AQUA POINT

FOR WASTEWATER ENGINEERS...A PORTFOLIO OF TREATMENT SOLUTIONS & SUPPORT

MUNICIPAL COMMERCIAL RESIDENTIAL

AQUACELL
Moving Bed Biofilm Reactor I (MBBR)

AQUAFAS
Integrated Fixed-Film Activated Sludge I (IFAS)

BIOCLERE^{OH-}
Hybrid MBBR

BIOCLERE
Trickling Filter

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AQUA POINT
ADVANCED WASTEWATER TREATMENT SYSTEMS & SERVICES

39 Tarkiln Place | New Bedford, MA 02745
Tel: (508) 985-9050 | fax: (508) 985-9072
email: info@aquapoint.com

AQUAPOINT
ADVANCED WASTEWATER TREATMENT SYSTEMS & SERVICES

Table of Contents:
MARION CROSS SCHOOL
22 CHURCH STREET, NORWICH, VT 05055
NOVEMBER 2022

Personnel involved on Marion Cross School, Norwich, VT:

Joe Pinto - (Project Manager)

Josh Lindell - (Engineer)

Mike Hollenberger - (Field Technician)

Services provided by the company:

COMPREHENSIVE SUPPORT FROM PROPOSAL THROUGH INSTALLATION

We support you from design through installation to ensure the project is done right. Equipped with criteria on your unique needs, our engineers craft a comprehensive design package. This includes a recommended solution based on your influent characteristics and regulatory requirements, extensive performance verification, modeling with CAD drawings and detailed explanations, and preliminary budgets that include operational and lifecycle cost projections. We assist you with the formal permit applications and provide the contractor with very detailed installation instructions. Further, you can get an onsite technician to monitor the installation.

Design Support… AutoCAD drawings, specifications, and plan review

Permitting assistance

Onsite consultations for installation and startup

Operator training

Aftermarket parts and technical support

SCHOOLS AND AQUAPOINT

School waste streams can represent challenging conditions for biological treatment processes. School sanitary routines and irregular schedules increase the potential for toxic shock and peak hydraulic loading. Furthermore, ammonia nitrogen concentrations in the influent are typically 4-5 times that of typical domestic wastewater. That's why over 70 school districts have turned to AquaPoint for a long-term and cost-effective solution. We design all our products using fixed film technologies which allow the microbes breaking down the waste to naturally fluctuate depending on the pollutant load. With proven nitrification and denitrification performance capability, energy efficiency, and low life-cycle costs, our systems can handle any institution from local daycares to state universities.

Compact Systems Expertly Designed

Whether you're in the middle of the city or out in the countryside, AquaPoint will design and engineer your wastewater treatment solution to your exact specifications. This creates a “plug and play” installation which is quicker and easier to install.

Support and Expertise from Proposal to Beyond

AquaPoint’s wide-ranging team of engineers, designers, and wastewater plant operators are all prepared to assist you every step of the way. We work with you through the entire concept to completion lifecycle, starting from the beginning design phases, through the permitting process and even after the final installation.

High Strength Waste Removal

AquaPoint's systems are designed to be cost-effective and highly efficient at high strength removal throughout the year. The fixed film used in all of our products keeps the microbes warm during cold months and allows their population to increase or decrease depending on pollutant load so our systems work year-round with minimal maintenance. After installation, schools and universities typically see a reduction in BOD and TSS greater than 95%.

Quality Materials Made to Last

AquaPoint’s solutions use fiberglass as the primary fabrication material, resulting in 50 years of life with virtually no maintenance and reduced lifecycle costs. Furthermore, our technologies have been independently validated and received a 100% approval record from the EPA, ETV, NSF/ANSI 40, USGBC, NASA, and the US Navy.

References:

Paul Weber: 614-581-5667 or paulweber45@gmail.com – Owner of Hyde Away Inn. 1428 Mill Brook Rd, Waitsfield, VT 05673. (6,000 gpd high strength application for Inn with restaurant).

Nate Fredericks: 802-793-5633 or fredericksnathaniel@gmail.com – Operator of a handful of Bioclere systems in the Waitsfield, VT area including: Lawsons Finest Liquids, 155 Carroll Rd. Waitsfield, VT 05673. (6,500 gpd high strength) and Waitsfield Industrial Park 48 Carroll Rd, Waitsfield, VT 05673. (9,000 gpd high strength)

Lawsons quick link video: https://www.youtube.com/watch?v=UNDjXmmbTu4

Bruce Strong: 781-820-5386 – Operator of roughly 10 Bioclere systems in Northeastern MA and has over 20 years' experience with the product and AquaPoint.

Bioclere Highlights:

Performance of fixed film systems at small percentages of design flow.

Bioclere's ability to handle very low flow rates is due to its biological process. The Bioclere utilizes a fixed film process which, by nature is "self-regulating" meaning that it automatically adjusts to varying flows and organic/inorganic loads. Heavy pollutant (organic and/or nutrient) loads cause the biomass to grow faster and slough more rapidly providing additional uptake. Conversely, loads lighter than maximum design capacity result in a thinner biomass over the available media. In lighter loading conditions, bio-solids do not slough as rapidly thus maintaining the population of treatment bacteria. Infrequent sloughing results in a longer Solids Retention Time (SRT) and a more complex, diversified, and stable bacterial population. The mechanical design of the Bioclere also allows adjustment of the filter dosing and recycle rates to sustain a biomass even during periods of no or limited flow such as with seasonal applications. Less flow will also result in longer Hydraulic Retention Time (HRT) resulting in more passes (via recirculation) through the treatment reactor and more time in the clarifier which provides greater solids settling efficiency and improved performance.

Fats, oils, and grease

The treatment of fat, oil, and grease (FOG) can be problematic for some trickling filter technologies on the market largely because the media materials and sizes are prone to clogging and ponding. However, FOG reduction is extremely efficient in a Bioclere treatment system. At Aquapoint we use a variety of media sizes so that we can choose the size and surface area that will best suit the application. Bioclere systems treating high strength waste with high FOG concentrations usually incorporate a two-stage series design, where the first Bioclere is used as a roughing filter (large media, large air volume, small surface area) and the second Bioclere is used for polishing (small media, small air volume, large surface area). This prevents clogging of the filter and all the resulting odor, treatment, and maintenance issues.

A grease trap will consistently reduce FOG concentrations to <100 mg/l if properly installed and maintained. Maintenance will only require periodic inspections and cleaning of the trap. Aquapoint recommends that the maintenance of the grease trap be included in the scope of services to be provided by the operator of the wastewater treatment plant.

Odor Generation

AquaPoint's Bioclere system utilizes a fully aerobic fixed film attached growth treatment process based on a modified trickling filter technology. The design of the system includes air volume within the media filter, hydraulic loading rates, hydraulic retention times and recycle rates all of which contribute to sustained aerobic conditions for oxidation of organic matter.

Because the Bioclere unit is a covered and insulated trickling filter, an axial fan is used to draw air into the media bed, supplying the biofilm with oxygen by forced draft ventilation. This method is a simple, reliable, and cost effective. Air flows subsequently through the filter and under drain and is discharged through a vent in the effluent pipe. Alternating dosing pumps are incorporated to ensure consistent dosing of the media bed and no interruption of the aerobic process should a pump fail.

AQUAPOINT

To: Jamie Teague
Fr: Joe Pinto, AquaPoint
Re: Marion Cross School, Norwich VT
Date: Tuesday, November 1, 2022

Thank you for the opportunity to provide a preliminary budget proposal for the referenced project. We understand that the project involves treatment of sanitary wastewater from a School that will be predominantly used on weekdays. AquaPoint has also taken into consideration the addition of waste from an on-site kitchen to be added later. The treatment goal is to reduce the organic (BOD), suspended solids (TSS) to secondary treatment standards prior to discharge to a disposal system by others.

Design Notes & Assumptions

Preliminary design information:

(1) Estimated Design Flow = 5,500 gpd.
(2) Peaking factor = 4.0 / 2.0 with flow equalization
(3) Collection system: Gravity/ Force Main
(4) Predominantly weekday occupancy
(5) Influent Characteristics are ASSUMED and ESTIMATED based on preliminary description of the facilities. Flow and strength characteristics are to be confirmed prior to final design.

	pH	Temp	BOD (mg/l)	TSS (mg/l)	TKN (mg/l)	NH3 (mg/l)	TN (mg/l)	Alkalinity
Settled Influent	6 – 9	10°C – 25°C	400	400	100	n/a	n/a	Assumed sufficient
Effluent	6 – 9		30	30		n/a	n/a	

System Description

Sludge return & recycle

Primary settling → Flow equalization → Dual Stage Bioclere → Tablet Chlorinator → Discharge

Flow from the primary settling tanks is settled and then equalized. The contents of the flow equalization tank are transferred at a controlled rate to a dual stage Bioclere modified trickling filter

with integral clarifiers. The system will recycle nitrified effluent to the primary settling tanks where anoxic conditions in the tanks facilitate denitrification and reduce total nitrogen to the indicated effluent quality. Secondary solids from the Biocleres filters are returned and stored in the primary tank until periodically removed from the site. The system shall oxidize organic Biochemical Oxygen Demand (BOD) load and Total Suspended Solids (TSS) to secondary treatment standards prior to discharge to the effluent distribution system by others. To note a direct bury tablet chlorinator will be installed after the second Bioclere to aid in achieving "Swimming Water Quality" effluent.

Supplied Equipment

- Two (2) Barnes SE421 Pumps (Duplex Equalization Pump System)
- Complete with, pump carriers w/ breakaway fitting, SS lifting chains, floats, weights, bracket, and controls.
- Two (2) Bioclere Model 24/20-1600 units complete with FRP tank, media, duplex media dosing pumps, recycle pump, aeration fan and PLR controls.
- Norweco Bio-Dynamic 400 tablet chlorinator with riser
- Two (2) site visits by factory technician for on-site technical assistance with installation and start up.
- (1) Engineering, Warranty & Technical Manual.

Preliminary Budget Estimate

Process Equipment & Services/ travel & site visits…….. $ 102,186
Estimated Freight FOB Norwich VT ……. $ 3,000

Schematic diagram

The attached diagram is for purposes of illustration only and does not represent the actual scale or layout of the tanks and equipment. Dimensional drawings of the proposed tanks and the Bioclere Model 24/20-1600 are attached.

Recommendations with existing Tanks & Equipment

Use total of 9,000 gallons of existing primary settling tank capacity

- Convert the first existing 4,000-gallon field dosing tank to a flow equalization tank (this will be used to pump up to the Bioclere)

- Leave other existing 4,000-gallon field dosing tank as currently constituted to dose to drain field.

Equipment by others

One (1) 1,500 gal. in ground grease trap to code, for food prep area.

Installation

Only those items indicated above are included. Labor is not included. All other items will be supplied by others such as but not limited to excavation, offloading, bedding, and footings, setting of tanks, electric service to control panels, collection & disposal system, finish grading, mounting, and wiring pre-wired components, field piping, backfill, water to fill tanks. Installations in ground water conditions may require watertight treatment and / or anti-floatation ballast backfill as necessary.

Additional Considerations & Review

This estimate reflects the design parameters as indicated above and assumes no other environmental factors that will adversely affect treatment. Toxic products inhibit or kill bacteria necessary for treatment and must not be discharged to the wastewater system.

This proposal represents our best efforts to be as complete and accurate as possible. Due to assumptions made in the interest of generating a timely estimate it is provided for budget purposes only and cannot be used to purchase system equipment. After clarification of all necessary information including final approved plans and permit(s), a firm equipment scope and bid price will be provided. We are available to discuss this proposal to devise a system that meets your needs.

In providing this estimate Aquapoint has relied exclusively on information provided by the addressee and on the assumptions stated herein. The addressee acknowledges and affirms that Aquapoint assumes no liability with respect to the addressee or any third party for the estimates.

Freight & Delivery

Pricing is FOB factory and does not include applicable taxes. Freight charges are estimated and will be confirmed at the time of bid. Delivery is within 8 -10 weeks of receipt of an order with deposit.

Equipment Warranty

Supplied equipment is warranted against defects in materials and workmanship for one year from the date of installation or 18 months from the date of delivery.

Thank you for your consideration. Please contact me with any questions or comments.

Joe Pinto
Aquapoint
Jpinto@aquapoint.com
508 951 4624

PROFILE (N.T.S)
CUT AND CAP BOTTOM CONNECTION BETWEEN EXISTING FIELD DOSING TANKSSO THEY CAN OPERATE INDEPENTLY AS EQ AND FIELD DOSING
BED SECTION (N.T.S)
Dosing Chambers
Septic Tank Detail (N.T.S)
Asphalt Court
EXISTING SCHOOL
PROPOSED ADDITION
INSTALL NEW 2" BIOCLERE RECYCLE LINE BACK TO HEAD OF FIRST EXISTING PRIMARY TANK.
CONVERT FIRST EXISTING 5,000 GAL FIELD DOSING TANK TO FLOW EQUALIZATION TANK. INSTALL NEW SUBMERSIBLE PUMPS, FLOATS AND CONTROLS. 2" PLUMBING TO FIRST BIOCLERE
DIRECT BURY TABLET CHLORINATOR
6" PVC PLUMBING BETWEEN BIOCLERES, CHLORINATOR AND EXISTING FIELD DOSING TANK
BIOCLERE UNITS 1 & 2 ARRANGED IN SERIES. TANKS COULD BE INSTALLED NORTH OF EXISTING DOSING TANKS IF DESIRED.
Proposed Gravel Drive
U.S. Rt. 5
Typical Trench Section (N.T.S)
DESIGN DATA
Septic Tanks:
PB-3-0867
OFFICE COPY
SEWAGE DISPOSAL SYSTEM DESIGN
MARION CROSS SCHOOL
NORWICH, VERMONT
SCALE 1":20'
APRIL 21, 1988
Revised 6/10/88
Revised 6/26/88
Revised 6/30/88
K.A. LECLAIR ASSOC., INC.
CIVIL ENGINEERS
HANOVER,N.H.
PROJECT NO. 112987A

WASTEWATER SYSTEM AND POTABLE WATER SUPPLY INNOVATIVE AND ALTERNATIVE (I/A) TECHNOLOGY PILOT USE APPROVAL PERMIT

LAWS/REGULATIONS INVOLVED

10 V.S.A. Chapter 64, Potable Water Supply and Wastewater System Permit
Wastewater System and Potable Water Supply Rules, Effective April 12, 2019

Permittee: Aquapoint.3 LLC
39 Tarkiln Place
New Bedford, MA 02745
(508) 985-9050
www.aquapoint.com

Permit Number: **P-2003-02-R06**
Date Issued: **12/02/2021**
Date Expires: **05/01/2023**

This permit is for the following recirculating fixed-film trickling filter I/A technology models:

Product Name	Model Number(s)	Design Flow (gpd)
Bioclere	16/12SS	500 – 2500 gpd, unit additionally sized on wastewater strength
Bioclere	16/12LS	500 – 2500 gpd, unit additionally sized on wastewater strength
Bioclere	16/15	500 – 2500 gpd, unit additionally sized on wastewater strength
Bioclere	16/19	500 – 2500 gpd, unit additionally sized on wastewater strength
Bioclere	16/22	500 – 2500 gpd, unit additionally sized on wastewater strength
Bioclere	16/25	500 – 2500 gpd, unit additionally sized on wastewater strength
Bioclere	24/12-950	2500 – 9000 gpd, unit additionally sized on wastewater strength
Bioclere	24/12-1600	2500 – 9000 gpd, unit additionally sized on wastewater strength
Bioclere	24/20-950	2500 – 9000 gpd, unit additionally sized on wastewater strength
Bioclere	24/20-1600	2500 – 9000 gpd, unit additionally sized on wastewater strength
Bioclere	24/24-950	2500 – 9000 gpd, unit additionally sized on wastewater strength
Bioclere	24/24-1600	2500 – 9000 gpd, unit additionally sized on wastewater strength
Bioclere	24/30-950	2500 – 9000 gpd, unit additionally sized on wastewater strength
Bioclere	24/30-1600	2500 – 9000 gpd, unit additionally sized on wastewater strength
Bioclere	30/12	5000 – 13500 gpd, unit additionally sized on wastewater strength
Bioclere	30/24	5000 – 13500 gpd, unit additionally sized on wastewater strength
Bioclere	30/32	5000 – 13500 gpd, unit additionally sized on wastewater strength
Bioclere	36/24	15000 – 20000 gpd, unit additionally sized on wastewater strength *flows in excess of 6500 gpd typically discharge to an indirect system
Bioclere	36/30	15000 – 20000 gpd, unit additionally sized on wastewater strength *flows in excess of 6500 gpd typically discharge to an indirect system

The technologies listed in this permit are used to treat **high strength** effluent to discharge to a soil-based wastewater disposal system. The technologies, consisting of a recirculating fixed-film trickling aerobic filter for treatment of high strength wastewater to low strength, are hereby approved under the requirements of the regulations named above subject to the following conditions.

1. GENERAL

1.1 The technologies listed in this permit may be used as part of a soil-based wastewater system permitted under the Rules provided the conditions of this permit are met.

1.2 Failure by the Permittee to comply with these conditions is grounds for the Secretary to revoke or not renew the Approval Permit.

1.3 The approval shall expire on **May 1, 2023.** Applications for renewal of this Approval Permit shall be submitted to the Division by March 1, 2023, to avoid a lapse in approval. The renewal request shall be submitted on a form prepared by the Secretary and shall include: a description of any changes to the equipment, technical specifications and drawings, installation requirements, and operation and maintenance manuals.

1.4 No changes shall be made to the approved technology without prior review and approval by the Secretary.

1.5 This Approval Permit is based on the design, operation, and maintenance manuals submitted by the Permittee to the Secretary. Misrepresentation in the application material is grounds for the Secretary to revoke this permit.

1.6 If the Rules are revised during the term of this Approval Permit, this permit shall be revised as needed to conform to the revisions.

1.7 Site-specific permission for the use of this technology is required in the form of a Wastewater System and Potable Water Supply Permit (WW Permit).

1.8 This permit is not a representation or guarantee of the effectiveness, efficiency, or operation of the approved technology.

1.9 This Pilot Use Approval Permit is granted for the treatment of septic tank effluent that is characterized as high strength according to §1-805(b) of the Rules.

1.10 This Pilot Use Approval Permit is limited to 25 installations of the technology in the State of Vermont as per §1-403(c) of the Rules.

1.11 This approval is based on information submitted by the Permittee indicating that the technology will treat the effluent to reduce the biochemical oxygen demand (BOD_5) to 300 mg/L or less, total suspended solids (TSS) to 150 mg/L or less, and fats, oil, and grease (FOG) to 50 mg/L or less.

1.12 Each Vermont landowner in interest shall be shown a copy of the Wastewater System and Potable Water Supply Innovative and Alternative System Pilot Use Approval Permit, the Operation and Maintenance manuals, and projected maintenance costs prior to the installation of any permitted unit.

1.13 All components of the technology shall be warranted for the first 2 years following commencement of use of technology unit. The permittee shall have an inventory of replacement parts available locally or available for delivery within 24 hours.

1.14 All conditions set forth in WW Permits that include the use of the approved technology shall remain in effect and may surpass the conditions set herein.

1.15 A WW Permit that approves the use of a technology approved by this permit remains valid for the use of the technology identified in the WW Permit even if this permit expires.

2. DOCUMENTS

2.1 The approval of the I/A technology is based on the following documents submitted by the permittee:

Title	Submission Date	Revision
Influent and Effluent Data Sets for Various Installations	11/23/2021	None
Environmental Technology Verification Joint Verification Statement	10/05/2021	None
Bioclere Design Considerations	10/05/2021	None
MA DEP Certification for General Use	10/05/2021	None
RI DEM Alternative/Experimental OWTS Technology Program Certification	10/05/2021	None
VT-ANR Innovative and Alternative Technology Approval Application	10/05/2021	None

2.2 Use of the I/A technology in ways not depicted or described in the documents, and or identified in this permit, is not allowed without prior approval by the Drinking Water and Groundwater Protection Division.

3. SERVICE PROVIDER

3.1 The Permittee shall contract with and maintain a minimum of two Service Providers for the State of Vermont (Vermont Service Provider) to perform the inspections, maintenance, and repairs required by this permit and by conditions of the WW Permit. The Vermont Service Providers must be based in Vermont or in a neighboring state or province and be ready and willing to provide service to the technologies in Vermont.

3.2 The Permittee shall provide to the Secretary the names, mailing addresses, email addresses, and phone numbers of two or more service providers prior to the Division issuing a WW Permit for use of the technology.

3.3 The Permittee shall maintain with the Secretary the names and contact information for all Vermont Service Providers. The Permittee shall notify the Secretary within 30 days of termination of an existing and/or hiring of a new Service Provider. Failure to maintain a minimum of two Vermont Service Providers will result in the Secretary prohibiting the issuance of a WW Permit with the approved technology.

3.4 The Permittee shall provide training to each Vermont Service Provider for the proper operation, maintenance, and repair of each approved technology.

3.5 Service Providers must follow Permittee and WW Permit conditions for inspection, maintenance, and reporting requirements.

3.6 Maintenance and inspections of the approved technology must be performed by a Service Provider trained and authorized by the Permittee. Reports shall be provided to the Permittee, landowner, and Division in a timely manner so that they can ensure conditions of the WW Permits are met.

3.7 Maintenance and inspections performed by Service Providers shall be in accordance with the operation and maintenance manual submitted as part of the I/A permit approval application, as provided in trainings by the Permittee, and specified in the WW Permits issued by this Division.

4. REPORTS

4.1 The Permittee shall submit electronically by April 1st of each year an annual report to the Division containing the following information for the previous 12-month period ending December 31st:

A. the entities who are distributing the permitted technology in the State of Vermont

B. a listing of each permitted technology installed in Vermont during the previous calendar year with the following information:
   i. assigned WW Permit number;
   ii. the property's SPAN number;
   iii. the distributor who sold the installed technology
   iv. the name of the Vermont-licensed Designer providing the installation certification;
   v. the name of the contracted and authorized Service Provider inspecting the technology at the time of installation;
   vi. the date installed, and;
   vii. the date of initial use of the technology (beginning of 2-year warrantee period).

4.2 The Permittee shall ensure the Vermont Service Providers for each of the permitted systems utilizing this technology installed in Vermont are submitting to the Division the following reports;

A. an initial report of an inspection conducted within 15 days of initial usage;

B. inspection reports of the I/A technology conducted every month for the first 6 months of usage;

C. inspection reports of the I/A technology conducted biannually following the initial 6 months of usage.

4.3 Maintenance and inspections reports shall be submitted on the Secretary-approved inspection report form and be signed and dated by the Service Provider.

4.4 Inspection reports by the Service Provider shall include but not be limited to a summary of lab analyzes of influent and effluent quality, water metering data, all known problems, damages, and/or failures of the technology to comply with this approval and operating requirements for the technology, including:

A. a description of any problems, damages, and/or failures;

B. potential/known causes of any problems, damages, and/or failures;

C. a statement of system operability including whether or not the technology is operating in compliance with this approval and operating specifications following repairs or corrections of any problems, damages, and/or failures;

D. a listing of the required repair/remediation;

E. identification of changes to the technology specifications; and

F. any observed failure of the wastewater system including wastewater exposed to the open air, wastewater pooling on the surface of the ground, wastewater discharging directly to surface water, or wastewater backing up into the building or structure.

4.4 Problems, damages, and/or failures of the technology identified during an inspection per condition 4.3 of this permit must be reported by the service provider immediately to the landowner and within 15 days to the Division.

4.5 Maintenance and inspections shall be performed in accordance with the permitted operation and maintenance manual that are specified in the WW Permits issued by this Division.

5. DESIGN SPECIFICATIONS

5.1 The design of a wastewater system using the approved technology shall identify the specific approved -model and shall not be replaced with any other model without an amendment to the WW Permit.

5.1 Technologies shall be equipped with anti-flotation devices. The Permittee may specify whether or not the anti-flotation devise are required if a designer demonstrates flotation will not occur or the designer proposes in an application for the use of the technology an alternative method to stabilize the technology that complies with the Permittee's requirements for installation.

5.3 Technology model choice and sizing shall be in accord with the Permittee's technical requirements approved by the Secretary. Sizing of each unit shall be based on the calculated design flow per §1-803 of the Rules and the characteristics of the wastewater to be treated.

6. INSTALLATION SPECIFICATIONS

6.1 The approved technology shall be installed under the guidance of a Service Provider and a designer.

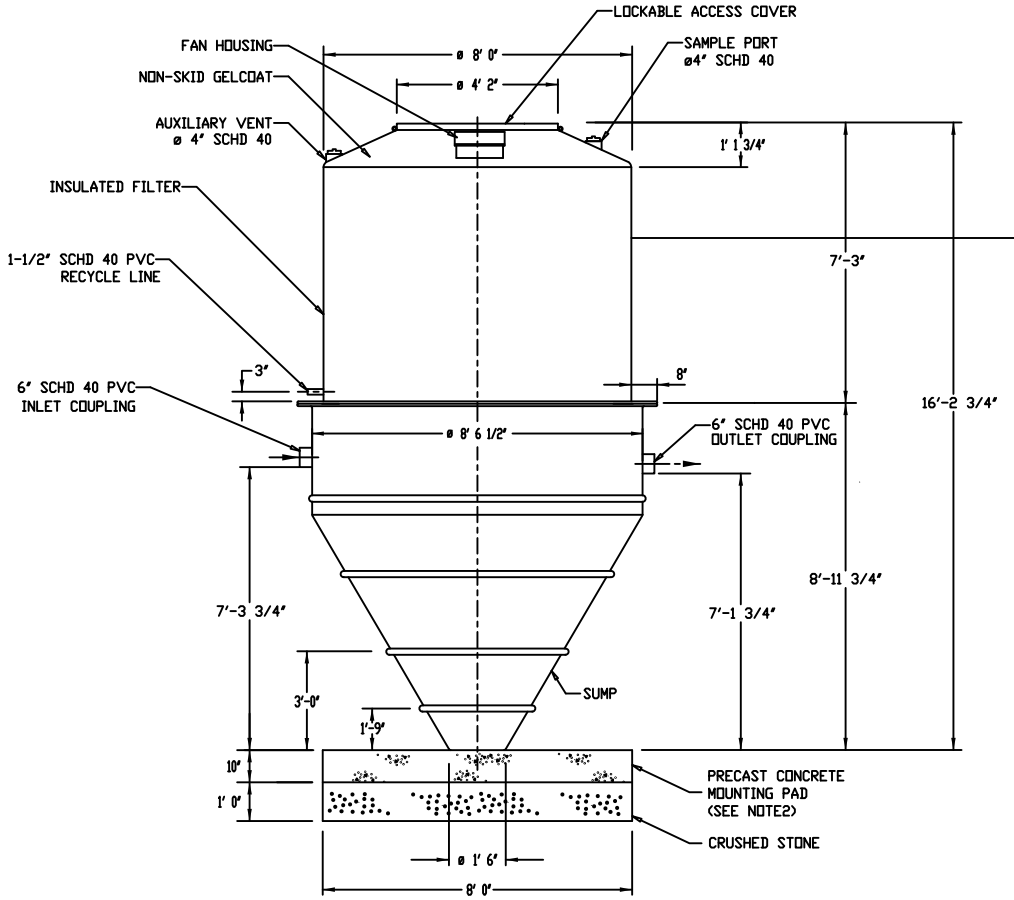
6.2 The installation of each technology shall be in accordance with the Permittee's technical requirements approved by the Secretary.

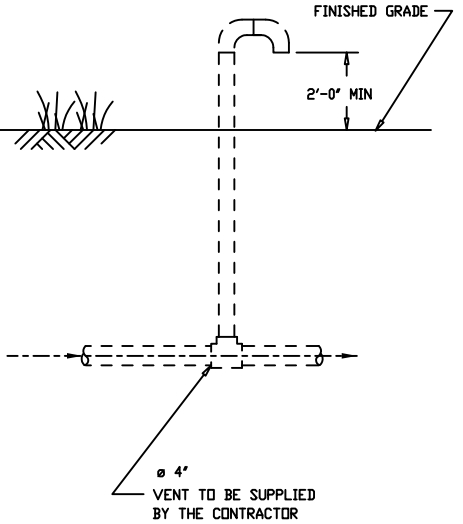
Any person aggrieved by this permit may appeal to the Environmental Court within 30 days of the date of issuance of this permit in accordance with 10 V.S.A. Chapter 220 and the Vermont Rules of Environmental Court Proceedings.

Peter Walke, Commissioner
Department of Environmental Conservation

By  Dated December 2, 2021
Cristin Ashmankas, Environmental Analyst VII
Regional Office Program
Drinking Water and Groundwater Protection Division

NOTES:
1. VENT MAY BE RUN UP THE SIDE OF BUILDING.
2. SEE DRAWING 1244-9 FOR MOUNTING PAD CONSTRUCTION DETAILS.
3. FINISHED GRADE MAY BE BETWEEN 18" ABOVE RECYCLE LINE AND 14" BELOW TOP OF UNIT.





MODEL 24/20 BIOCLERE
WITH 1600 GALLON CLARIFIER

SHIPPING WEIGHTS
WEIGHT DRY WITH MEDIA = 2350 lbs
WEIGHT DRY WITH NO MEDIA = 1750 lbs

24-20+1600 smp GA.dwg

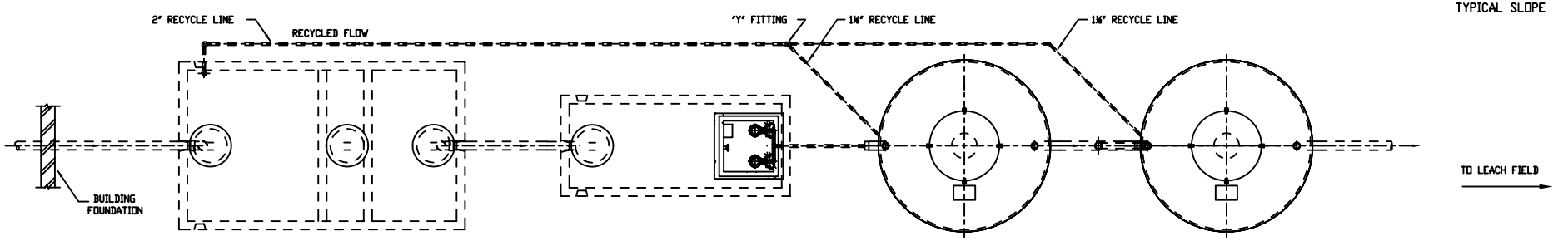
AQUAPOINT
39 TARKILN PLACE
NEW BEDFORD, MA 02745
(508) 985-9050 FAX (508) 985-9072

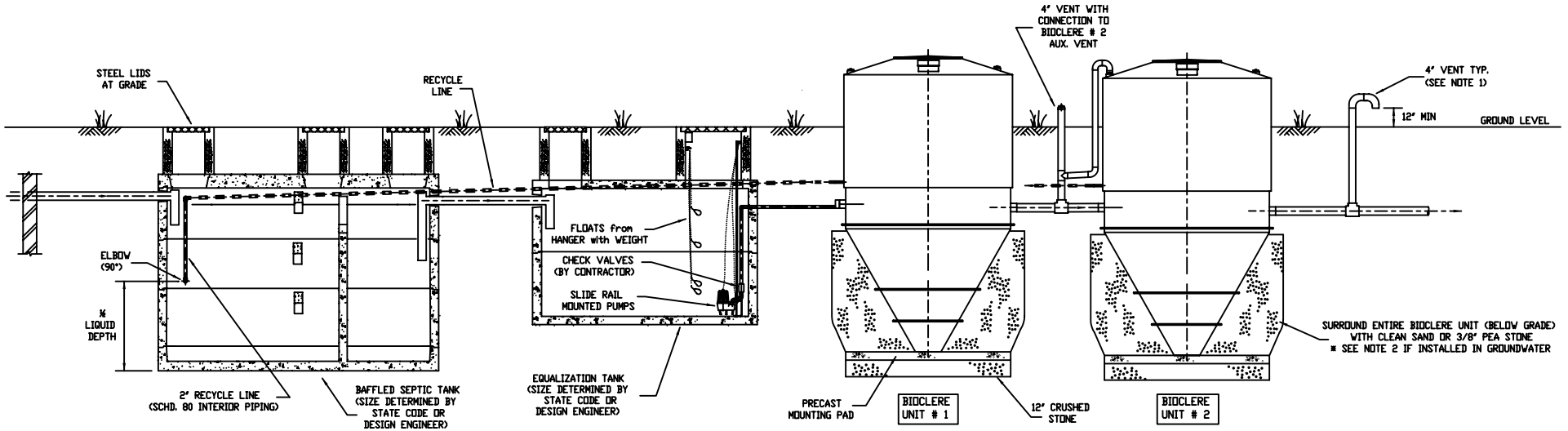
TITLE:	BIOCLERE 24/20-1600 GENERAL ARRANGEMENT
DRAWING NO:	UK.1261-3
REVISION:	C
DATE:	May 9 2008
DWN BY:	P.Willey
SCALE:	1 : 40 SIZE: B
SHEET #:	1 of 1

NOTES: UNLESS OTHERWISE SPECIFIED:
1. VENT MAY BE RUN UP TO THE ROOF OF THE BUILDING.
2. IF INSTALLED IN GROUND WATER CONTACT SITE ENGINEER FOR ANCHORING REQUIREMENTS.
3. CONTRACTOR IS TO SUPPLY ALL CONCRETE STRUCTURES AND PERFORM INSTALLATION.

GENERAL EQUALIZATION WITH SERIES BIOCLERE

PLAN ON TREATMENT PLANT





1/4"
12"
TYPICAL SLOPE

SECTION/ELEVATION OF TREATMENT PLANT

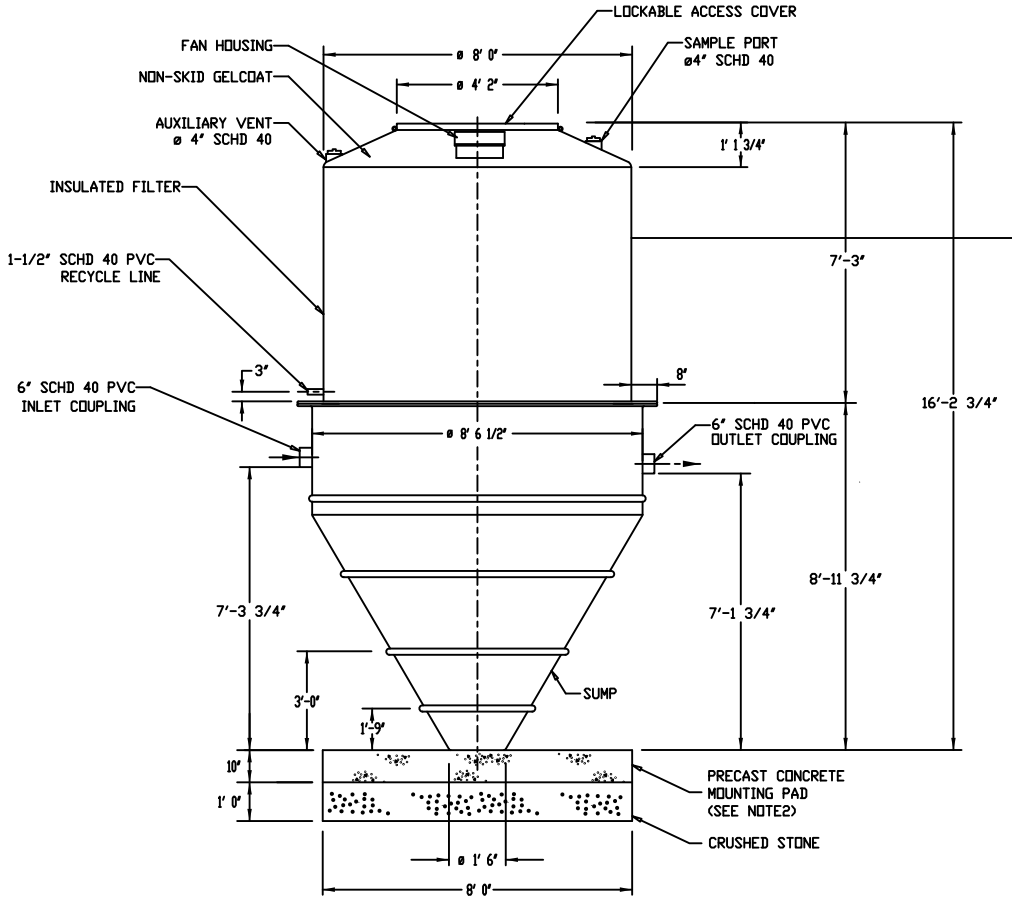
0 3' 6' 9' 12' 15' 18' 21' 24' 27' 30'

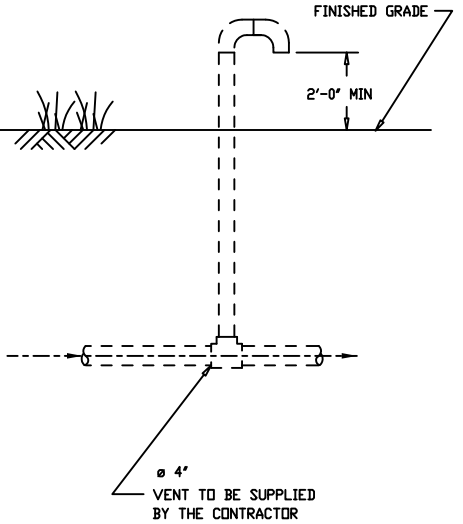
AquaPoint
Performance Based Wastewater Treatment Systems
39 TARKILN PLACE
NEW BEDFORD, MA 02745
(508) 985-9050 FAX (508) 985-9072

General EQ with Series Bioclere.dwg

TITLE:	TYPICAL GROUND INSTALLATION
DRAWING NO:	UK.1265-12
REVISION:	D
DATE:	8/29/01
DWN BY:	P.WILLEY
SCALE:	1 : 75 SIZE: B / A3
SHEET #:	1 of 1

NOTES:
1. VENT MAY BE RUN UP THE SIDE OF BUILDING.
2. SEE DRAWING 1244-9 FOR MOUNTING PAD CONSTRUCTION DETAILS.
3. FINISHED GRADE MAY BE BETWEEN 18" ABOVE RECYCLE LINE AND 14" BELOW TOP OF UNIT.





MODEL 24/20 BIOCLERE
WITH 1600 GALLON CLARIFIER

SHIPPING WEIGHTS
WEIGHT DRY WITH MEDIA = 2350 lbs
WEIGHT DRY WITH NO MEDIA = 1750 lbs

24-20+1600 smp GA.dwg

AQUAPOINT
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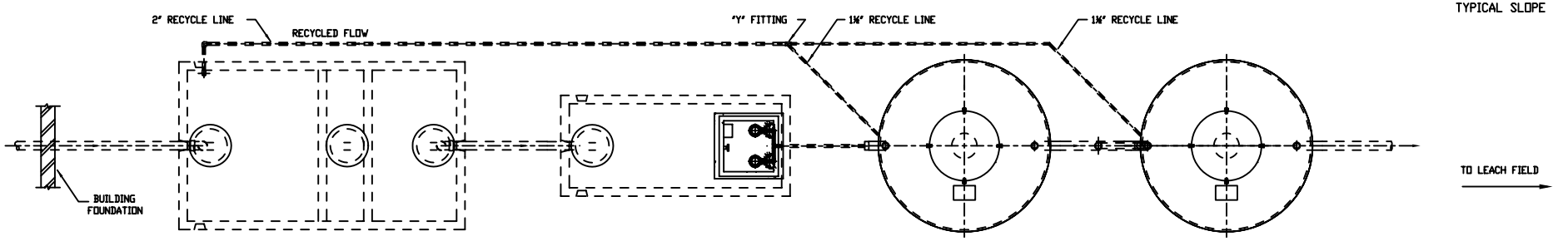
(508) 985-9050 FAX (508) 985-9072

TITLE:	BIOCLERE 24/20-1600 GENERAL ARRANGEMENT
DRAWING NO:	UK.1261-3
REVISION:	C
DATE:	May 9 2008
DWN BY:	P.Willey
SCALE:	1 : 40 SIZE: B
SHEET #:	1 of 1

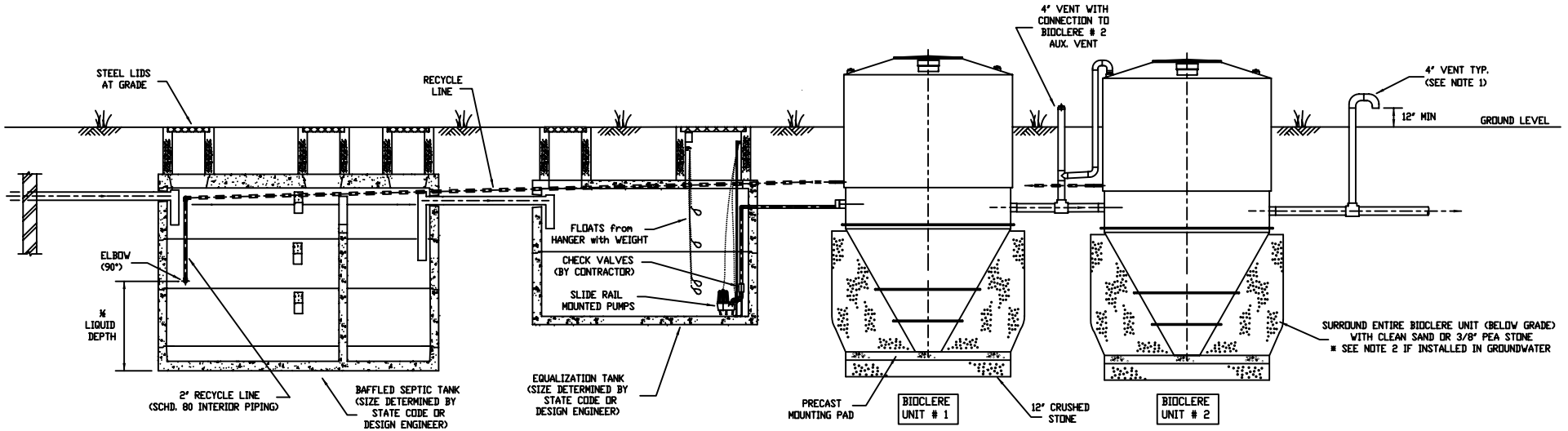
NOTES: UNLESS OTHERWISE SPECIFIED:
1. VENT MAY BE RUN UP TO THE ROOF OF THE BUILDING.
2. IF INSTALLED IN GROUND WATER CONTACT SITE ENGINEER FOR ANCHORING REQUIREMENTS.
3. CONTRACTOR IS TO SUPPLY ALL CONCRETE STRUCTURES AND PERFORM INSTALLATION.

GENERAL EQUALIZATION WITH SERIES BIOCLERE

PLAN ON TREATMENT PLANT



1/4"
12"
TYPICAL SLOPE



SECTION/ELEVATION OF TREATMENT PLANT

0 3' 6' 9' 12' 15' 18' 21' 24' 27' 30'

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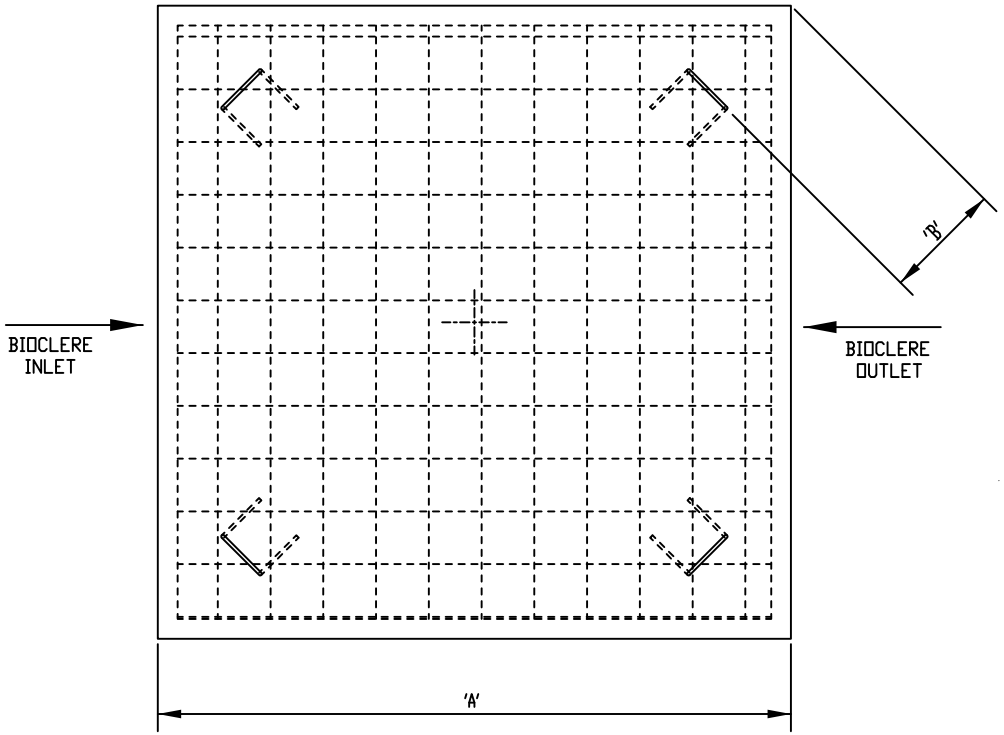
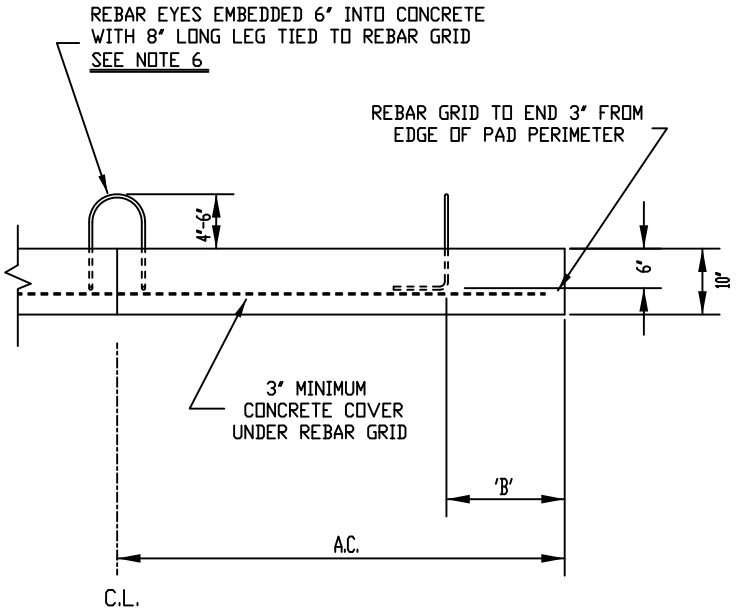
General EQ with Series Bioclere.dwg

TITLE:	TYPICAL GROUND INSTALLATION
DRAWING NO:	UK.1265-12
REVISION:	D
DATE:	8/29/01
DWN BY:	P.WILLEY
SCALE:	1 : 75 SIZE: B / A3
SHEET #:	1 of 1

PLAN ON SQUARE PAD
(SEE NOTE 5)



PAD ELEVATION
(ACROSS CORNERS)



BIOCLERE MODEL	'A'	'B'	STEEL REINFORCEMENT GRID	APPROX PAD WEIGHT
24	8'	1'6"	#3 REBAR @ 8" O.C.	8,000 lbs
30	10'	2'0"	#3 REBAR @ 6" O.C.	12,500 lbs
36	12'	2'6"	#4 REBAR @ 10" O.C.	18,000 lbs

NOTES: UNLESS OTHERWISE SPECIFIED:

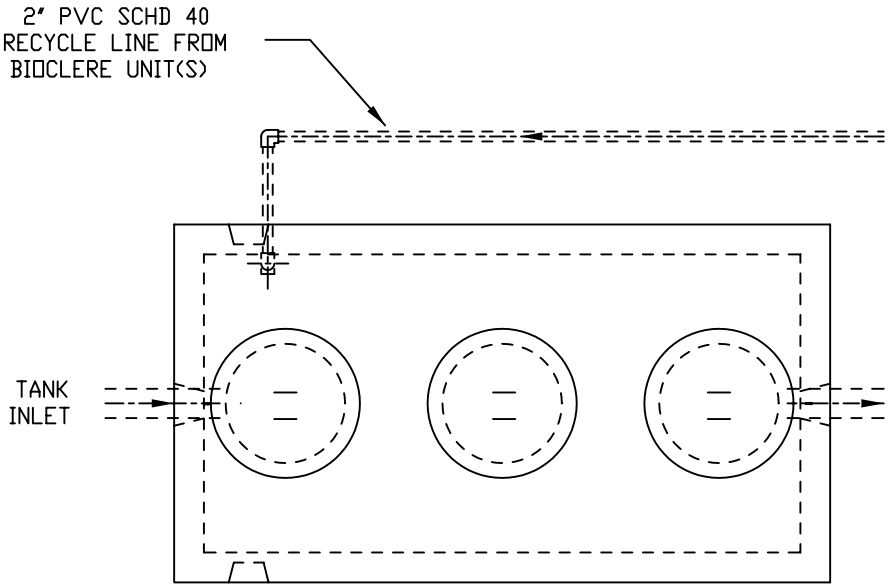
1. CONCRETE MINIMUM STRENGTH: 4,000PSI @ 28 DAYS.
2. DEFORMED REINFORCING BARS TO BE 60,000 PSI YIELD STRENGTH.
3. EYES (4): 1/2" DIAMETER REBAR CAST IN PLACE AS SHOWN.
4. PAD TO BE SUPPLIED AND INSTALLED BY CONTRACTOR.
5. CIRCULAR PADS WITH "A" = DIAMETER, CAN BE SUBSTITUTED FOR SQUARE PADS. CIRCULAR PAD REBAR EYES INSTALLED 6" FROM PAD PERIMETER.
6. REBAR EYES ARE NOT DESIGNED FOR LIFTING THE CONCRETE PAD.

Bioclere Base Pad 24 30 36.dwg

AQUAPOINT
39 TARKILN PLACE
NEW BEDFORD, MA 02745
(508) 985-9050 FAX (508) 985-9072

TITLE:	PRECAST MOUNTING PAD FOR 24, 30 & 36 SERIES BIOCLERES
DRAWING NO.:	1244-9
REVISION:	A
DATE:	1 May 2009
DWN BY:	P.WILLEY
SCALE:	(1 : 20) SIZE: B (A3)
SHEET #:	

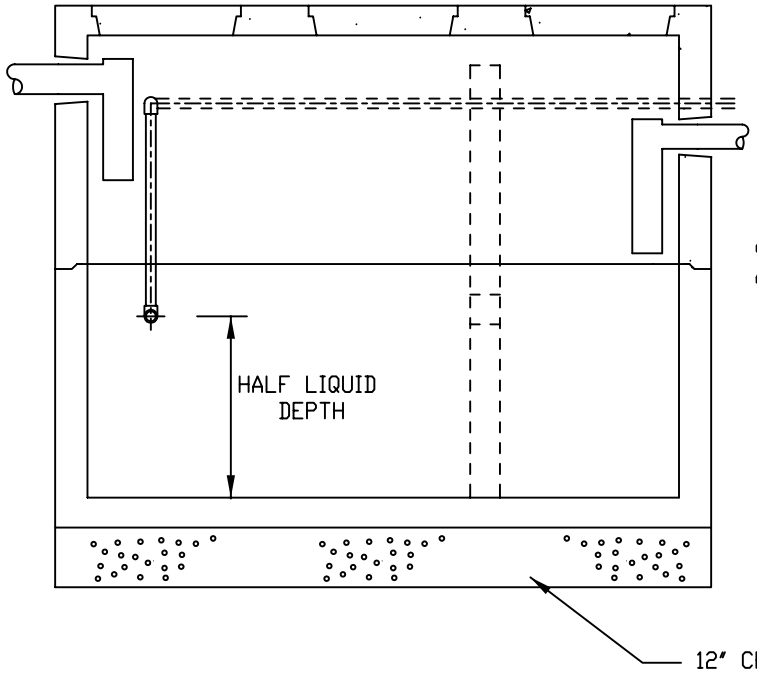
2" Biofilter Recycle Line Installation at Primary Tank.



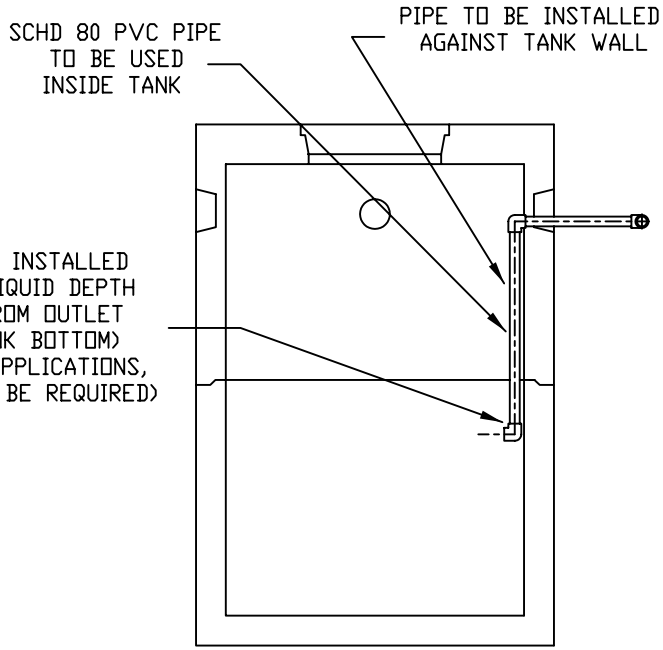
NOTES FOR CONTRACTOR:

1. SLOPE PIPE BACK TO SEPTIC TANK WITH NO LOW POINTS.
2. USE PRESSURE FITTINGS ONLY.

TYPICAL PRIMARY (SEPTIC) TANK

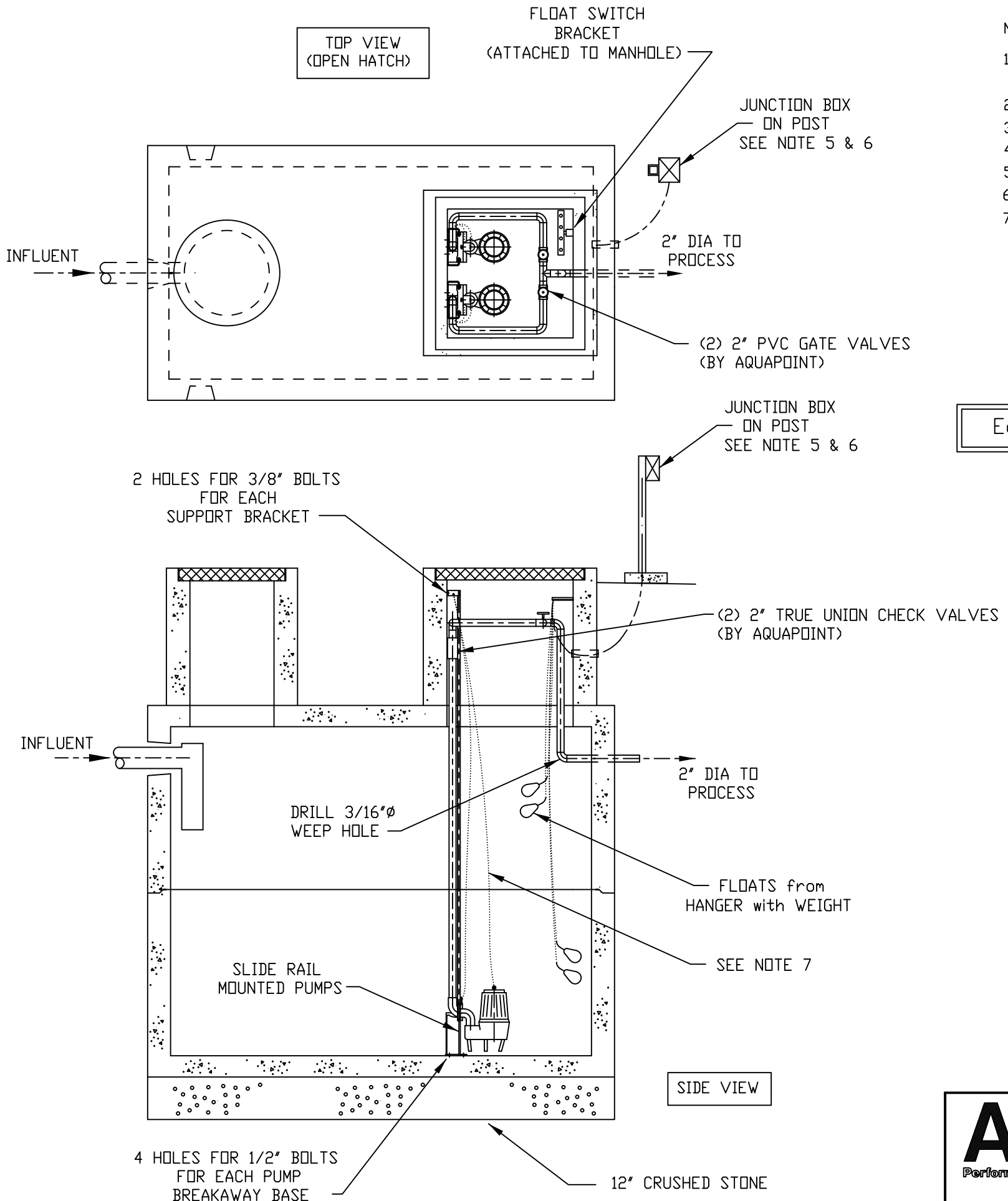


PVC 90° ELBOW INSTALLED AT CENTRE OF LIQUID DEPTH (½ DISTANCE FROM OUTLET INVERT TO TANK BOTTOM) (FOR COMMERCIAL APPLICATIONS, AN EXTENSION MAY BE REQUIRED)



AWT
Aquapoint
39 TARKILN PLACE
NEW BEDFORD, MA 02745
(508) 985-9050 FAX (508) 985-9072

TITLE:	2" Recycle Line Installation. (Primary Tank)
DRAWING NO:	PMW/1256-7
REVISION:	A
DATE:	01/19/01
DWN BY:	P.WILLEY
SCALE:	1 : 40
SIZE:	A / A4
SHEET #:	1 of 1



NOTES FOR CONTRACTOR:

1. PUMPS, FLOATS, SLIDE RAIL ASSEMBLIES, HARDWARE, VALVES AND CONTROLS BY AQUAPOINT.
2. EQUIPMENT TO BE INSTALLED BY GENERAL CONTRACTOR.
3. PROVIDE 3' x 3' (MIN) ALUMINIUM HATCH OVER PUMP ASSEMBLIES.
4. INSTALL FLOAT HANGER AT TOP OF CONCRETE RISER (MAX 18" BELOW GRADE).
5. INSTALL JUNCTION BOX OUTSIDE OF TANK ON UNISTRUT POST.
6. CONTRACTOR TO INSTALL GAS-TIGHT SEALS ON ALL ELECTRICAL CONDUITS.
7. ATTACH STAINLESS STEEL LIFTING CHAINS TO THE EQ PUMPS.

Equalization Feed Assembly

FLOAT SWITCH ELEVATION SETTINGS

1) LOW LEVEL ALARM FLOAT SWITCH (OPEN):
   6 INCHES BELOW THE LOW FLOAT,
2) LOW FLOAT SWITCH (OPEN):
   3 TO 6 INCHES ABOVE TOP OF FEED PUMPS,
3) MID LEVEL FLOAT SWITCH (CLOSED):
   12 INCHES BELOW INLET TEE INVERT,
4) HIGH LEVEL FLOAT SWITCH (CLOSED):
   6 INCHES BELOW INLET TEE INVERT.

(UNLESS SPECIFIED ON THE SITE PLANS)

EqualFeed+Rail_4F.dwg

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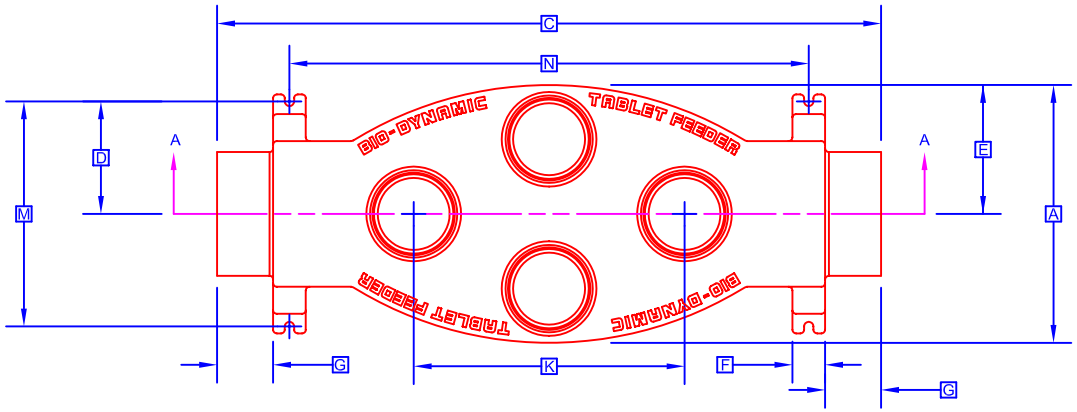
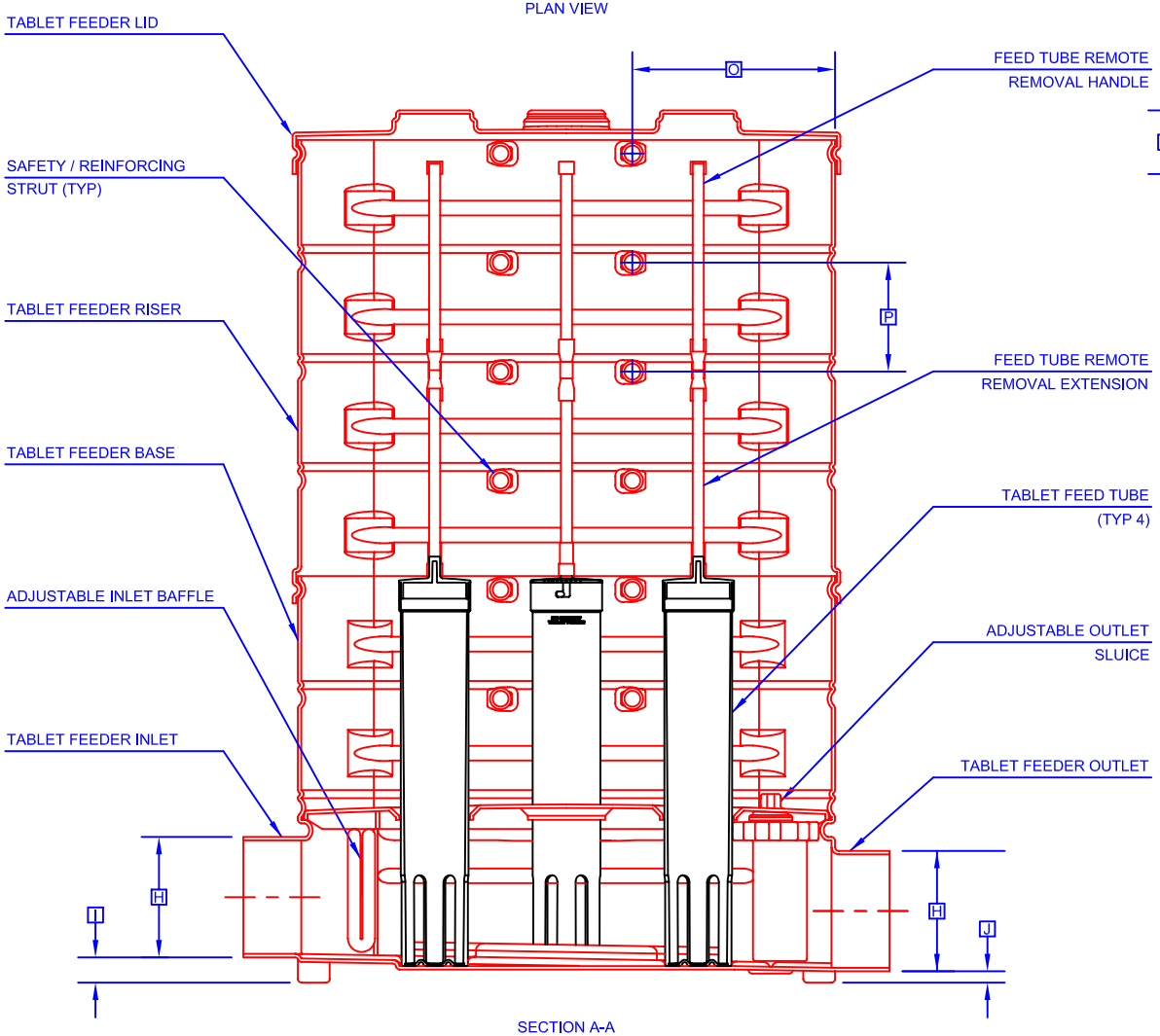
Performance Based Wastewater Treatment Systems
39 TARKILN PLACE
NEW BEDFORD, MA 02745
(508) 985-9050 FAX (508) 985-9072

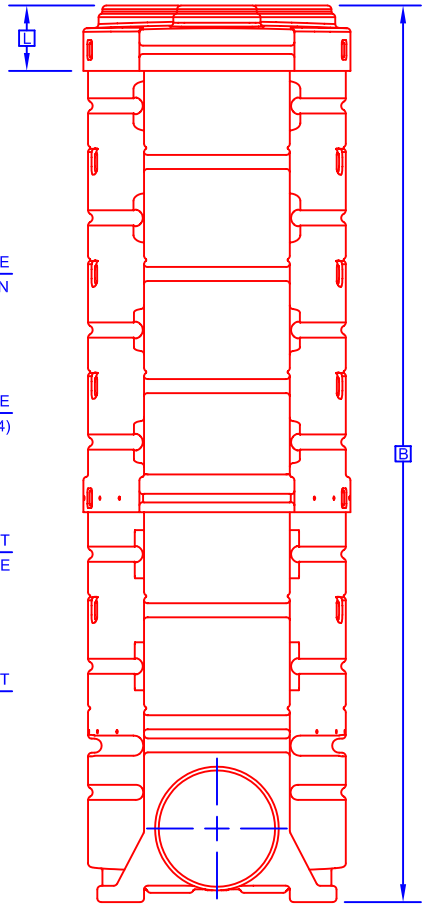
TITLE:	EQUALIZATION FEED WITH SLIDE RAIL PUMPS.
DRAWING NO:	1287-6
REVISION:	D
DATE:	March 20, 2008
DWN BY:	P.WILLEY
SCALE:	NONE
SIZE:	B / A3
SHEET #:	1 of 1



PLAN VIEW



SECTION A-A



OUTLET END VIEW

GENERAL NOTES:

1. FALL THROUGH TABLET FEEDER FROM INLET INVERT TO OUTLET INVERT IS ONE INCH ±3/8".
2. FINISHED GRADE MUST BE MAINTAINED AT LEAST SIX INCHES BELOW TOP OF LID.
3. RISER HEIGHT IS ADJUSTABLE IN SIX INCH INCREMENTS.
4. WHERE TABLET FEEDER IS INSTALLED WITHOUT MOUNTING BRACKETS, INSTALL ON FOUR INCH SAND OR FINE GRAVEL LEVELING PAD.
5. WHERE SAFETY / REINFORCING STRUTS ARE REMOVED WHILE TRIMMING RISER ALONG CUT LINES, STRUTS MUST BE REINSTALLED AT TWELVE INCH INCREMENTS. A PAIR OF STRUTS MUST BE INSTALLED IN THE TOP STRUT LOCATIONS.

PROJECT ENGINEER'S APPROVAL:
I (WE) HEREBY CERTIFY THAT THIS DRAWING HAS BEEN CHECKED AND IS APPROVED FOR USE IN CONFORMITY WITH THE CONTRACT DOCUMENTS.

DATE:

NAME:

CONTRACTOR'S CERTIFICATION:
I (WE) HEREBY CERTIFY THAT THIS DRAWING HAS BEEN CHECKED AND IS APPROVED FOR USE IN CONFORMITY WITH THE CONTRACT DOCUMENTS.

DATE:

NAME:

CRITICAL DIMENSIONS

A	1'-2 1/2"	J	0'-0 1/2"
B	2'-6" TO 10'-0"	K	1'-2 1/2"
C	2'-11 3/4"	L	0'-3 1/2"
D	0'-6"	M	1'-0"
E	0'-7 1/4"	N	2'-4"
F	0'-1 3/4" (TYP)	O	0'-11"
G	0'-3" (TYP)	P	0'-6" (TYP)
H	0'-6 5/8" (TYP)	Q	
I	0'-1 1/2"	R	

TOLERANCES

NOMINAL DIMENSIONS ARE SHOWN AND MAY VARY ±3/8" FOR ROTOMOLDED COMPONENTS.

U.S. AND FOREIGN PATENTS PENDING

NORWECO.
NORWALK WASTEWATER EQUIPMENT COMPANY

BIO-DYNAMIC ®
MODEL ITR 4000-S
TABLET FEEDER

DRAWN BY DATE	8-12-98
REVISION	A
ENGINEER	ED
APPROVED BY	JMM
DATE	10-2-97
SCALE	NTS
DRAWING NO.	PC-5-9505

BIOCLERE™

SLUDGE CALCULATION --Norwich Schools

BOD5 = Influent from raw waste + Recycle

$$BOD_5 = \left[\frac{(Q \times BOD_i \times c)}{1 \times 10^6} + \frac{(0.5 \times Q \times BOD_1 \times c)}{1 \times 10^6}\right] \times sf$$

BOD5 = **18.89761** lbs. BOD5/day

Q =	**5,460** gpd
BODi =	**400** mg/l
c =	**8.34** lb/gal
BOD1 =	**30** mg/l
TSS =	**400** mg/l
sf =	**1**

Sludge Yield for Trickling Filters (TF's)
Y = 0.047

References:
1) National Sanitation Foundation (NSF) Standard 40 test results for Bioclere Trickling Filter - May 15, 2000
2) Environmental Technology Verification (ETV) for Bioclere - US EPA - April 2003

Design Assumptions:
1) 3% sludge concentration in Bioclere clarifier = **1.872** pcf, dry (***62.4*** pcf = specific weight of water)
2) Yield = 0.047 lb VSS/lb BOD oxidized

TOTAL Sludge Production Equation:

$$Mass_{Sludge} = Q[P_S(TSS) + (1 - P_b)(Y)(BOD_5)(A_b)]$$

Variables:

Q =	Design daily flow, liters/day	**20,666**
TSS =	Concentration of TSS in influent, mg/l	**400**
Ps =	Fraction of TSS removed in primary tank	**0.6**
BOD5 =	Concentration of BOD5 in influent, mg/l	**400**
Pb =	Fraction of BOD removed in primary tank	**0.4**
Ab =	Fraction of BOD removed during aerobic treatment	**0.95**
Y =	Yield coefficient	**0.047**
VOLs =	Volume of sludge (gallons per month)	**943**
VOLd =	Volume of dry sludge (lbs per month)	**236**

VOLs = Mass/sludge concentration
= **943** gal/month

VOLd = Mass/sludge concentration
= **236** lbs/month

Note:
Sludge generation calculations are far from an exact science for the following reasons...

Bioclere Sludge Calculation

Actual sludge generation is typically far less than the calculated amount due to compaction and digestion in the primary or sludge holding tank. It is difficult to calculate actual compaction and digestion rates in a passive sludge management tank but digestion can achieve between 20% and 40% reduction in sludge volume on its own. Additionally, compaction in the sludge holding tank can result in higher % solids concentrations than the 3% used to calculate sludge generation. 3% solids is the anticipated concentration in the secondary Bioclere clarifier before evacuation.

Actual sludge generation is also usually far less than calculated because of the fact that the average daily flow and pollutant load are usually well below the design parameters. The calculations assume design flow and load 24/7/365.

The actual yield coefficient for any given site is unknown until the plant is in operation. Actual sludge yield per lb of BOD could be less than or greater than the 0.047 lbs VSS/lb BOD oxidized used in this equation. Generally, higher yields exist when BOD loading is higher and lower yields under lightly loaded conditions.

Because of the above variables, it is common for Bioclere plants to consistently generate far less than the calculated sludge yield. It is most likely that after accounting for actual flow rates and digestion in the primary that the actual sludge yield will be only about 1/3 of what is calculated above. Most similar facilities receiving apporioximately 65% of design flow require primary tank pumping every 2 years.

BIOCLERE ESTIMATED ELECTRICAL USAGE
Jobsite: Marion Cross School

AQUAPOINT

Red Font = Input
Blue Font = Output
Black Font = Constant

	HP	VOLTAGE	RUNNING AMPS	TOTAL UNITS	OPERATING UNITS	VFD SETTING	TOTAL AMPS	RUN TIME (% OF DAY)	TOTAL (KwHrs/MO)
FLOW EQUALIZATION	0.4	115	4.5	2	1	NA	4.5	0.33	122.96
BIOCLERE DOSING	0.75	115	5	4	2	NA	10	0.8	662.40
BIOCLERE RECYCLE	0.5	115	8	2	2	NA	16	0.032	42.39
BIOCLERE FAN	0.025	115	0.16	2	2	NA	0.32	1	26.50

TOTAL KwHrs/Mo:	854.25
Cost/KwHr:	0.21
Estimated Cost/Mo:	$179.39

NOTES:

(1) Amperage figures are a combination of published FLA and know operating amps.

(2) Run times vary depending on actual conditions. Above run times are conservative and assume design flow and load on the system. Blowers & mixers commonly operate at 50% of design RPM (30 Hz).

(3) Electrical estimate assumes normal conditions where only one of two redundant motors operates at a time.

ESTIMATED 20 YEAR LIFE CYCLE AND OPERATING COST FOR BIOCLERE WWTP

PROJECT SCOPE: 5,500 gpd Design Flow
Secondary Treatment + Nitrification

EQUIPMENT: 9,000 Gallon Primary Settling / Sludge Holding Tank
4,000 Gallon Flow Equalization Tank w/ Duplex 0.4 HP Pump

(2) 24/20 Bioclere Units (In Series)

* See appended general layout drawing for component details

20 YEAR OPERATING ESTIMATE:

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Electrical Consumption	$2,152	$2,152	$2,152	$2,152	$2,152	$2,152	$2,152	$2,152	$2,152	$2,152	$2,152	$2,152	$2,152	$2,152	$2,152	$2,152	$2,152	$2,152	$2,152	$2,152
Replacement Parts																				
0. 4 HP Flow EQ Pumps										$1,500										$1,500
0.75HP Bioclere Dosing Pumps							$850	$850						$850	$850					
0.5 HP Bioclere Recycle Pumps							$975	$975						$975	$975					
Bioclere Fans							$95	$95						$95	$95					
Control Panel Components							$250	$250						$250	$250					
Sludge Pumping	$2,263	$2,263	$2,263	$2,263	$2,263	$2,263	$2,263	$2,263	$2,263	$2,263	$2,263	$2,263	$2,263	$2,263	$2,263	$2,263	$2,263	$2,263	$2,263	$2,263
Sampling	$2,040	$2,040	$2,040	$2,040	$2,040	$2,040	$2,040	$2,040	$2,040	$2,040	$2,040	$2,040	$2,040	$2,040	$2,040	$2,040	$2,040	$2,040	$2,040	$2,040
Operator Contract	$650	$650	$650	$650	$650	$650	$650	$650	$650	$650	$650	$650	$650	$650	$650	$650	$650	$650	$650	$650
TOTAL	**$7,105**	**$7,105**	**$7,105**	**$7,105**	**$7,105**	**$7,105**	**$9,275**	**$9,275**	**$7,105**	**$8,605**	**$7,105**	**$7,105**	**$7,105**	**$9,275**	**$9,275**	**$7,105**	**$7,105**	**$7,105**	**$7,105**	**$8,605**

NOTES:

ELECTRICAL CONSUMPTION: The annual electrcial cost is based on the electrcial usage table included in this section of the proposal. The electrcial cost assumes a rate of $0.21 per KwH

REPLACEMENT PARTS: All mechanical parts come with a 1 yr warranty. There are (3) Pumps per Bioclere unit, (1) fan per Bioclere unit and (2) Pumps in the EQ tank. All pumps have a 6-8 year useful life
The operating estimate assumes that all of the pumps and fans are replaced between years 6 and 8 and then again between years 12 and 16. Each Bioclere pump costs about $40

SLUDGE: Sludge accumulation is expectred to be about 943 gal/mo (1/3 of what is calculated for design flow conditions in this proposal). We recommend solids be pumped when tank is 1/3 to 1/2 full with solids
This equaltes to pumping the primary tank roughly 1 time per year. The sludge pumping costs are estimated to be approximately $0.20 per gallon

SAMPLING: Sampling frequency is generally dictated by the permit requirements and therefore will likely be a fixed cost regardless of technology. BOD, TSS, NH3, TIN and Fecal laboratory analysis usually cost about $170 total. Assuming monthly sampling ($170 X 12 mo = $2,040/yr).

OPERATIONS CONTRACT: The permit may dictate onsite time requirments but assuming monthly sampling, an operator should not need to be onsite for more than 2 hrs/quarter to operate the proposed Bioclere system
Assuming $80/hr for services (common industry rate), transportation and occasional alarm condition responses it is reasonable to assume about $650 per year for labo

287 River Rd Norwich, VT 05055 * Office: 603-359-1656
~ An Equal Opportunity Employer ~

October 30, 2022
AQUA POINT
39 Tarkiln Place
New Bedford, MA 02748
Joe Pinto
jpinto@aquapoint.com

Marion Cross School, Norwich Vermont, Pre-Treatment Excavation Budget Quote

Site Logistics

• Mobilization	$5,000
• Layout and Project Management	2,000
• Erosion Control	2,000
• Construction Entrance	5,000
Total Site Logistics	$14,000

General Earthwork

• Stripping Vegetation	$5,000
• 6" Topsoil and Hydroseed	10,000
General Earthwork	$15,000

Bioclear System (Earthwork Only)

• E&B - 2" Bioclear Recycle Line (130 LF)	$6,000
• E&B Tablit Chlorinator (1 EA)	5,000
• E&B Tanks Prep For Base Pads 12" Stone (2 EA)	30,000
• E&B Miscellaneous Piping Between Tanks	3,000
• Core and Link Seal New Tank Penetrations	3,500
• Cut and Cap Bottom Connection Between Existing Dosing Tanks	3,500
• Base Concrete Pads	12,000
Total Bioclear System (Earthwork Only)	$63,000

Total Base Budget Quote **$92,000**

Budget Quote for purpose of providing excavation and prep cost only for new system. Due to lack of time to provide overall quote for the system prior to proposal being due we are unable to price the entire system as a whole. If this system is selected by the SAU to proceed we can provide more comprehensive pricing upon request.

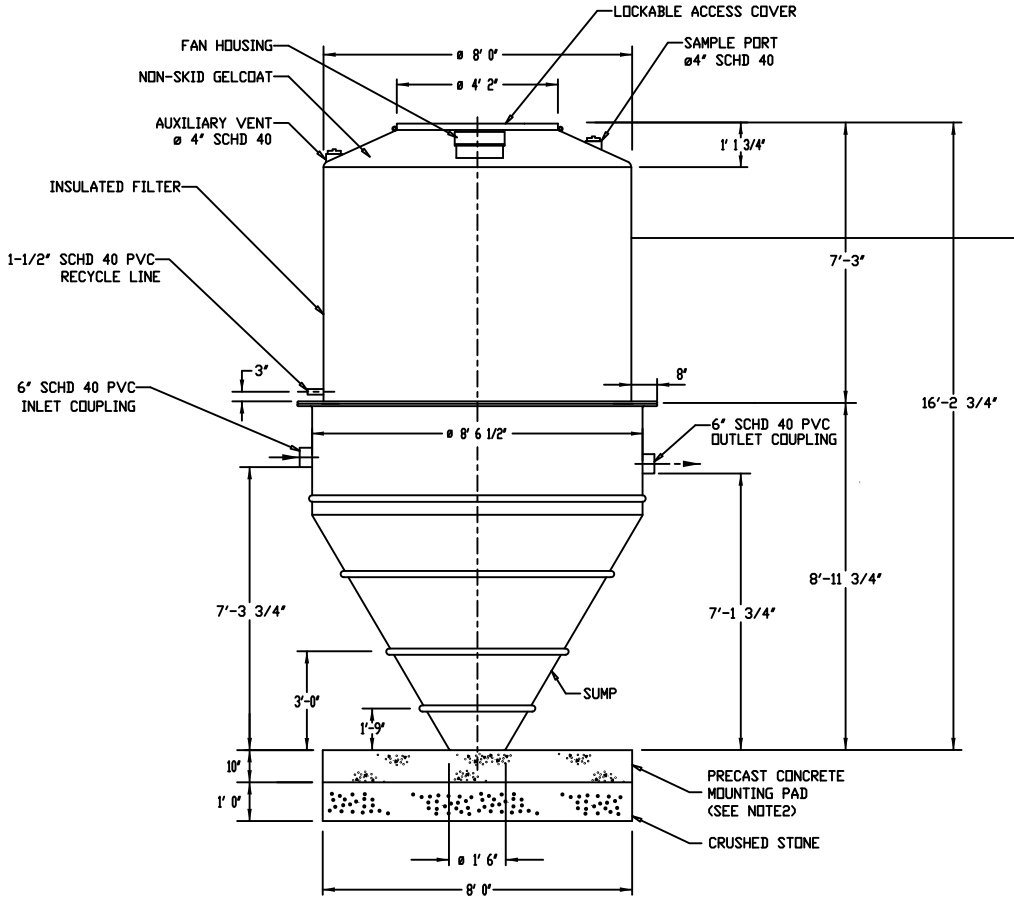
Exclusions

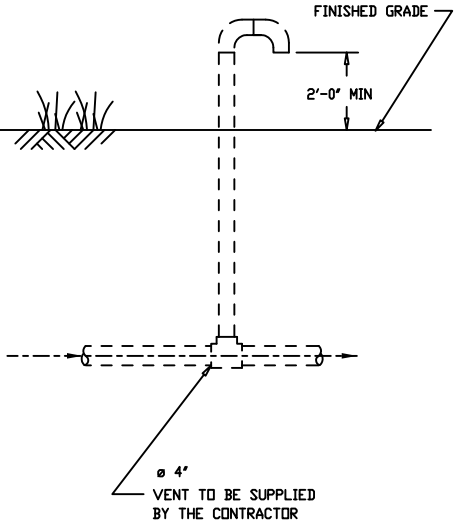
a. Pumping Existing Tanks
b. Furnish, Supply and Install New Tanks and Components
c. Furnish, Supply and Install New Chlorinator

d. Electrical Work
e. Pumps and Internal Components By Others
f. Alterations to Existing Tanks
g. Bonds

PROFILE (N.T.S.)
Dosing Chambers (See Detail)
Finish Grade - seed + mulch
Filter Fabric
2" Sch 40 PVC, laid level, ends capped
4" Sch 40 PVC
5000 Gallon
4000 Gallon
500 Gallon
8" Sch 40
Use Concrete Septic Tanks, laid level + sealed
Use Link-seals or cast-in-place rubber boots on pipe connections to tanks
Min. invert at
CUT AND CAP BOTTOM CONNECTION BETWEEN EXISTING FIELD DOSING TANKSSO THEY CAN OPERATE INDEPENTLY AS EQ AND FIELD DOSING
Grease Trap - use automatic grease removal unit on kitchen sink
All Pipe Sch 40 or SDR PVC, Glued joints
BED SECTION (N.T.S.)
Rake excavated surface prior to stone placement
3/4 - 1 1/2" Washed Crushed Stone
Dosing Chambers
Pump Criteria
Asphalt Court
Approx. Ground water Divide
EXISTING SCHOOL
PROPOSED ADDITION
INSTALL NEW 2" BIOCLERE RECYCLE LINE BACK TO HEAD OF FIRST EXISTING PRIMARY TANK.
CONVERT FIRST EXISTING 5,000 GAL FIELD DOSING TANK TO FLOW EQUALIZATION TANK. INSTALL NEW SUBMERSIBLE PUMPS, FLOATS AND CONTROLS. 2" PLUMBING TO FIRST BIOCLERE
DIRECT BURY TABLET CHLORINATOR
6" PVC PLUMBING BETWEEN BIOCLERES, CHLORINATOR AND EXISTING FIELD DOSING TANK
BIOCLERE UNITS 1 & 2 ARRANGED IN SERIES. TANKS COULD BE INSTALLED NORTH OF EXISTING DOSING TANKS IF DESIRED.
L.F. #1
L.F. #2
L.F. #3
L.F. #4
Proposed Gravel Drive (No drainage ditches)
Septic Tank Detail (NTS)
5000 Gallon
4000 Gallon
U.S. Rt. 5
Existing School
St. Barnabus Church
1" = 100'
Typical Trench Section (N.T.S.)
DESIGN DATA
500 students w/ kitchen = 10,000 g.p.d.
Required: dosing, dual alternating systems, 4 leach fields - 5,000 g.p.d. each
Septic Tanks:
S.T. #1 - 5000 gallon
#2 - 4000
APPROVED
DIVISION OF PROTECTION
7/26/88
PB-3-0867
OFFICE COPY
Village has community water supply
SEWAGE DISPOSAL SYSTEM DESIGN
MARION CROSS SCHOOL
NORWICH, VERMONT
SCALE 1":20'
APRIL 21, 1988
Revised 6/10/88
Revised 6/26/88
Revised 6/30/88
K.A. LECLAIR ASSOC., INC.
CIVIL ENGINEERS
HANOVER, N.H.
PROJECT NO. 112987A

NOTES:
1. VENT MAY BE RUN UP THE SIDE OF BUILDING.
2. SEE DRAWING 1244-9 FOR MOUNTING PAD CONSTRUCTION DETAILS.
3. FINISHED GRADE MAY BE BETWEEN 18" ABOVE RECYCLE LINE AND 14" BELOW TOP OF UNIT.





MODEL 24/20 BIOCLERE
WITH 1600 GALLON CLARIFIER

SHIPPING WEIGHTS
WEIGHT DRY WITH MEDIA = 2350 lbs
WEIGHT DRY WITH NO MEDIA = 1750 lbs

24-20+1600 smp GA.dwg

AQUAPOINT
39 TARKILN PLACE
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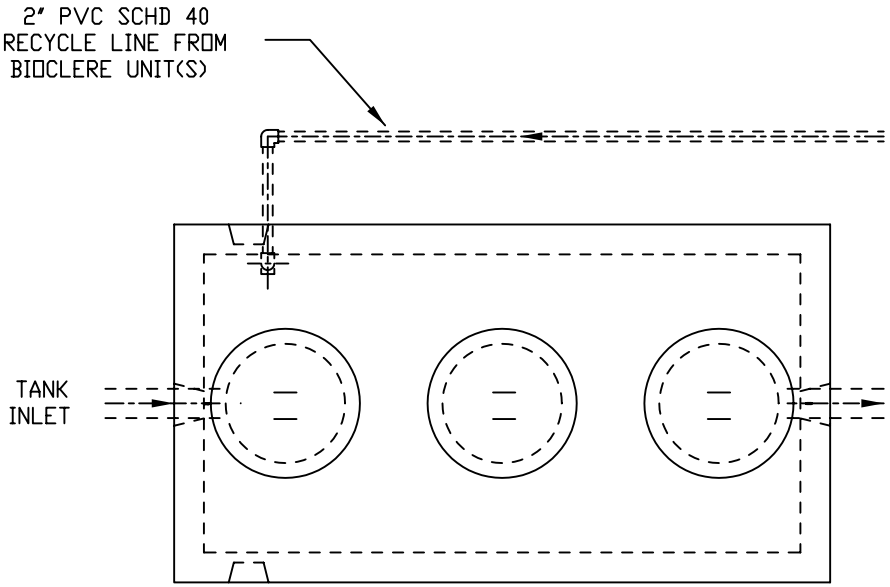
(508) 985-9050 FAX (508) 985-9072

TITLE:	BIOCLERE 24/20-1600 GENERAL ARRANGEMENT
DRAWING NO:	UK.1261-3
REVISION:	C
DATE:	May 9 2008
DWN BY:	P.Willey
SCALE:	1 : 40 SIZE: B
SHEET #:	1 of 1

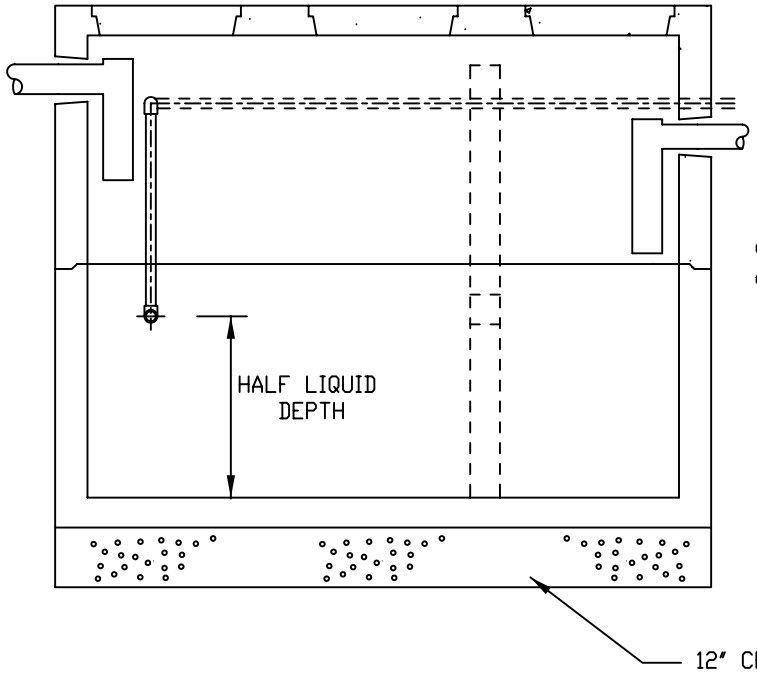
2" Biofilter Recycle Line Installation at Primary Tank.



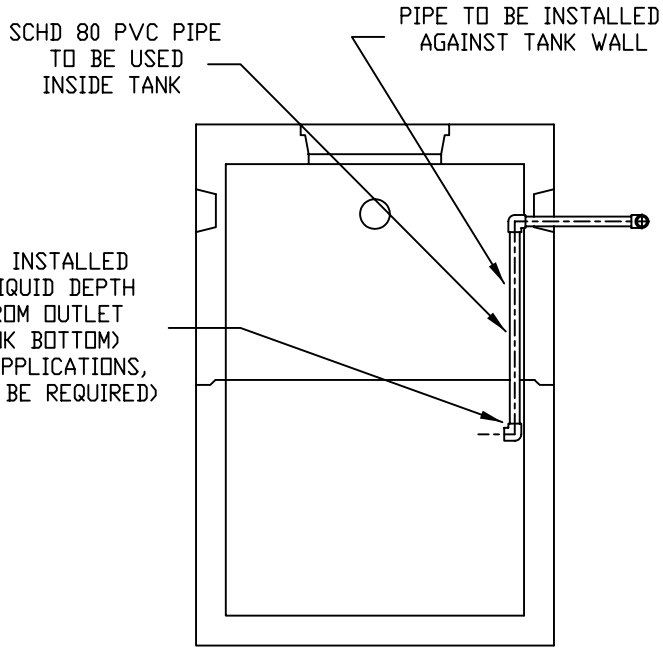
NOTES FOR CONTRACTOR:

1. SLOPE PIPE BACK TO SEPTIC TANK WITH NO LOW POINTS.
2. USE PRESSURE FITTINGS ONLY.

TYPICAL PRIMARY (SEPTIC) TANK



PVC 90° ELBOW INSTALLED AT CENTRE OF LIQUID DEPTH (½ DISTANCE FROM OUTLET INVERT TO TANK BOTTOM) (FOR COMMERCIAL APPLICATIONS, AN EXTENSION MAY BE REQUIRED)



AWT
Aquapoint
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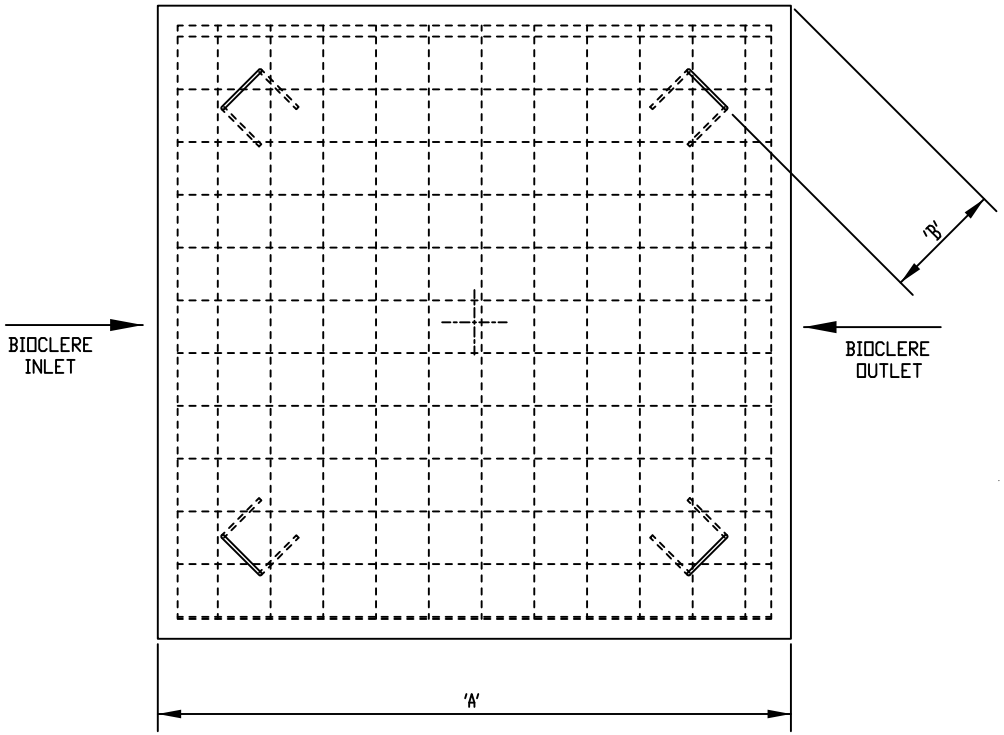
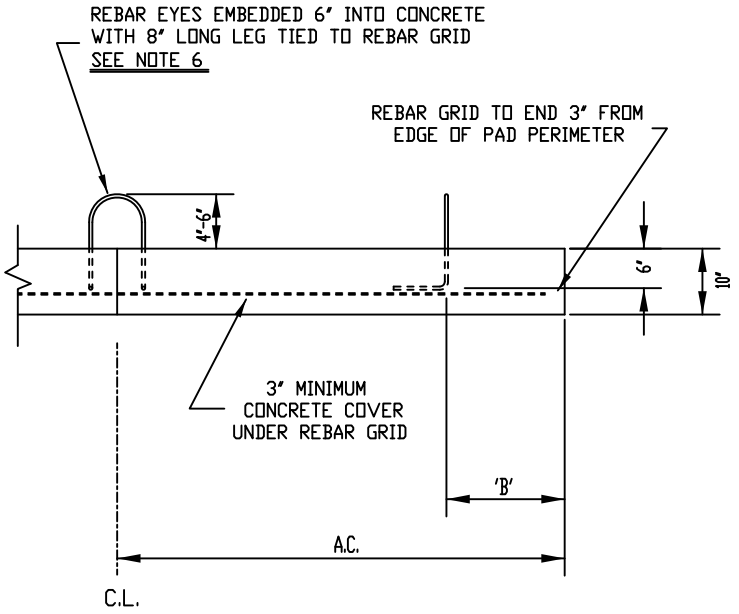
NEW BEDFORD, MA 02745
(508) 985-9050 FAX (508) 985-9072

TITLE:	2" Recycle Line Installation. (Primary Tank)
DRAWING NO:	PMW/1256-7
REVISION:	A
DATE:	01/19/01
DWN BY:	P.WILLEY
SCALE:	1 : 40 SIZE: A / A4
SHEET #:	1 of 1

PLAN ON SQUARE PAD
(SEE NOTE 5)



PAD ELEVATION
(ACROSS CORNERS)



BIOCLERE MODEL	'A'	'B'	STEEL REINFORCEMENT GRID	APPROX PAD WEIGHT
24	8'	1'6"	#3 REBAR @ 8" O.C.	8,000 lbs
30	10'	2'0"	#3 REBAR @ 6" O.C.	12,500 lbs
36	12'	2'6"	#4 REBAR @ 10" O.C.	18,000 lbs

NOTES: UNLESS OTHERWISE SPECIFIED:

1. CONCRETE MINIMUM STRENGTH: 4,000PSI @ 28 DAYS.
2. DEFORMED REINFORCING BARS TO BE 60,000 PSI YIELD STRENGTH.
3. EYES (4): 1/2" DIAMETER REBAR CAST IN PLACE AS SHOWN.
4. PAD TO BE SUPPLIED AND INSTALLED BY CONTRACTOR.
5. CIRCULAR PADS WITH "A" = DIAMETER, CAN BE SUBSTITUTED FOR SQUARE PADS. CIRCULAR PAD REBAR EYES INSTALLED 6" FROM PAD PERIMETER.
6. REBAR EYES ARE NOT DESIGNED FOR LIFTING THE CONCRETE PAD.

Bioclere Base Pad 24 30 36.dwg

AQUAPOINT
39 TARKILN PLACE
NEW BEDFORD, MA 02745
(508) 985-9050 FAX (508) 985-9072

TITLE:	PRECAST MOUNTING PAD FOR 24, 30 & 36 SERIES BIOCLERES
DRAWING NO.:	1244-9
REVISION:	A
DATE:	1 May 2009
DWN BY:	P.WILLEY
SCALE:	(1 : 20) SIZE: B (A3)
SHEET #:	