEL CONNECTIONS USING LINEAR COMPRESSOR

DWN BY:	DATE:	SCALE:	DWG. NO.:
B.LANDRY	04/09/03	N.T.S.	CRT609

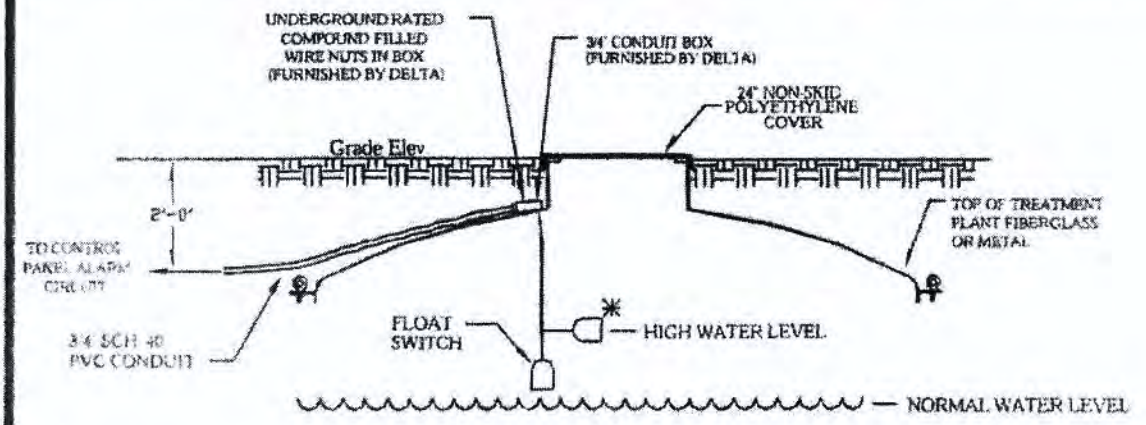


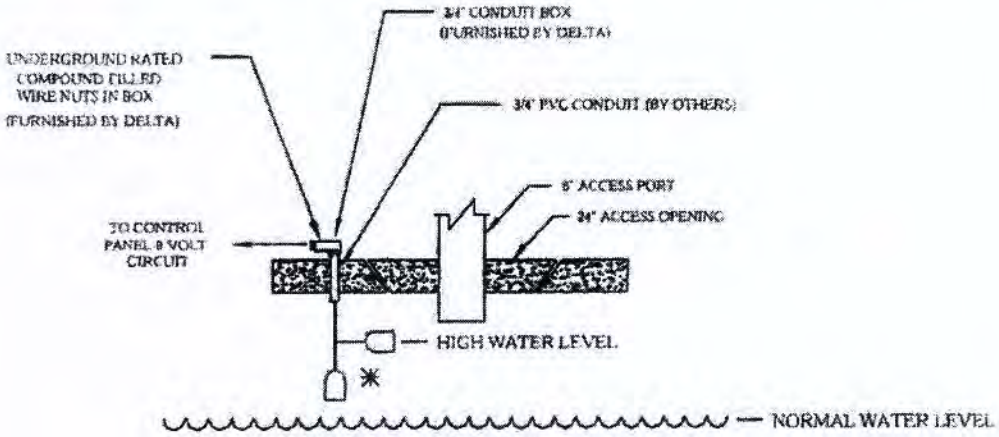


DELTA ENVIRONMENTAL PRODUCTS, INC.
P. O. BOX 969 DENHAM SPRINGS, LA 70727

CONTROL PANEL CONNECTIONS USING ROTARY SERIES COMPRESSORS

DWN BY:	DATE:	SCALE:	DWG. NO.:
B.LANDRY	04/09/03	N.T.S.	CRT610





ENTRANCE INTO CONCRETE TANK

NOTES:

1. GROMMET TO BE SELECTED FOR TIGHT FIT AROUND CABLE AND IN LID
2. WIRE TO CONTROL PANEL TO BE 18 GAUGE AND RATED FOR DIRECT BURIAL SERVICE. WOODS WIRE 886 OR EQUAL.
3. WIRE NUTS TO BE RATED FOR UNDERGROUND SERVICE IDEAL-DB PLUS MODEL 60 OR EQUAL.
4. FLOAT SWITCH TO BE NORMALLY OPEN MDI-AS10Y0500 OR EQUAL.
5. SMALL ACCESS PORT SHOWN ON DRAWING LARGE ACCESS PORTS MAY BE SUPPLIED.
6. MINIMUM AMOUNT OF CONDUIT SHOWN ABOVE IS REQUIRED EVEN WITH TYPE UF CABLE.

* HIGH LEVEL FLOAT NOT REQUIRED WHEN USING CP22 SERIES CONTROL PANELS

DELTA ENVIRONMENTAL PRODUCTS, INC.
P. O. BOX 969 DENHAM SPRINGS, LA 70727

FLOAT SWITCH MOUNTING

DWN BY:	DATE:	SCALE:	DWG. NO.:
B.LANDRY	04/09/03	N.T.S.	CRT611

APPENDIX C
NAMEPLATES

WHITEWATER® AEROBIC TREATMENT UNIT DATA PLATES

4”

WHITEWATER® AEROBIC TREATMENT UNIT

Delta Environmental Products, Inc.
8275 Florida Blvd
Denham Springs, LA 70726
Telephone: 1-800-219-9183

Model DFXX XXXX
ANSI/NSF STD 40
XXXX LPD Class 1

Serial No. XX-XXXXX XX

2”

WHITEWATER® AEROBIC TREATMENT UNIT DATA PLATES

4”

WHITEWATER® AEROBIC TREATMENT UNIT
Delta Environmental Products, Inc.
8275 Florida Blvd
Denham Springs, LA 70726
Telephone: 1-800-219-9183
Model DFXX XXXX
ANSI/NSF STD 40
XXXX LPD Class 1

Serial No. XX-XXXXX XX

3”

APPENDIX D
SERVICE MAINTENANCE AGREEMENTS, WARRANTIES, AND NSF POLICIES

DELTA ENVIRONMENTAL PRODUCTS, INC.
INDIVIDUAL MECHANICAL WASTEWATER® AEROBIC TREATMENT UNIT
SERVICE MAINTENANCE AGREEMENT

INITIAL AGREEMENT:

A two year initial service maintenance agreement shall be furnished to the user by the manufacturer or the distributor through the dealer. This policy is included in the original price and shall provide the following:

1. An inspection/service call every six months, which included inspection, adjustment, and servicing of the mechanical and electrical component parts as necessary to ensure proper function.
2. An effluent quality inspection every six months consisting of a visual check for colour, turbidity, scum overflow, and an examination for odours.
3. A sample shall be pulled from the aeration tank every six months as described in the "SOLIDS REMOVAL" section to determine if there is an excess of solids in the treatment unit. If the test results determine a need for solids removal, the user will bear the cost and responsibility for doing so.
4. If any improper operation is observed which cannot be corrected at that time, the user shall be notified immediately in writing of the conditions and the estimated date of correction.

CONTINUING SERVICE MAINTENACE AGREEMENT:

An annually renewable service maintenance agreement affording the same coverage as the limited Service Maintenance Agreement is available. Consult your dealer for pricing information.

PARTS:

Replacement parts or components may be obtained from your local distributor or directly from Delta Environment Products, Inc.

COMPLAINTS:

In order for Delta Environment Products, Inc. to properly address complaints, we require that you put in writing the date and nature of the complaint as detailed as possible. This must include the Serial Number of your system.

Send to: Delta Environmental Products, Inc.
P.O. Box 969
Denham Springs, LA 70727-0969 USA

LIMITED WARRANTY

Delta Environmental Products, Inc warrants the parts in each treatment unit as follows: air pump: limited pro-rated five (5) years – first two (2) years 100%, third (3) year 75% , fourth (4) year 50%, fifth (5) year 25%; fibreglass tanks: limited ten (10) years, metal tanks: limited two (2) years, and concrete tanks: limited two (2) years. All warranty questions shall be resolved through Delta Environmental Products, Inc. The warranty on the treatment device is that the device is free from defects in material and workmanship from the date of installation treating household wastewater. Some states/provinces do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply. J. Sole obligation under this warranty is as follows: Delta Environmental Products, Inc, shall fulfill this warranty by repairing or exchanging any component part, F.O.B. factory that in Delta Environmental Products, Inc. judgement shows evidence of defects, provided said component part has been paid for and is returned through an authorized dealer, transportation prepaid. The warrantee must also specify the nature or the defect to the manufacturer.

The warranty does not cover treatment process/devices that have been flooded, by external means, or that have been disassembled by unauthorized persons, improperly installed, subjected to external damage or damaged due to altered or improper wiring or overload protection.

This warranty applies only to the treatment process/device and does not include any of the house wiring, plumbing, drainage, or disposal system. Delta Environmental Products, Inc. is not responsible for any delay or damages caused by defective components or material, or for loss incurred because of interruption of service, for any other special or consequential damage of expenses arising from the manufacture, sale, or use of this process/device.

Delta Environmental Products, Inc. reserves the right to revise, change, or modify the construction and design of the treatment process/device for household wastewater or any component part or parts thereof without incurring any obligation to make such changes or modifications in previously sold equipment. Delta Environmental Products, Inc. also reserves the right, in making replacements of component parts under this warranty, to furnish a component part which, in its judgement, is equivalent to the part replaced.

Under no circumstances will Delta Environmental Products, Inc. be responsible to the warrantee for any other direct or consequential damages, including but not limited to, lost profits, lost income, labour charges, delays in production, and/or idle production, which damages are caused by a defect in material and/or workmanship in its parts. Some states/provinces do not allow the exclusion of limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

The warranty is expressly in lieu of any other express or implied warranty, excluding any warranty or merchantability or fitness and of any other obligation on the part of Delta Environmental Products, Inc.

This warranty gives you specific legal rights, and you may have other rights which vary from state to state/province to province.

***The 3, 4, and 5 year pro-rated portion of this warranty is only valid with a continuing Service Policy in effect. Proof of this continuing Service Policy must be provided. ***