

**Arkansas Department of Environmental Quality  
No-Discharge Section Permit Application  
Subsurface Disposal System**

<b>Permit No.:</b> (Office Use Only)	<b>AFIN:</b> (Office Use Only)	<b>SIC Code:</b>	<b>NAICS Code:</b>
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**1. Permit Action and Type** (Please check one of the following):

Operator Type: <input checked="" type="checkbox"/> Corporation (State of Incorporation: <u>AR</u> )	<input type="checkbox"/> Limited Liability Company (State of LLC: _____)
<input type="checkbox"/> Partnership	<input type="checkbox"/> Sole Proprietorship/Private
<input type="checkbox"/> Public Entity (Type: _____)	
<input checked="" type="checkbox"/> New Permit	<input type="checkbox"/> Renewal
<input type="checkbox"/> Modification of Permit, Describe: _____	
<input type="checkbox"/> Carwash/Truck Wash	<input type="checkbox"/> Domestic Septic System
<input checked="" type="checkbox"/> Drip Irrigation System	<input type="checkbox"/> Laundromat
<input type="checkbox"/> Slaughter House	<input type="checkbox"/> Other _____

**2. Permittee Legal Name and Mailing Address:** (Must Match Arkansas's Secretary of State)

Owner Name: <u>Sloan Estates Property Owners Assoc Inc.</u>			
Address: <u>PO Box 70918</u>		Phone Number: _____	
City: <u>Fayetteville</u>	State: <u>AR</u>	Zip Code: <u>72703</u>	
Contact Person: (Mr. / Mrs. / Ms.) <u>Luis Valez</u>		Email: _____	
Title: <u>Agent</u>	Phone Number: <u>479 582-0015</u>	Cell Number: <u>479 202-3500</u>	

**3. Facility Location** (physical address is required; NO P.O. BOX):

Facility Name: <u>Sloan Estates Subdivision</u>			
Address (911 Address): <u>5088 Sagely Ln</u>		Phone Number: _____	
City: <u>Fayetteville</u>	State: <u>AR</u>	Zip Code: <u>72703</u>	
1/4 Sec.: _____	Section: <u>33</u>	Township: <u>17 North</u>	Range: <u>29 West</u>
Latitude: <u>38</u> Deg <u>6'</u> Min <u>25"</u> N	Longitude: <u>94</u> Deg <u>5'</u> Min <u>18</u> W	Source Datum: <u>NAD83</u>	
County: <u>Washington</u>	Nearest Town: <u>Fayetteville</u>		
Nearest Stream: <u>Mudd Creek</u>	Distance: _____ (ft)	Stream Segment: <u>4K</u>	

**4. Consultant Information:**

Name: <u>Charlie Presley P.E.</u>	Consulting Firm: <u>Presley Brannan</u>
Email: <u>Cjpreslemadisoncounty.net</u>	Phone Number: <u>(479) 738-6430</u>
Address: <u>PO Box 607</u>	Cell Number: <u>(479) 409-6550</u>
City: <u>Huntsville</u>	State: <u>AR</u>
Zip Code: <u>72740</u>	

**Please read the following carefully and sign below.**

I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, which may include fines and/or imprisonment.

**SIGNATORY REQUIREMENTS:**

The information contained in this form must be certified by a **responsible official** as defined below:

**Corporation:** principal officer at least the level of vice president (must be an officer or register agent with the secretary of state)

**Partnership:** a general partner

**Sole Proprietorship:** the proprietor/owner

**Municipal, state, federal, or other public facility:** principal executive officer, or ranking elected official

Responsible Official: JR MECKS  
JR Meeks Title: Director  
Responsible Telephone: 479-582-6005 Email: JRMeeks@chambers-bank.com  
Responsible Signature: JR Meeks Date: 8/19/13

**Cognizant Official** is an individual that is given signature authority from the Responsible Official

Cognizant Official: LUIS VELAZ Title: AGENT  
Cognizant Telephone: 479-202-3500 Email: LUISVELAZ@chambers-bank.com  
Cognizant Signature: [Signature] Date: 8/19/13

**PERMIT REQUIREMENT VERIFICATION** (Please check the following to verify the completion of permit requirements.)

- | Yes                                 | No                                  |  |
|-------------------------------------|-------------------------------------|--|
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Submittal of Complete Application<br>Does the Owner name match the Secretary of State (Corporation or Limited Liability Company)?<br>Does the Responsible Official match the Secretary of State?                 |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Submittal of Waste Management Plan<br>Stamped & Signed by an Arkansas Registered PE/ ADH Designated Representative<br>Are maps and site description included?  |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Submittal of Operation/Maintenance Plan (nonmunicipal wastewater treatment systems)<br>Is the cost estimate included?  |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Submittal of Disclosure Statement (completed and executed)<br>Not required for public entity   |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Submittal of Land use Contract/Deed/Lease  |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Arkansas Department of Health notification letter (letter transmitting documents to ADH)<br>(New permits or modified permits)  |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | Provide Certificate of Good Standings with the Arkansas Secretary of State<br>(If foreign corporation, provide Certificate of Good Standings from the state of Origin) <span style="float: right;">coming</span> |

ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY

5301 NORTHSHORE DRIVE / NORTH LITTLE ROCK / ARKANSAS 72118-5317 / TELEPHONE 501-682-0744 / FAX 501-682-0880  
www.adeq.state.ar.us

# INSTRUCTIONS FOR DISCLOSURE STATEMENT

Arkansas Code Annotated Section 8-1-106 requires that all applicants for the issuance, or transfer of any permit, license, certification or operational authority issued by the Arkansas Department of Environmental Quality (ADEQ) file a disclosure statement with their applications. The filing of a disclosure statement is mandatory. No application can be considered complete without one.

Disclosure statement means a written statement by the applicant that contains:

- The full name and business address of the applicant and all affiliated persons;
- The full name and business address of any legal entity in which the applicant holds a debt or equity interest of at least five percent (5%) or that is a parent company or subsidiary of the applicant, and a description of the ongoing organizational relationships as they may impact operations within the state;
- A description of the experience and credentials of the applicant, including any past or present permits, licenses, certifications, or operational authorizations relating to environmental regulation;
- A listing and explanation of any civil or criminal legal actions by government agencies involving environmental protection laws or regulations against the applicant and affiliated persons in the ten (10) years immediately preceding the filing of the application, including administrative enforcement actions resulting in the imposition of sanctions, permit or license revocations or denials issued by any state or federal authority, actions that have resulted in a finding or a settlement of a violation, and actions that are pending;
- A listing of any federal environmental agency and any other environmental agency outside this state that has or has had regulatory responsibility over the applicant; and
- Any other information the Director of the Arkansas Department of Environmental Quality may require that relates to the competency, reliability, or responsibility of the applicant and affiliated persons.

## Exemptions:

The following persons or entities are not required to file a disclosure statement:

- Governmental entities, consisting only of subdivisions or agencies of the federal government, agencies of the state government, counties, municipalities, or duly authorized regional solid waste authorities as defined by § 8-6-702. (This exemption shall not extend to improvement districts or any other subdivision of government which is not specifically instituted by an act of the General Assembly.)
- Applicants for a general permit to be issued by the department pursuant to its authority to implement the National Pollutant Discharge Elimination System for storm water discharge.
- If the applicant is a publicly held company required to file periodic reports under the Securities and Exchange Act of 1934 or a wholly owned subsidiary of a publicly held company, the applicant shall not be required to submit a disclosure statement, but shall submit the most recent annual and quarterly reports required by the Securities and Exchange Commission which provide information regarding legal proceedings in which the applicant has been involved. The applicant shall submit such other information as the director may require that relates to the competency, reliability, or responsibility of the applicant and affiliated persons.

## **Exemptions continued:**

The following permits, licenses, certifications, and operational authorizations are also exempt from submitting a disclosure statement:

- **Hazardous Waste Treatment, Storage, and Disposal Permit Modifications (Class 1, 2, and 3), as defined in Arkansas Pollution Control and Ecology Commission (APC&EC) Regulation 23;**
- **Phase 1 Consultants, as defined in APC&EC Regulation 32;**
- **Certifications for Operators of Commercial Hazardous Waste Facilities, as defined in APC&EC Regulation 23 § 264.16(f);**
- **Regulated Storage Tank Contractor or Individual License Renewals as defined in APC&EC Regulation 12;**
- **Certifications for Persons Operating and Maintaining Underground Storage Tank Systems which Contain Regulated Substances, as defined in APC&EC Regulation 12.701, *et. seq.*;**
- **Laboratory Certifications, as defined in Ark. Code Ann. § 8-2-201, *et. seq.*;**
- **Individual Homeowners seeking coverage under General Permit ARG5500000;**
- **Wastewater Operator Licenses, as defined in APC&EC Regulation 3;**
- **Water Permit Modifications for permits issued under the authority of the Arkansas Water and Air Pollution Control Act (Ark. Code Ann. §8-4-101, *et. seq.*);**
- **Solid Waste Permit Modifications for permits issued under APC&EC Regulation 22;**
- **Solid Waste Landfill Operator License Renewals, as defined in Regulation No. 27;**
- **Air Permit Modifications for permits issued under APC&EC Regulations 18, 19, and 26; and**
- **Asbestos Certification Renewals, as defined in Regulation 21.**

Deliberate falsification or omission of relevant information from disclosure statements shall be grounds for civil or criminal enforcement action or administrative denial of a permit, license, certification, or operational authorization.

# ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY DISCLOSURE STATEMENT

## Instructions for the Completion of this Document:

- A. Individuals, firms or other legal entities with no changes to an ADEQ Disclosure Statement, complete items 1 through 5 and 18.
- B. Individuals who never submitted an ADEQ Disclosure Statement, complete items 1 through 4, 6, 7, and 16 through 18.
- C. Firms or other legal entities who never submitted an ADEQ Disclosure Statement, complete 1 through 4, and 6 through 18.

Mail to:  
ADEQ  
DISCLOSURE STATEMENT  
[List Proper Division(s)]  
5301 Northshore Drive  
North Little Rock, AR 72118-5317

Hand Deliver to:  
ADEQ  
DISCLOSURE STATEMENT  
[List Proper Division (s)]  
5301 Northshore Drive  
North Little Rock, AR 72118-5317

1. APPLICANT: (Full Name) Sloan Estates Property Owners Assoc.  
2. MAILING ADDRESS (Number and Street, P.O.Box Or Rural Route):  
P O BOX 10918  
3. CITY, STATE, AND ZIP CODE:  
Fayetteville, AR 72703

4. (check all that apply.)
- Individual     Corporate or Other Entity
- Permit     License     Certification     Operational Authority
- New Application     Modification     Renewal Application (If no changes from previous disclosure statement, complete number 5 and 18.)
- Air     Water     Hazardous Waste     Regulated Storage Tank     Mining     Solid Waste
- Environmental Preservation and Technical Service

### 5. Declaration of No Changes:

The violation history, experience and credentials, involvement in current or pending environmental lawsuits, civil and criminal, have not changed since the last Disclosure Statement I filed with ADEQ on \_\_\_\_\_

\_\_\_\_\_  
Signature of Individual or Authorized Representative of Firm or Legal Entity  
(Also complete #18.)

6. Describe the experience and credentials of the Applicant, including the receipt of any past or present permits, licenses, certifications or operational authorization relating to environmental regulation. (Attach additional pages, if necessary.)

*None*

7. List and explain all civil or criminal legal actions by government agencies involving environmental protection laws or regulations against the Applicant \* in the last ten (10) years including:

1. Administrative enforcement actions resulting in the imposition of sanctions;
2. Permit or license revocations or denials issued by any state or federal authority;
3. Actions that have resulted in a finding or a settlement of a violation; and
4. Pending actions.

(Attach additional pages, if necessary.)

*None*

8. List all officers of the Applicant. (Add additional pages, if necessary.)

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

STREET: \_\_\_\_\_

CITY, STATE, ZIP: \_\_\_\_\_

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

STREET: \_\_\_\_\_

CITY, STATE, ZIP: \_\_\_\_\_

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

STREET: \_\_\_\_\_

CITY, STATE, ZIP: \_\_\_\_\_

9. List all directors of the Applicant. (Add additional pages, if necessary.)

NAME: JR Meeks TITLE: Director

STREET: PO Box 10918

CITY, STATE, ZIP: Fayetteville, AR 72703

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

STREET: \_\_\_\_\_

CITY, STATE, ZIP: \_\_\_\_\_

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

STREET: \_\_\_\_\_

CITY, STATE, ZIP: \_\_\_\_\_

10. List all partners of the Applicant. (Add additional pages, if necessary.)

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

STREET: \_\_\_\_\_

CITY, STATE, ZIP: \_\_\_\_\_

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

STREET: \_\_\_\_\_

CITY, STATE, ZIP: \_\_\_\_\_

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

STREET: \_\_\_\_\_

CITY, STATE, ZIP: \_\_\_\_\_

11. List all persons employed by the Applicant in a supervisory capacity or with authority over operations of the facility subject to this application.

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

STREET: \_\_\_\_\_

CITY, STATE, ZIP: \_\_\_\_\_

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

STREET: \_\_\_\_\_

CITY, STATE, ZIP: \_\_\_\_\_

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

STREET: \_\_\_\_\_

CITY, STATE, ZIP: \_\_\_\_\_

12. List all persons or legal entities, who own or control more than five percent (5%) of the Applicant's debt or equity.

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_  
STREET: \_\_\_\_\_  
CITY, STATE, ZIP: \_\_\_\_\_

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_  
STREET: \_\_\_\_\_  
CITY, STATE, ZIP: \_\_\_\_\_

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_  
STREET: \_\_\_\_\_  
CITY, STATE, ZIP: \_\_\_\_\_

13. List all legal entities, in which the Applicant holds a debt or equity interest of more than five percent (5%).

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_  
STREET: \_\_\_\_\_  
CITY, STATE, ZIP: \_\_\_\_\_

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_  
STREET: \_\_\_\_\_  
CITY, STATE, ZIP: \_\_\_\_\_

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_  
STREET: \_\_\_\_\_  
CITY, STATE, ZIP: \_\_\_\_\_

14. List any parent company of the Applicant. Describe the parent company's ongoing organizational relationship with the Applicant.

*N/A*

NAME: \_\_\_\_\_  
STREET: \_\_\_\_\_  
CITY, STATE, ZIP: \_\_\_\_\_

Organizational Relationship:

15. List any subsidiary of the Applicant. Describe the subsidiary's ongoing organizational relationship with the Applicant.

*N/A*

NAME: \_\_\_\_\_  
STREET: \_\_\_\_\_  
CITY, STATE, ZIP: \_\_\_\_\_

Organizational Relationship:



16. List any person who is not now in compliance or has a history of noncompliance with the environmental laws or regulations of this state or any other jurisdiction and who through relationship by blood or marriage or through any other relationship could be reasonably expected to significantly influence the Applicant in a manner which could adversely affect the environment.

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

STREET: \_\_\_\_\_

CITY, STATE, ZIP: \_\_\_\_\_

NA

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

STREET: \_\_\_\_\_

CITY, STATE, ZIP: \_\_\_\_\_

9.5 MILES

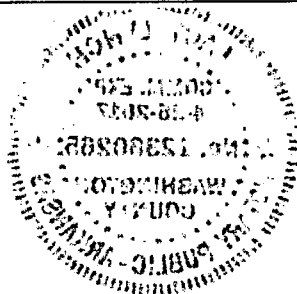
17. List all federal environmental agencies and any other environmental agencies outside this state that have or have had regulatory responsibility over the Applicant.

None

WATER  
SOLID WASTE  
AIR

Forest  
is

Joe [unclear]



04-22-2014

18. VERIFICATION AND ACKNOWLEDGEMENT

The Applicant agrees to provide any other information the director of the Arkansas Department of Environmental Quality may require at any time to comply with the provisions of the Disclosure Law and any regulations promulgated thereto. The Applicant further agrees to provide the Arkansas Department of Environmental Quality with any changes, modifications, deletions, additions or amendments to any part of this Disclosure Statement as they occur by filing an amended Disclosure Statement.

DELIBERATE FALSIFICATION OR OMISSION OF RELEVANT INFORMATION FROM DISCLOSURE STATEMENTS SHALL BE GROUNDS FOR CIVIL OR CRIMINAL ENFORCEMENT ACTION OR ADMINISTRATIVE DENIAL OF A PERMIT, LICENSE, CERTIFICATION OR OPERATIONAL AUTHORIZATION.

State of \_\_\_\_\_

County of \_\_\_\_\_

I, JR MEEKS, swear and affirm that the information contained in this Disclosure Statement is true and correct to the best of my knowledge, information and belief.

APPLICANT SIGNATURE:

*[Handwritten Signature]*

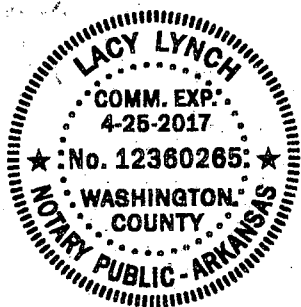
COMPANY TITLE:

DIRECTOR

DATE:

8/19/2013

SUBSCRIBED AND SWORN TO BEFORE ME THIS 19 DAY OF August 2013



*[Handwritten Signature]*  
NOTARY PUBLIC

MY COMMISSION EXPIRES:

04-25-2017

TECHNICAL SPECIFICATIONS

FOR

SLOAN ESTATES  
WASTEWATER TREATMENT  
AND DISPERSAL SYSTEM  
FAYETTEVILLE, ARKANSAS

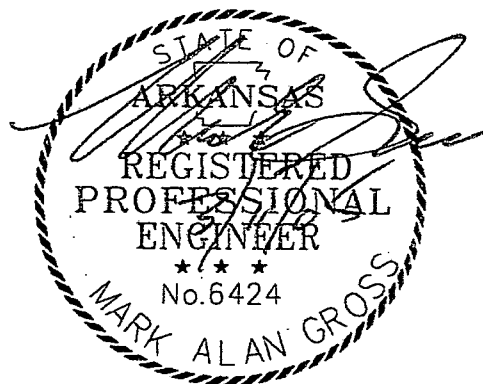
PREPARED BY

RURAL ENGINEERING SERVICES, INC.

PREPARED FOR:

THE BARBER GROUP

FEBRUARY 28, 2005



## SECTION 1.0

### PIPING

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Piping for all of the wastewater treatment and dispersal system

#### PART 2 - PRODUCTS

##### 2.01 Materials

- A. All materials shall conform to the respective specifications and other requirements specified herein except where noted otherwise on the drawings. No deviation from the material specified will be allowed without prior written approval from the Owner/Engineer.
- B. All pressure sewer lines shall be Polyvinyl Chloride (PVC) and all pipe installed shall be of the type, size, class, and thickness indicated in these specifications and/or on the drawings.
- C. Pressure Sewer Mains shall be the diameter specified on the drawings and shall be Class 200, SDR-21 PVC pipe. The pipe shall be bell and spigot type supplied in 20 foot lengths except for special fittings to connect to the tanks, the treatment units, the drip irrigation tubing, and the alternating zone valves. These special fittings may require solvent-weld joints as necessary. All pipe must bear the approval of the National Sanitation Foundation. The pipe shall also meet the following requirements.
  - 1. The pipe shall be made from Class 12454-A or Class 12454-B virgin compounds conforming to ASTM D1784, Type 1, Grade 1 (PVC 1120), or clean rework materials generated from the manufacturer's own production provided they comply with all applicable requirements of ASTM D1784 and produce a product equal in quality to that derived from the virgin compounds.
  - 2. The pressure rating of the pipe shall conform to the requirements and specifications of ASTM D2241.
  - 3. The minimum wall thickness of the bell, at any point shall conform to the SDR requirements of the pipe.
  - 4. Provision shall be made for expansion and contraction at each joint by use of a gasket type joint. No field made solvent weld joints will be permitted except as herein specified or shown on the drawings. Where special adapters are required, they shall be fashioned by the manufacturer.

- D. Fittings shall be either PVC, fiberglass, or ductile iron. PVC fittings shall meet the material specification above and shall be gasketed push-on type except where solvent weld is specified. Ductile iron fittings shall conform to AWWA Standard C110. The fittings used shall be bell and spigot, flanged, or mechanical joint type.
- E. Air and Vacuum Release Valves shall be PVC valves and shall be located at all highpoints of pressure piping and at the high point of each drip irrigation zone. Enclosure shall be PVC 24" Diameter with a fiberglass gasketed bolt-down lid.
- F. Concrete for thrust blocks shall be provided as necessary and shall have a 28-day compressive strength of at least 3,000 psi. Cement, sand, and aggregate shall be free from all the foreign matter graded and proportioned and the concrete shall be mixed, transported, deposited, and cured in accordance with standards adopted by the American Concrete Institute. All material shall be subject to the approval and testing of the Engineer.
- G. Reinforcing Bars shall be "Billet-Steel Concrete Reinforcement Bars" conforming to the requirements of ASTM A15 or "Rail-Steel Concrete Reinforcement Bars" conforming to the requirements of ASTM A16. No field bending of rail-steel bars will be permitted. All reinforcing bars shall be deformed bars. Deformation shall comply with the "Minimum Requirements for the Deformation of Deformed Steel Bars for Concrete Reinforcement-ASTM A305".

## **PART 3 – EXECUTION**

### **3.01 CLEARING AND GRUBBING**

- A. All construction for this project will take place within the public right-of-way, easements, or on property owned by the Owner.
- B. Where necessary, the construction areas and easements shall be cleared of all fences, trees, logs, stumps, brush, vegetation, rubbish, and/or any other material considered by the Owner/Engineer to be in the way of construction.
- C. Upon completion of the work, the construction area shall be cleaned up and left in a neat manner, free of all objectionable debris or material. Where permanent improvements were disturbed, they shall be returned to as near as original condition as possible unless otherwise directed by the Owner.

### **3.02 TRENCH EXCAVATION**

- A. Trenches for pressure lines shall be of the width and depth necessary for the proper installation of the pipe. All sewer lines shall be laid in trenches of such depth as to provide a minimum cover of 30 inches over the pipe unless otherwise shown on the plans.

- B. The bottom of the trench shall be accurately graded so that the pipe will be in continuous and uniform contact with the select backfill and have a longitudinal bearing on undisturbed soil for the length of the pipe.
- C. If the soil at the bottom of the trench is mucky or if the subgrade is too soft to properly support the pipe, the Contractor shall stabilize the subgrade. Where rock is encountered, a 6-inch cushion of sand or fine soil shall be placed in the trench prior to placing the pipe. In either case, the subgrade shall meet the approval of the Owner/Engineer.
- D. Blasting will be permitted only when proper precautions are taken for the protection of persons, the work, and adjacent property. Any damage done to the work or property by blasting shall be the responsibility of the Contractor. All operations involving the handling, storage, and use of explosives shall be conducted in accordance with the latest rules, regulations, legal ordinances, and State and Federal laws.
- E. Upon termination of a day's work, or before leaving the jobsite for any lengthy period of time, the Contractor shall cover all open ends of laid pipe with a j-plug or cap.

### 3.03 BEDDING AND BACKFILL

- A. After pipe work has been approved, trenches, where encasement is not required, shall be bedded with fine loose earth free from clods or stones larger than  $\frac{1}{2}$  inch in diameter and of proper moisture content. This selected material shall be carefully deposited in layers not to exceed 4 inches in thickness on both sides of the pipe and thoroughly and carefully compacted around the pipe to provide no less than 12 inches of cover over the pipe. The remainder of the backfill may be native material free from stones or clods larger than 8 inches in any dimension, and may then be placed by a dozer or any approved method that will not injure or disturb the pipe.
- B. When the material excavated from the trench does not yield enough select material at the trench site to meet the specifications for proper backfill and bedding materials, sufficient additional select material shall be hauled from other sources to provide a 12 inch cushion of selected material over the pipe or as otherwise specified.
- C. All trenches and excavations shall be backfilled immediately after the pipe is laid, using methods that will not disturb the pipe. Material used for backfilling shall consist of the excavation or borrow of sand, gravel, or other materials approved by the Engineer and shall be free of trash, large rock, lumber, or other debris.
- D. It is the intent of this specification that all trenches be backfilled, settled and the ground restored to its original condition as soon as possible after the pipe has been installed. Any unnecessary delay in restoring trenches to their original condition shall constitute just cause for stopping all other work until the trenches are so

restored. The Contractor shall be responsible for all settlement of backfill in trenches occasioned by the work covered herein. He shall refill trenches as soon as necessary to bring them back to original grade and during the period when settlement is occurring shall refill them frequently enough to maintain traffic without hazard at all times.

- E. All excavated material that is unsuitable or not needed for the backfill shall be placed in a stockpile for disposal at the completion of the project. The contractor shall be responsible for disposing of the excess material. Surfaces shall be cleaned up, all earth piles smoothed down, and the surface left neat and workmanlike. Where existing culverts or drainage ditches are disturbed or obstructed with excavated material, such material shall be entirely removed and the culvert or ditch shall be left true to original line, grade, and condition.
- F. Backfill under paved surfaces shall be compacted with a pneumatic tamper in layers not to exceed 4 inches thick for the entire depth of the trench. Material shall not be deposited by a dozer or other equipment when the paved surface is in place at the time of backfill.

#### 3.04 CUTTING AND REPLACING SPECIAL SURFACES

- A. Whenever it becomes necessary in excavating to disturb special surfaces such as paved or gravel roadways, drives, walks, or parking areas, the Contractor shall use care not to disturb or destroy any special surfaces other than what is absolutely necessary for completing the work. In these instances, care shall be used in placing the backfill to eliminate future settlement and the surface shall be restored using the same type of materials that were used in the original surface and in accordance with any details for such work which may be contained in respective specifications.
- B. The Contractor shall replace all special surfaces as soon as complete settlement has occurred. However, on highways and asphalt streets the Contractor shall compact the backfill to a point 10 inches below the paved surface and shall then pour a pad of concrete to a point 2 inches below the surface. After 72 hours the remaining volume shall be filled with cold mix asphalt and rolled until the surface is smooth.
- C. The Contractor shall maintain these repaired areas as often as necessary to provide a smooth crossing that is not hazardous to traffic.
- D. On gravel-surfaced streets and other areas, the gravel will be disturbed in excavating for trenches. After the backfill has been placed so that no further appreciable settlement will occur, gravel over the trench shall be replaced to the same compacted thickness as the original surfacing. During construction, the gravel of the remainder of the street not occupied by the trench may be covered with dirt from the excavation. After completion of the backfill in the trench, such dirt shall be removed, in so far as possible, and additional gravel shall be placed on

the street until the surface is as weather-resistant and traffic-resistant as the original surfacing.

- E. In disturbing bituminous or concrete surfaces, the Contractor must cut the surface with the approved tools or equipment ahead of the trenching operation if in the opinion of the Owner/Engineer the edges of the surface will be damaged during the trenching.
- F. Prior to the replacement of bituminous or concrete pavement, the edge of the pavement along each side of the trench will be trued and straightened and the subgrade and base material replaced in accordance with the original surfacing.

### 3.05 HANDLING AND LAYING PIPE FITTINGS

- A. Pipe and fittings shall be installed to match the proper diameter as indicated in the plans.
- B. In the transportation, unloading, and handling of the pipe it shall not be dropped, let roll or collide with other pipe, or be subject to any unnecessary jar, impact, or other treatment that might crack, chip, scar, or otherwise damage the pipe.
- C. The inside of the bell and outside of the pipe end or spigot shall be thoroughly cleaned of all dirt, mud, grease, and other foreign material before starting the joint.
- D. Joints in the pipe shall be made in accordance with the manufacturer's recommendations, with care taken to avoid excessive deflections in any joint. The inside of the pipe shall be cleaned of all foreign material before the pipe is placed in service. The ends of the pipe shall be temporarily plugged at the close of each day's work.

### 3.06 SETTING VALVES AND FITTINGS

- A. Valves, plugs, and other fittings shall be set and jointed to pipe in the manner recommended by the manufacturer and approved by the Owner/Engineer if not shown on the drawings.
- B. Valves shall be located as shown on the plans and valve boxes or risers shall be set to finish grades.
- C. Valve boxes or risers shall be provided for every valve. The valve box or riser shall not transmit shock or stress to the valve and shall be centered and plumb over the operating nut or the valve, with the lid flush with the surface of the ground or such other level as may be directed by the Owner/Engineer.
- D. All dead ends shall be terminated with one-way cleanouts as shown on the drawings.



### 3.07 TESTING

- A. All sections of the pipe shall be given a hydrostatic pressure test. This test shall be performed by the contractor in the presence of the Owner/Engineer.
- B. The test shall be made by filling each section of line to be tested slowly with water, expelling all air. Pressure shall be applied by means of a pressure pump and maintained for at least two hours.
- C. The test pressure shall be at 50% above normal operating pressure. The maximum leakage per hour shall be calculated by the following formula:

$$L = \frac{ND\sqrt{P}}{7400}$$

L = Allowable Leakage (gallons per hour)  
N = Number of Joints in Pipeline Tested  
D = Nominal Diameter of Pipeline Tested (inches)  
P = Test Pressure (psi)

- D. The Contractor shall furnish all pressure gauges, meters, pumps, fittings, materials, and labor necessary to assist the Engineer in making these tests. Should any section of line disclose defects or leaks greater than allowed, the contractor shall repair, at his own expense, defective pipe until the leakage is within the specified allowance.

SECTION 2.0  
STEP INTERCEPTOR TANKS  
AND PUMPING SYSTEMS

1.02 PRIMARY TREATMENT – SEPTIC/INTERCEPTOR TANKS

A. Minimum tank volume is 1,250 gallons for a 3-bedroom home. All tanks must be watertight. All seams, joints, openings, and pipe fittings must be watertight. After installation and backfilling, a water tightness test comprised of filling the dosing tank with water will be required. The tank shall be filled six inches into the riser and allowed to sit. After 24 hours, the water level should be raised back to the 6 inch level inside the riser. The tank must maintain the filled water level for 24 hours to be considered acceptable.

If leakage is observed, the contractor may make one attempt to repair the tank, fittings, connections, and riser in place and retest the tank in accordance with the procedure specified above.

If after one attempt to repair the tank, fittings, connections and riser, leakage is observed during the retest, the tank shall be removed from the excavation and replaced with a watertight tank, fittings, connections, and riser at the expense of the contractor, tank supplier and tank manufacturer.

B. Tank material must be high density rotomolded polyethylene manufactured from virgin compounds with no "re-grind.." Septic tanks shall be pre-manufactured and brought to the site. Single compartment tanks shall be used. Length of septic tank must be at least twice the width of the tank. Tank must have a baffled 4" inlet. Outlet must draw from 35% to 45% of tank liquid depth. Access openings must be a minimum 18" diameter. Suitable anchoring devices must be used in areas with a high water table. Tanks shall be manufactured by Rochester Rotational Molding, Inc., Rochester, IN, USA. Tanks shall be RRM model 1250 SPTN gallon tanks as shown on the plans.

C. Zoeller Effluent Turbine STEP system, p/n 5030-0050 shall be used to pump to a small diameter pressurized force main. The filter shall retain particulate in the waste stream greater than 1/16<sup>th</sup> inch. Filter must be constructed of durable, resilient, non-corrosive, and non-degradable materials able to operate without deformation under normal conditions in a septic tank environment. The filter must be able to prevent escape of sludge or scum during normal operation and in the event of a malfunction, including filter clogging. Filters must be designed for easy, trouble free removal and reinstallation into the pump vault without the removal of the pump or changing the float settings. STEP filter must contain at least 850 linear feet of 1/16<sup>th</sup> inch filtration and 637 sq. inches of open area.

D. The submersible pump or pumps shall be Zoeller Pump Company, p/n 5030-0005, ½ Hp, 115 VAC 6-stage effluent turbine pumps. Pumps shall be capable of handling septic tank effluent. Pumps shall be submersible 'deep well' type construction. The pump shell shall be constructed of a heavy 300 series stainless steel that is crush proof and corrosion-resistant. The motor must be of stainless steel and composite construction for corrosion resistance, and UL 778-recognized and CSA-certified. A floating stack pump design with progressive staging shall allow abrasive particles to flow through, reducing the chance of pump lockup. A non-floating stack design shall not be considered equal. Each pump shall run in liquid before being shipped. It shall be checked at its maximum running point for performance, amps, grounding, winding insulation integrity, and water tightness. The pump shall be supplied with a multi-conductor SO type power cord. Components required for repair of the pump shall be readily available within 24 hours. Special tools shall not be required to service the pump. A network of service stations shall be available nationwide in those cases where service requirements are beyond the scope of in-house service mechanics.

E. Zoeller Company threaded check valves, and Zoeller Company Flexible Discharge assembly 1 1/4-inch, shall be provided for each pump. Discharge assemblies shall be constructed of PVC schedule 40 pipe. Discharge assemblies shall be factory assembled to save time and effort in the field. Discharge assemblies shall have a minimum of two 14" sections of pressure rated flexible PVC pipe for ease of connection and service. Flexible hose connections may not be substituted for the flexible PVC pipe because of field maintenance considerations. A schedule 80 ball valve and union must be provided with each assembly. A grommet type pipe seal is required on discharge connection to seal the riser from unwanted water intrusion.

F. A 3-hanger float tree must be provided with each pump. The float tree shall be constructed of non-corrosive materials. Float clamps must be secured to float tree with a stainless steel positive stop set screw. Alternative means of securing float clamp via a friction hold or attaching to the pump discharge pipe is not acceptable. Float cord must be laced through float clamp for a permanent tether.

G. The CONTRACTOR shall furnish and install a completely pre-wired automatic control panel of the type utilizing float switch control for pump control and alarm indication. The automatic pump control system shall be either simplex or duplex demand dosing control panel manufactured by Zoeller Pump Company, Louisville, KY. The control panel shall be assembled and tested by a supplier meeting UL Standard 508 for industrial controls. The same manufacturer must be used that supplied the STEP system to insure compatibility, matching the proper panel and features with the pump or pumps being supplied, and single source responsibility for the equipment supplied. Float switches located in the wet well will control the pump sequence. The float switch cable length shall be 10-feet. Level controls will be set up in the STEP system in the following order from lowest water level to highest:

- 1<sup>st</sup> level – Redundant Off
- 2<sup>nd</sup> level – Pump On-Off
- 3<sup>rd</sup> level – High water alarm

H. The control panel shall be housed in a NEMA 4X thermoplastic enclosure. Panel shall include a visible and audible high water alarm with dry auxiliary contacts, motor control relay, pump disconnect switch, control power disconnect switch, selector switches, and external power on light. The enclosure shall have a hinged front cover with lockable hasp. The visual high water alarm shall be a top mounted red beacon with 360-degree visual check. A wiring schematic shall be provided and stored in a plastic packet provided in the enclosure. The schematic is to be an exact representation of the panel circuitry identifying the terminal locations for the float switch, pumps, and incoming power connections. All ground wires shall be terminated at the grounding lug furnished inside the enclosure.

H. Zoeller 24" diameter Septic Tank Riser shall be used to bring the access opening to grade. The seam between the tank and riser must be watertight. The riser and lid combination must be able to support a 2,500 lb. wheel load. Plastic or poly risers are not considered equal. The riser must be adjustable in the field for cut off 3" above grade. Concrete risers are not considered equal. The lid must have a green non-skid finish for blending into the homeowner's landscape. Lid shall have a watertight connection to the riser pipe. The lid must have a gasket around the connection between the lid and the riser pipe to prevent odors. The lid shall have stainless steel recessed hex (Allen) type screws countersunk flush with the top of the riser, and shall be secured to prevent entry by unauthorized persons.

I. Tank Installation shall be as follows:

Measure and excavate hole for proper sizing and to be sure of that hole follows the curvature of the tank. The bottom of the hole must be level and undisturbed. If rock or potentially sharp objects are present at the bottom of the hole, provide a 6 to 8 inch base of pea gravel. Never place tank directly on sharp objects or rocks. However if there is a good, level, undisturbed base this may not be necessary.

Place tank into hole using lifting lugs at each end of tank, or manually set the tank by hand. It is not necessary or recommended to use manhole opening or inlet and outlet piping to lift tank into place. Level tank with carpenter or laser level.

The maximum factory recommended burial depth for septic tanks is 24" from tank top to surface grade. Pump tanks are recommended to be installed at similar depths but may be buried at a depth not to exceed 48 inches.

Begin backfilling columns with either pea gravel or sand if present. Excavated aggregates may be used so long as the material is loose and can avoid the common voids associated with heavy clay materials. If water is present directly beneath tank

bottom place bucket gently on top of the tank while filling tank with water to offset hydrostatic pressures. If a high water may be a continual threat it is then recommended that pea gravel or sand is used in backfilling columns. Re-level tank if necessary.

Begin backfilling around the tank; continue to compact aggregate around tank to eliminate voids within the backfilling material. Filling the tank with water during this process is not required as long as water is not present beneath the tank, and extremely heavy clays are not being used as backfill material.

Once the tank has been completely backfilled it is suggested to fill tank with water, if high water tables or heavy soil conditions exist. This process is beneficial in allowing the product and soils to begin settling into place. It is also advantageous for those unexpected rainfalls that may hit prior to tank settling.

The act of filling the tank with water in good site conditions to eliminate deformation of the tank is not necessary.

Pump tank installation should follow similar procedures, however it is acknowledged by the manufacture that the tank will not remain at full capacity for extended periods of time and as long as the appropriate procedures listed above for high water tables and poor soil conditions were instituted, the appropriate minimum liquid depth should range between 6 to 18 inches.

SECTION 3.0

EQUALIZATION TANK  
AND DOSING TANK

*Final  
Settling  
2*

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The Equalization Tank for the wastewater treatment system and the dosing tank for the irrigation system. One equalization tank shall be provided having a nominal capacity of 8,000 (eight thousand) gallons. One dosing tank shall be provided having a nominal capacity of 4000 (four thousand) gallons.

PART 2 - PRODUCTS

2.01 Tanks

- A. The tanks shall be single-wall fiberglass underground tank manufactured by Xerxes Corporation.
- B. the tanks shall be supplied with the fittings shown on the plans in the locations shown on the plans.
- C. Loading Conditions: Tank shall meet the following design criteria:
1. Internal Load: Tank shall be designed to withstand a 5-psig air-pressure test (3 psig for a 12-foot tank) with a 5:1 safety factor.
  2. Surface Loads: Tank shall withstand surface H-20 axle loads when properly installed according to manufacturer's current installation instructions.
  3. External Hydrostatic Pressure and Burial Depth: The Settling tanks shall be capable of being buried in ground with 7 feet of overburden, the hole fully flooded and a safety factor of 5:1 against general buckling.

The dosing tank shall be capable of being buried in the ground with 3 feet of overburden, the hole fully flooded, and a safety factor of 5:1 against buckling.

4. Tank shall support accessory equipment—such as inlet and outlet piping, effluent-filter chamber, ladders and baffles—as shown on tank drawings and when installed according to tank manufacturer's recommendations.

**B. Product Storage:**

1. Tank shall be capable of storing septic tank effluent limited to the collection and storage of human solid or liquid organic sewage.
2. Tank shall be vented to atmospheric pressure as the tank is not designed as a pressure vessel.

**C. Materials:**

1. Tank shall be manufactured of 100% resin and glass-fiber reinforcement, with no sand fillers and no exposed glass fibers.
2. Resin used in tank and accessories shall be isophthalic polyester

**D. Tank Dimensions:**

1. Equalization tank

- A. The equalization tank shall have a nominal outside diameter of 8 feet.
- B. The equalization tank shall have an approximate overall length of 26 feet zero and one-half inches.
- C. The equalization tank shall be baffled at 2/3 volume with connecting PVC tees as shown in the drawings and shall have an access riser over the baffle for access to both sides of the baffle

2. Dosing tank

- A. The dosing tank shall have a nominal outside diameter of 8 feet.
- B. The dosing tank shall have an approximate overall length of fifteen feet zero and one-half inches.

**2.02 ACCESSORIES**

**A. Piping:**

1. Schedule 40 PVC or FRP pipe shall be used for inlet and outlet piping.
2. Inlets and outlets shall have PVC tees for baffles to prevent the sludge and scum layers from escaping from the tanks
3. All piping shall be factory sealed to enable field tightness testing with at least one piping opening provided with a threaded fitting for connecting a pressure test manifold.

**B. Access Openings:**

1. All access openings 24 inches in diameter or larger, shall be manufactured of FRP. The access riser shall be attached to the tank in such a manner to provide a watertight seal between the tank and the riser. The riser lids be fiberglass and shall have gaskets to prevent odors and shall have stainless steel bolts with hex-type (Allen) recessed heads and shall be countersunk into the fiberglass lid. The lids shall be securely fastened to prevent entry by unauthorized persons.
2. All access openings shall be factory sealed to enable field tightness testing.
3. Location(s) shall be shown on tank drawings.
4. Riser extensions shall be FRP or PVC securely attached to the tank access openings to provide a watertight seal. Risers may be attached to the tanks in the field. Riser lids shall be gasketed fiberglass or plastic capable of withstanding an H-20 wheel load and shall have secure bolt-down capability.

**C. Anchor Straps:**

1. Straps shall be FRP anchor straps as supplied by tank manufacturer.
2. Number and location of straps shall be shown on tank drawings.
3. Straps shall be securely fastened to dead men according to the manufacturer's installation instructions, and the dead men shall be of appropriate size and dimensions required to meet the manufacturer's specifications to prevent floating due to buoyant forces.

**D. Pumps:**

1. The equalization tank shall contain duplex Barnes Model SL 421 pumps with 4.25 inch diameter impellers, 230 Volt AC Single Phase motors capable of at least 42 gallons per minute at 15 feet total dynamic head.
3. The pumps shall be mounted on the Barnes stainless steel guide rail system supplied with the pumps.

**PART 3 - EQUALIZATION TANK**

Primary settled wastewater shall flow by gravity or be pumped to the pre-equalization tank (pre-EQ) located ahead of the Aquapoint supplied aerobic treatment system. The purpose of the pre-EQ shall be to transfer the wastewater to the treatment system over a



20 hour period at a consistent flow rate. Installation and assembly of the components shall be completed by the general contractor.

### 3.0 PRODUCTS

#### 3.01 MATERIALS

*make sure this is approved of RP*

- A. The pre-EQ system shall consist of a precast concrete tank (contractor supplied) located after the primary settling tank(s). The following equipment shall be included in this tank: 2 submersible pumps with slide rail assemblies, associated piping, valving, controls and appurtenances. This system shall be capable of providing a 20 hour equalized flow to the treatment system. The control panel for this unit shall be labeled as "Pre-Equalization".
- B. This tank shall contain two alternating solids handling submersible sewage pumps that shall transfer primary Bioclere effluent to the treatment reactor at a rate that shall be set to approximately 20 gpm. It is recommended that the flow rate be measured periodically by the operator and adjusted as needed.

#### 3.02 CONTROLS

- A. The UL approved control panel shall be furnished with an audio and visual alarm for pump failure and tripped circuit breaker conditions, an exterior alarm silence button, and an on/off/test power/alarm toggle switch. Within the NEMA 4X enclosed fiberglass panel pump timers, relays, terminal strip, on/off/test switches, run lights, dosing pump alternator, circuit breakers and current sensors shall be provided. Three control float switches are located in the tank and govern the following functions
  - 1. Low level float: In the extended position this float switch shall create an open circuit and prevent operation of the pumps. When the circuit is closed the float switch shall activate the timer and alternate the pumps, transferring wastewater to the tertiary treatment reactor.
  - 2. Mid level float: A mid level float switch shall create a closed circuit and activate the lag pump. The two pumps shall draw down the liquid in the equalization tank until the mid level float realizes an open circuit. Upon this occurrence, a counter shall be triggered to alert the operator that a high level condition has occurred and that the timer "on" setting may need adjusting.
  - 3. High level float: The high level float switch shall activate the audio/visual alarm when the circuit is closed. This shall allow the operator to periodically test the high level alarm.

### 3.03 TIMER SETTINGS

3.03.1 The pre-EQ pumps shall be set for an "on/off" cycle between zero minutes and several hours using a timer in the control panel.

3.03.2 For example, if the pre-EQ pumps are set for **8 minutes on and 4 minutes off**, the maximum volume they will dose per day is: **20 gpm \* (8/12) minutes dosing \* 24 hours \* 60 minutes/hr = 19,200 gpd.**

### 3.04 MISCELLANEOUS

3.04.1 The pre-EQ pumps shall alternate between dosing cycles. However, if one pump fails the remaining pump will take over the failed pump's cycle and an audio/visual alarm will be activated.

### 3.05 EXECUTION

#### 3.05.1 INSTALLATION

- A. All materials and equipment shall be installed in a neat, workmanlike manner.
- B. Installation of the treatment equipment supplied by AQUAPOINT shall be in accordance with written instructions provided by the manufacturer or approved representative.

#### 3.06 CLEAN UP

- A. Prior to start-up and field-testing, foreign matter shall be removed from all treatment system tanks.

#### 3.07 FIELD TESTING

- A. The system shall be field-tested by an Aquapoint representative using clean fresh water prior to acceptance. The system shall be operated to test the efficiency of all components. All systems, controls, and sequences shall be operated and demonstrated to operate as approved. The contractor shall be responsible for all necessary temporary connections, testing equipment and utilities and shall provide and dispose (if necessary) of all water used.

### 4.0 EXECUTION

#### A. Testing and Installation:

1. Tank shall be tested and installed according to manufacturer's current Installation Manual and Operating Guidelines.

2. Prior to installation, a tank tightness test consisting of a 5 psi air pressure/soap test shall be performed on all 4, 6, 8 and 10 ft. diameter tanks per the tank testing procedure outlined in the manufacturer's Installation Manual and Operating Guidelines.

## 5.0 WARRANTY

A. Warranty shall be manufacturer's current standard limited warranty.

## SECTION 4.0

### WASTEWATER TREATMENT SYSTEM

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. The Package trickling filter unit and associated appurtenances for the wastewater treatment system. The treatment unit shall be provided having a nominal treatment capacity of 17,500 (seventeen thousand five hundred) gallons. The treatment systems shall include all pumps, piping, blowers, and the control panel (in an enclosure) required for complete functioning of the treatment system to treat a minimum of 16,000 gallons per day of settled sewage to a water quality of 30 mg/L BOD<sub>5</sub> and 30 mg/L Total Suspended Solids.

#### PART 2 - PRODUCTS

##### 2.01 Package treatment units

- A. The treatment system shall consist of one model 36/24 BioClere wastewater treatment unit manufactured by AquaPoint of New Bedford, MA

##### 2.02 BioClere Treatment System

###### A. General

1. The BioClere treatment system shall include a trickling filter situated over a final settling tank. The BioClere treatment system shall be delivered complete from the supplier and shall include: random PVC manufactured media, ventilation fan, dosing pumps, sludge return pumps, internal piping, wiring and controls for a complete operational treatment system. The trickling filter portion of the tank shall have fiberglass inner and outer skins with the cavity between filled with polyvinyl foam insulation. The remainder of the unit shall be constructed of FRP or plastic as recommended by the equipment manufacturer. All internal piping shall be Schedule 40 PVC plastic pipe. The BioClere unit shall withstand normal pressures from the interior hydrostatic load and from the soil and seasonal water table.

The design criteria are as follows:

<u>Settled influent characteristics</u>	<u>Required effluent</u>
Flow, 20,000 gpd	32,000
BOD <sub>5</sub> , ± 250 mg/L	No greater than 30 mg/L
CBOD <sub>5</sub> , ± 250 mg/L	No greater than 30 mg/L
TSS, ± 2500 mg/L	No greater than 30 mg/L
pH, 6-9 s.u.	6 - 9 s.u.
Ammonium, ±80 mg/L (as nitrogen)	No effluent limit at this time
TKN, ± 80 mg/L	No requirements at this time
Oil and Grease, ± 60 mg/L	No greater than 15 mg/L
Nitrate, nearly zero mg/L	No requirements at this time
Total Nitrogen, ± 80 mg/L	No requirements at this time

Fecal Coliform

10,000 MPN/100 mL

**B. Pre-Cast Mounting Pad**

1. The contractor shall be responsible for providing a pre-cast mounting pad upon which to set each BioClere vessel. The mounting pads shall be as shown on the plans

**C. Filter Media**

1. The PVC randomly packed filter media shall have a void ratio of greater than 95 percent. The media shall be resistant to ultraviolet radiation and resistant to a wide range of aqueous solutions, acids, alkalis, oxidizing agents, oils, fats and alcohols.

**D. Settling tank**

1. The settling tank shall be cone shaped and have 60 degree sloped sides to prevent the accumulation of biological and inorganic suspended solids and shall contain the necessary internal piping to prohibit short-circuiting of the wastewater

**E. Ventilation Fan**

1. The CSA approved ventilation fan shall be 115 VAC single phase, 60 Hz ball bearing fan with a minimum manufactured rated airflow rate of 240 cubic feet per minute. The fan shall have an aluminum housing and polycarbonate blade.

**F. Pumps**

1. Two alternating pumps and one recycle pump shall be supplied with each BioClere treatment unit and they shall be 200/230VAC single phase, 60 Hz stainless steel submersible pumps. All pumps shall have an internal high temperature shut off switch. Each pump shall be capable of 65 gpm at 21 ft. of head. Each pump shall be rated for intermittent or continuous duty when fully submerged between 0<sup>o</sup> – 55<sup>o</sup> C. The alternating dosing pumps shall be controlled such that when one pump fails the remaining will complete both dosing cycles

**G. Float Switches**

1. The CSA and UL approved low level 115 VAC, single phase, 60Hz float switches shall be installed to prevent the recycle pump from operating when water levels are abnormally low in the BioClere units (i.e. during primary tank pumping) The float switches shall be mercury-activated wide-angle switches.

**H. Power Supply**

1. Each BioClere treatment unit shall have a dedicated 30-amp, 208 VAC or 230VAC single phase, 60 Hz power supply.

**I. Control Panel**

1. The UL approved control panel shall be furnished with an audio and visual alarm for pump failure and tripped circuit breaker conditions, and exterior alarm

silence button, and an on/off/test power/alarm toggle switch. Within the NEMA 4X enclosed fiberglass panel pump timers, relays, terminal strip, on/off/test switches, run lights, dosing pump alternator, circuit breakers, and current sensors shall be provided. A dry contact shall be installed in each control panel so that a common Bioclere alarm may be wired to a convenient location.

**J. Wiring**

1. The Electrical Contractor shall complete the wiring between the BioClere control panel and the terminal strip within the Bioclere fan module meeting all local, state, and federal codes.
2. All fittings, connections, etc. shall be water proof and water tight construction. Ground terminals are provided in both the main panel and the terminal strip within the Bioclere fan module located on each unit.
3. Care shall be taken to match the wires between the control panel and the terminal strip within the Bioclere fan module located on each unit.

**K. Warranty**

- 1 All equipment provided shall be warranted against defects in material and workmanship for a period of one year from the date of installation.

**L. Spare Parts**

1. A recommended list of spare parts shall be detailed in the site specific Technical Manual that details the Installation, Operation, & Maintenance procedures. The site specific Technical Manual shall be provided by the manufacturer or supplier of the Bioclere treatment system.

**M. Services Provided**

1. AquaPoint or an approved (by the manufacturer) manufacturer's representative shall provide the following services. The general contractor shall install the Bioclere units and all related components
  - a. Provide onsite technical assistance for the handling and positioning of the Bioclere units the day of installation
  - b. Return to the site for testing/commissioning of the Bioclere units upon substantial completion of site work by the general contractor (backfill, piping, electrical, grading, etc.). AquaPoint shall install the randomly packed media and pumps into the Bioclere units. AquaPoint shall be available to train the operators and instruct the owners on Bioclere operation the day of testing/commissioning.
  - c. Remain accessible to the owner and/or operator for phone consultation.
  - d. Be available on a contract basis for additional site visits or consultation.

**2.03 Product Handling**

- A. All material and equipment shall be shipped, stored, handled, and installed in such a manner as not to degrade the quality, serviceability, or appearance. The BioClere units shall be stored outdoors in a secure location according to the manufacturer's recommendations. Loose-shipped items shall be stored in a clean, dry location free from precipitation and excess moisture.

#### 2.04 Installation

- A. All materials and equipment shall be installed in a neat, workmanlike manner
- B. Installation of the Bioclere treatment system and ancillary equipment supplied by AquaPoint shall be in accordance with written instructions provided by the manufacturer or approved (by the manufacturer) manufacturer's representative.
- C. The Bioclere and all applicable treatment units supplied by AquaPoint shall be installed with sufficient ballast to offset buoyant forces due to induced or high groundwater conditions.

#### 2.05 Cleanup

- A. Prior to start-up and field testing, all foreign matter shall be removed from the grease trap, septic (settling) tanks, pump stations and Bioclere unit.

#### 2.06 Field Testing

- A. The Bioclere treatment system shall be field tested using clean fresh water prior to acceptance. The system shall be operated to test the efficiency of all components. All systems, controls, and sequences shall be operated and demonstrated as operating as approved. The contractor shall perform all tests and shall be responsible for all necessary connections, testing equipment and utilities and shall provide and dispose (if necessary) of all water used. A factory trained representative shall be present for the testing.

#### 2.07. Prohibitions

- A. Organic solvents, fuel oils, paint thinners, photographic fluids, floor waxes and strippers, solutions containing copper compounds, cleaning agents containing quaternary ammonium chlorides and products containing compounds that are documented to inhibit biological growth should not be discharged to the sewage treatment system.

## SECTION 5.0

### SUBSURFACE DRIP IRRIGATION DISPERSAL SYSTEM

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. The dosing pumps and controls, the drip irrigation tubing and associated appurtenances for the wastewater dispersal system, and the control panel for the drip irrigation system.

#### PART 2 - PRODUCTS

##### 2.01 Pumps, pump vaults, and associated controls for the dosing pumps located in the dosing tank

- A. The pumps shall be duplex model 5031-0007, 230 Volt AC Single Phase 3/4 Hp, 7 stage turbine pumps. The pump power requirement is 230 VAC single phase, 7.5 FLA.  
A total of 4 pumps shall be supplied. Three of the pumps shall be installed in the dosing tank as shown on the plans, and the fourth pump shall be held as a reserve pump.
- B. Each pump shall be installed in a duplex Zoeller filtered effluent STEP vault in the dosing tank.
- C. The pump discharge assemblies shall be supplied by the manufacturer and shall include a check valve, union, shut off valve, and anti-siphon device for each pump discharge
- D. The pumps and vaults shall include appropriate floats to provide a high water alarm and lag pump start, a low water alarm, and a timer enable float mounted on a float tree supplied by the manufacturer with the pump vault.
- E. Watertight junction boxes for the pump controls and wiring supplied with cord grips and a gasketed bolt-down lid for each junction box, and a conduit seal.
- F. All pumps shall be installed in the dosing tank within the filtered pump vaults according to the manufacturer's instructions.
- G. Wiring for the pumps from the control panel to the junction boxes in the dosing tank shall be provided by the contractor and shall be placed inside conduit. All wiring and connections shall be rated for underground burial, and shall be of the appropriate size to prevent excessive voltage drop at Full Load Amperage.

##### 2.02 Drip tubing, head control box, and associated connections for the subsurface drip irrigation system

###### A. Drip Tubing

The dripline shall consist of nominal sized one-half inch linear low density polyethylene tubing, with turbulent flow, drip emitters bonded to the inside wall. The drip emitter flow passage shall be 0.032" x 0.045" square. The tubing shall have an outside diameter (O.D.) of approximately .64-inches and an inside diameter (I.D.) of approximately .55-inches. The tubing shall consist of three layers; the inside layer shall be a Ultra Fresh protection, the middle layer shall



be black and the outside layer shall be purple striped for easy identification. The dripline shall have emitters regularly spaced 24" apart. The pressure compensating emitters shall be molded from virgin polyethylene resin with a silicone rubber diaphragm. The pressure compensating emitters shall have nominal discharge rates of 0.53 gallons per hour. The emitters shall be impregnated with Treflan® to inhibit root intrusion for a minimum period of ten years and shall be guaranteed by the manufacturer to inhibit root intrusion for this period. The 0.53 gph WASTEFLOW PC pressure compensating dripline shall be Geoflow model number WFPC16-2-24.

#### B. Head Control Boxes

1. Head Control boxes shall be provided on the outlet of each duplex pump system. The head control boxes shall be provided by the manufacturer complete with all components and wiring to be installed in place. The head control box shall be supplied with the appropriately sized riser with lid or meter box with lid to contain all of the components and to allow adequate room for removal of or servicing the components.
2. Each head control box shall contain a 2" API vortex filter, solenoids to provide filter flush and field flush, and appropriate piping and fitting to make all connections within the head control box.

#### C. Connectors

1. All connections shall be supplied by GeoFlow to make the connections between the PVC supply and return manifolds and the drip tubing. Flexible PVC loops shall be provided as shown on the plans where loops are made in the irrigation tubing layout.

### 2.03 Control panel to control and monitor the pump cycles and flows, the field flushing cycles and flows, and the filter flushing cycles and flows.

#### A. Control Panel Functions

1. The control panel shall contain a programmable logic controller with appropriate motor starters, relays, timers, audio/visual alarms, and displays to provide the following functions:
  - A. Operate all dosing pumps in a duplex alternating mode with 4 pumps normally running simultaneously. The programmable logic controller(s) shall be capable of programming each of the four duplex pump systems such that their dosing times and frequencies can be set for each of the duplex systems independently.
  - B. Provide for dosing cycles ranging in duration from 3 minutes to one hour and ranging in frequency from once every 15 minutes up to once every 4 hours with continuously selectable durations and dosing frequencies. Each duplex pump system shall be capable of being set with different dosing times and frequencies.

**Soil Analysis for Drip Irrigation Sewage Disposal**  
**Sloan Estates Subdivision - Washington County, Arkansas**

The soils at this site are dominantly FaC2 Fayetteville fine sandy loam. They have a fine sandy loam surface and a sandy clay loam subsurface. Loading rates are based on ADH Drip Irrigation Guidelines.

PIT # 1  
 BSWT 22 inches (chroma >3)  
 DEPTH > 50 inches  
 LOADING RATE 0.451 gpd/sq.ft.  
 COMMENTS:

PIT # 2  
 BSWT 29 inches (chroma 3)  
 MSWT 38 inches (chroma 2)  
 AMSWT 35 inches  
 DEPTH > 50 inches  
 LOADING RATE 0.239 gpd/sq.ft.  
 COMMENTS:

PIT # 3  
 BSWT 22 inches (chroma 3)  
 MSWT 34 inches (chroma 2)  
 AMSWT 30 inches  
 DEPTH > 50 inches  
 LOADING RATE 0.205 gpd/sq.ft.  
 COMMENTS:

PIT # 4  
 BSWT 17 inches (chroma >3)  
 MSWT 20 inches (chroma 2)  
 AMSWT 19 inches  
 DEPTH > 50 inches  
 LOADING RATE 0.13 gpd/sq.ft.  
 COMMENTS:

PIT # 5  
 BSWT 21 inches (FeMn)  
 MSWT 32 inches (chroma 2)  
 AMSWT 28 inches  
 DEPTH > 50 inches  
 LOADING RATE 0.191 gpd/sq.ft.  
 COMMENTS:

PIT # 6  
 BSWT 19 inches (chroma >3)  
 MSWT 25 inches (chroma 2)  
 AMSWT 23 inches  
 DEPTH > 50 inches  
 LOADING RATE 0.157 gpd/sq.ft.  
 COMMENTS: EB Transitional horizon

PIT # 7  
 BSWT 25 inches (chroma >3)  
 MSWT 27 inches (chroma 2)  
 AMSWT 26 inches  
 DEPTH > 50 inches  
 LOADING RATE 0.178 gpd/sq.ft.  
 COMMENTS:

PIT # 8  
 BSWT at surface  
 DEPTH > 50 inches  
 LOADING RATE n/a gpd/sq.ft.  
 COMMENTS:

PIT # 9  
 BSWT 28 inches (chroma >3)  
 DEPTH > 50 inches  
 LOADING RATE 0.574 gpd/sq.ft.  
 COMMENTS:

PIT # 10  
 BSWT 23 inches (chroma >3)  
 DEPTH > 45 inches  
 LOADING RATE 0.472 gpd/sq.ft.  
 COMMENTS:

PIT # 11  
 BSWT 22 inches (FeMn)  
 DEPTH > 50 inches  
 LOADING RATE 0.451 gpd/sq.ft.  
 COMMENTS:

PIT # 12  
 BSWT 22 inches (chroma 3)  
 MSWT 30 inches (chroma 2)  
 AMSWT 27 inches  
 DEPTH > 50 inches  
 LOADING RATE 0.185 gpd/sq.ft.  
 COMMENTS:

PIT # 13  
 BSWT 23 inches (chroma 3)  
 MSWT 33 inches (chroma 2)  
 AMSWT 30 inches  
 DEPTH > 50 inches  
 LOADING RATE 0.205 gpd/sq.ft.  
 COMMENTS:

**Soil Analysis for Drip Irrigation Sewage Disposal  
Sloan Estates Subdivision - Washington County, Arkansas**

PIT # 14  
BSWT 21 inches (chroma >3)  
MSWT 27 inches (chroma 2)  
AMSWT 25 inches  
DEPTH > 50 inches  
LOADING RATE 0.171 gpd/sq.ft.  
COMMENTS:

PIT # 15  
BSWT 25 inches (chroma >3)  
MSWT 30 inches (chroma 2)  
AMSWT 28 inches  
DEPTH > 50 inches  
LOADING RATE 0.191 gpd/sq.ft.  
COMMENTS:

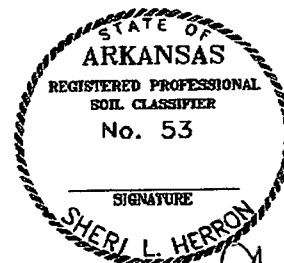
PIT # 16  
BSWT 20 inches (chroma >3)  
MSWT 28 inches (chroma 2)  
AMSWT 25 inches  
DEPTH > 50 inches  
LOADING RATE 0.171 gpd/sq.ft.  
COMMENTS: irregular boundary

PIT # 17  
BSWT 15 inches (chroma >3)  
MSWT 20 inches (chroma 2)  
AMSWT 18 inches  
DEPTH > 50 inches  
LOADING RATE 0.123 gpd/sq.ft.  
COMMENTS:

PIT # 18  
BSWT 19 inches (chroma >3)  
MSWT 22 inches (chroma 2)  
AMSWT 21 inches  
DEPTH > 50 inches  
LOADING RATE 0.144 gpd/sq.ft.  
COMMENTS:

PIT # 19  
BSWT 14 inches (chroma >3)  
MSWT 21 inches (chroma 2)  
AMSWT 19 inches  
DEPTH > 50 inches  
LOADING RATE 0.13 gpd/sq.ft.  
COMMENTS: irregular boundary

PIT # 20  
BSWT 18 inches (chroma = 3)  
DEPTH > 50 inches  
LOADING RATE 0.369 gpd/sq.ft.  
COMMENTS: weathering sandstone causing discoloration



4.937/19  
289



**SURVEY DESCRIPTION:**

**A PART OF THE NE1/4 OF THE NE1/4 OF SECTION 32 AND A PART OF THE NW1/4 OF THE NW1/4 OF SECTION 33, ALL IN TOWNSHIP 17 NORTH, RANGE 29 WEST OF THE FIFTH PRINCIPAL MERIDIAN WASHINGTON COUNTY, ARKANSAS, MORE PARTICULARLY DESCRIBED AS FOLLOWS:**

**BEGINNING AT AN IRON PIN FOUND AT THE NORTHEAST CORNER OF SAID NE1/4 OF THE NE1/4 ALSO BEING A POINT ON THE CENTERLINE OF N. GULLEY ROAD; THENCE ALONG SAID CENTERLINE THE FOLLOWING FOURTEEN (14) COURSES: S87°09'52"E 66.41 FEET; S77°26'53"E 17.42 FEET; S84°42'36"E 54.51 FEET; S87°50'30"E 101.84 FEET; S84°59'01"E 39.32 FEET; S76°39'55"E 37.42 FEET; S59°59'39"E 34.49 FEET; S45°58'55"E 32.16 FEET; S31°08'45"E 41.26 FEET; S16°05'37"E 46.00 FEET; S03°49'12"E 44.69 FEET; S01°09'26"W 78.28 FEET; S02°00'16"W 314.30 FEET TO A FOUND COTTON SPINDLE; S01°23'01"W 60.00 FEET TO A FOUND COTTON SPINDLE; THENCE DEPARTING SAID CENTERLINE N87°29'55"W 588.80 FEET TO A FOUND IRON PIN; THENCE S44°11'13"W 399.50 FEET TO A FOUND IRON PIN; THENCE S03°31'50"W 117.15 FEET TO A FOUND IRON PIN; THENCE N83°33'28"W 556.57 FEET TO A FOUND IRON PIN; THENCE N02°30'12"E 793.81 FEET TO A FOUND IRON PIN; THENCE N87°27'53"W 330.00 FEET; THENCE N02°32'35"E 605.60 FEET TO A FOUND IRON PIN; THENCE S87°27'40"E 499.23 FEET TO A FENCSE POST; THENCE S04°13'14"W 396.11 FEET TO A FOUND IRON PIN; THENCE S87°30'38"E 265.38 FEET TO A FOUND IRON PIN; THENCE S87°31'07"E 569.91 FEET TO THE POINT OF BEGINNING, CONTAINING 32.14 ACRES, MORE OR LESS, SUBJECT TO ANY EASEMENTS, COVENANTS OR RESTRICTIONS OF RECORD OR FACT.**

TECHNICAL SPECIFICATIONS

FOR

SLOAN ESTATES  
WASTEWATER TREATMENT  
AND DISPERSAL SYSTEM  
FAYETTEVILLE, ARKANSAS

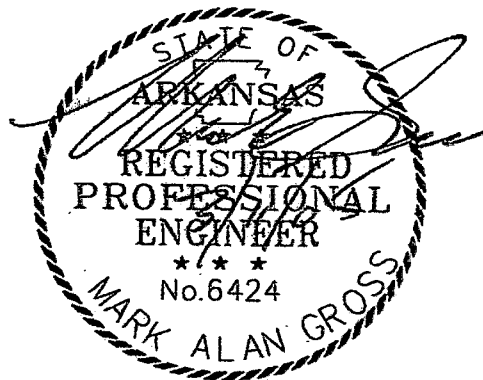
PREPARED BY

RURAL ENGINEERING SERVICES, INC.

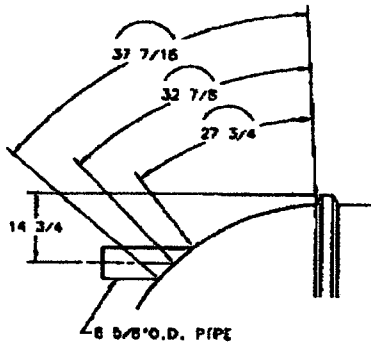
PREPARED FOR:

THE BARBER GROUP

FEBRUARY 28, 2005

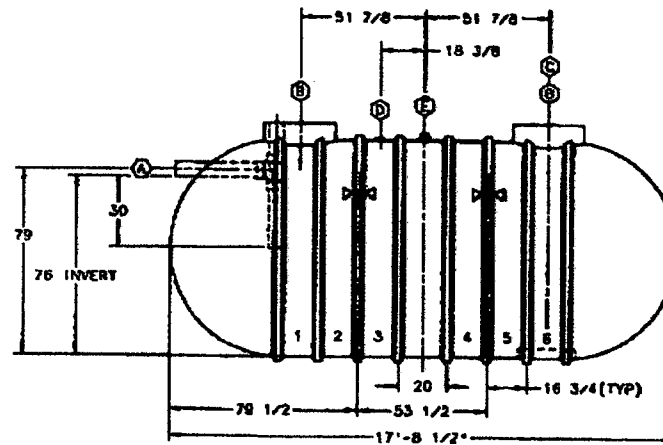


Included in this section of the WMP are the actual tanks which have been designed for this system and are included and shown in the plans for the treatment system. They have been signed by the engineer of record for the system, Mr. Mark Gross, PE.



PIPE LOCATION DETAIL  
SCALE: 1/12

NOTE:  
1 - SEE XERXES' ONE YEAR LIMITED WARRANTY FOR UNDERGROUND SEPTIC TANKS.  
2 - INVERT DIMENSION FROM TANK I.D.

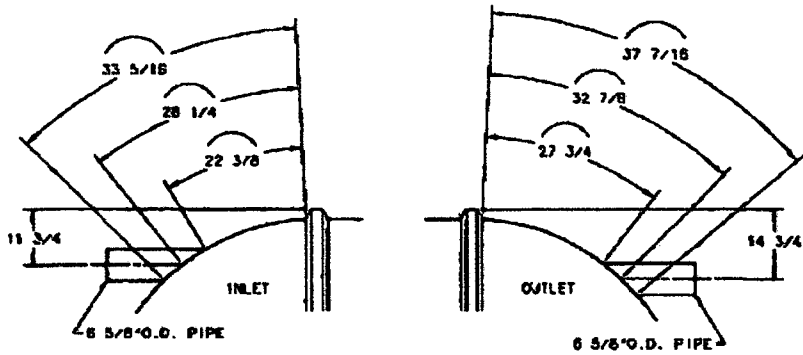


(A)	6" DIA SCH 40 PVC INLET PIPE WITH INTERNAL SANITARY TEE & PIPES
(B)	RISER PIPE, FOR 30" (NOMINAL) ACCESS OPENING
(C)	24" x 26" PUMP PLATFORM
(D)	2" NPT SERVICE FITTING
(E)	LIFTING LUG
(D)	HOLD DOWN STRAP LOCATION

CUSTOMER DESIGNATION: EQUALIZATION TANK

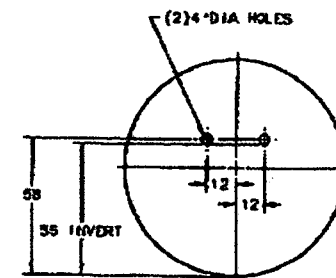
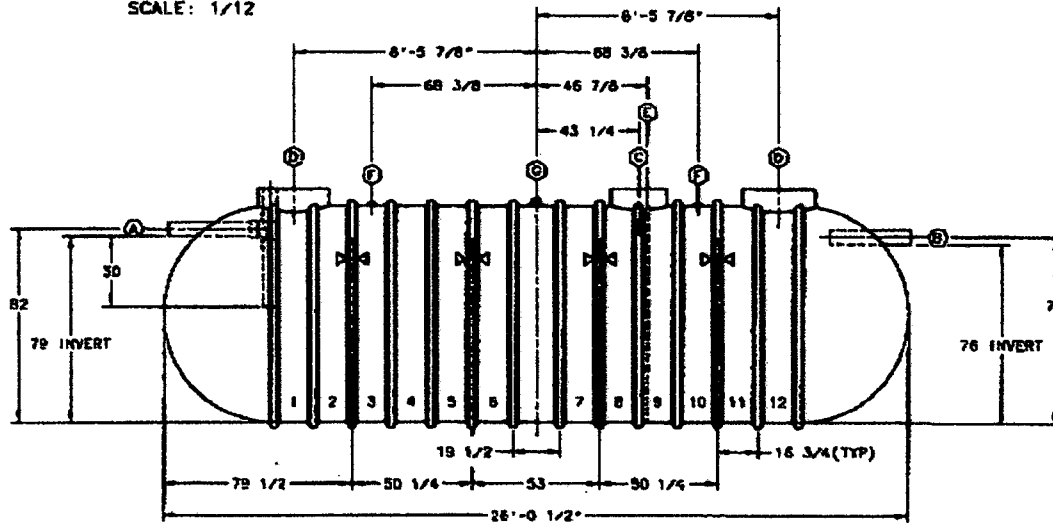
1	SEE EXISTING PLAN 80	DATE	BY
REV	DESCRIPTION	DATE	BY
<b>XERXES</b> CORPORATION			
8" DIA. SHT	8" DIA. SHT	CAP. 5,000 GALLONS	
24" x 26"	24" x 26"	SLOPE ESTIMATED	
626-537	01		





PIPE LOCATION DETAIL  
SCALE: 1/12

NOTE:  
1 - SEE XERXES' ONE YEAR LIMITED WARRANTY FOR UNDERGROUND SEPTIC TANKS.  
2 - INVERT DIMENSION FROM TANK I.D.



FULL BAFFLE DETAIL  
SCALE: 1/24

(A)	6" DIA SCH 40 PVC INLET PIPE WITH INTERNAL SANITARY TEE & PIPES
(B)	6" DIA SCH 40 PVC OUTLET PIPE
(C)	RISER PIPE, FOR 24" (NOMINAL) ACCESS OPENING
(D)	RISER PIPE, FOR 30" (NOMINAL) ACCESS OPENING
(E)	FULL PLATE BAFFLE (56" INVERT) WITH 2-4" DIA HOLES
(F)	2" NPT SERVICE FITTING
(G)	LIFTING LUG
(X)	HOLD DOWN STRAP LOCATION

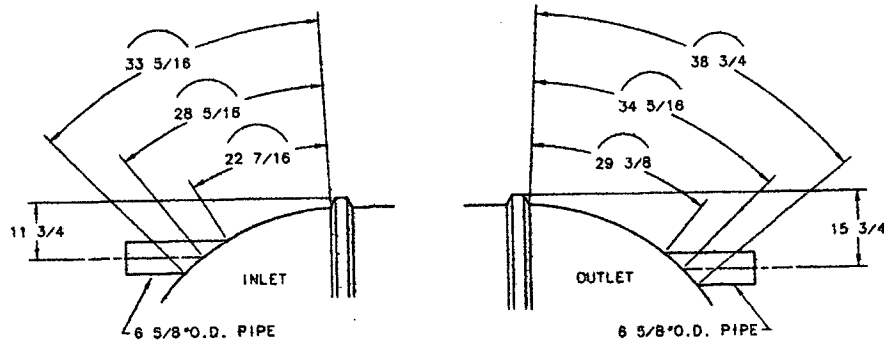
*Handwritten signature*

CUSTOMER DESIGNATION: SLUDGE / RECYCLE TANK

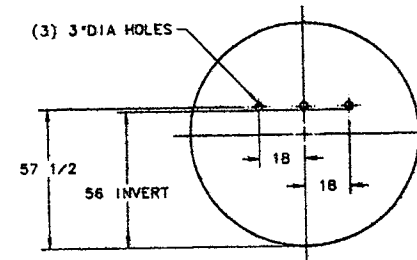
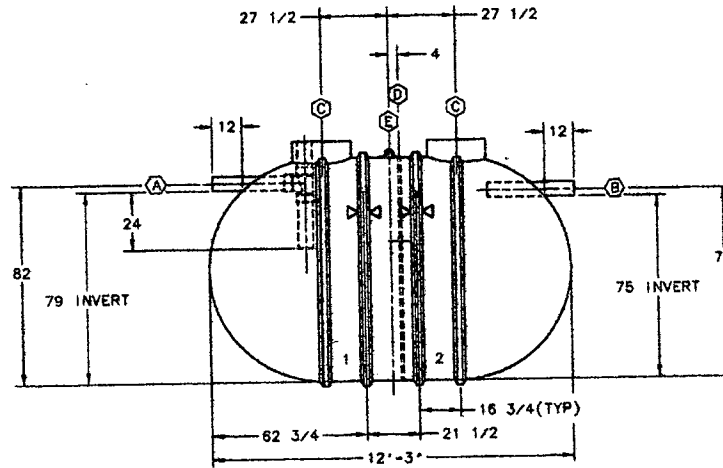
1		REVISED		DATE	
DATE	BY	DATE	BY	DATE	BY
<b>XERXES</b>					
CORPORATION					
6" DIA SBT CAP. 8,000 GALLONS SLOAN STATES					
D 626-538 01					

NOTE:

- 1 - SEE XERXES' ONE YEAR LIMITED WARRANTY FOR UNDERGROUND SEPTIC TANKS.
- 2 - INVERT DIMENSION FROM TANK I.D.



PIPE LOCATION DETAIL  
SCALE: 1/12



FULL BAFFLE DETAIL  
SCALE: 1/24

(A)	6\"/>
(B)	6\"/>
(C)	RISER PIPE, FOR 24\"/>
(D)	FULL PLATE BAFFLE (56\"/>
(E)	LIFTING LUG
(X)	HOLD DOWN STRAP LOCATION

*Mark Cross*

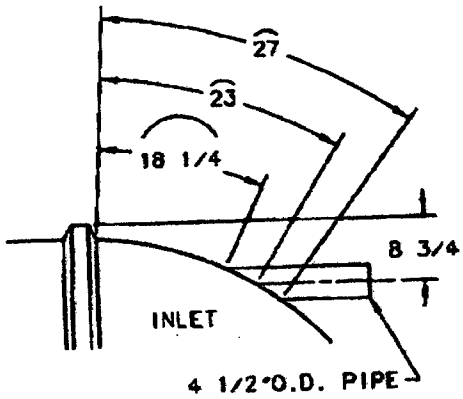
CUSTOMER DESIGNATION: SETTLING TANK

Q	REVISION	DESCRIPTION	DATE
1			
<b>XERXES</b> CORPORATION			
DSM	DATE	REV	BY
01	04-01-03	1	SM
02	05-10-03	2	SM
03	02-10-03	3	SM
CAP. 3,000 GALLONS		SLOAN ESTATES	
D 626-779		100	
SCALE: 1/2\"/>			

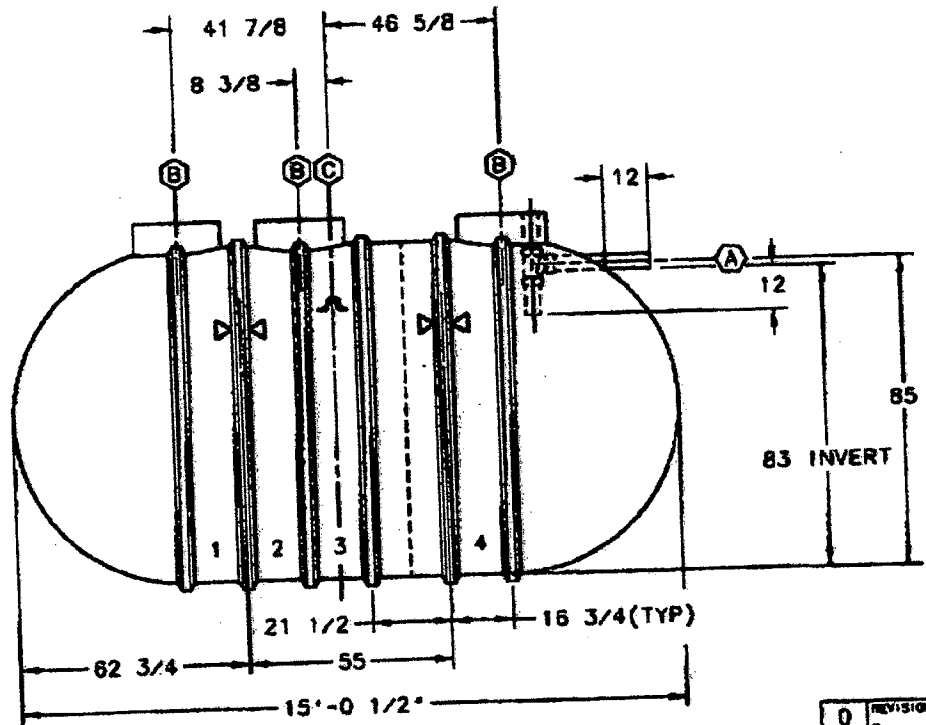
Signed by Mark Cross

NOTE:

- 1 - SEE XERXES' ONE YEAR LIMITED WARRANTY FOR UNDERGROUND SEPTIC TANKS.
- 2 - INVERT DIMENSION FROM TANK I.D.



PIPE LOCATION DETAIL  
SCALE: 1/12



(A)	4" DIA SCH 40 PVC INLET PIPE WITH INTERNAL SANITARY TEE & PIPES
(B)	RISER PIPE, FOR 24" (NOMINAL) ACCESS OPENING
(C)	LIFTING LUG (2 LUGS TOTAL) (1 EXTRA)
(X)	HOLD DOWN STRAP LOCATION

*[Handwritten signature]*

↑  
Mark  
GROSS PE

REVISION DESCRIPTION		BY	DATE
0			
<b>XERXES</b> CORPORATION			
8" DIA SWT		CAP. 4,000 GALLONS	
SLOAN ESTATES		C 626-741 00	
DATE	BY	NO. OF COPIES	REV.
7-28-05			
7-28-05			
7-28-05			

RURAL ENGINEERING SERVICES, INC.  
P.O. BOX 3189  
FAYETTEVILLE, AR 72702-3189

PDC Engineering  
Attn: Mr. Art Scott, P.E.  
130 North Main Street  
Cave Springs, AR 72718

23 December, 2005

Dear Mr. Scott:

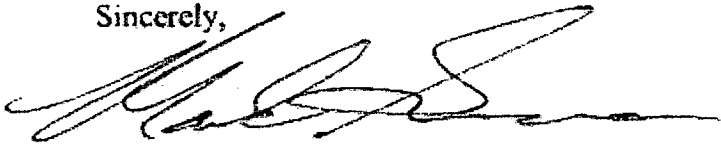
RE: Sloan Estates Wastewater Collection, Treatment and Dispersal System

I have coordinated the construction monitoring for the above referenced project with Richard Cantor of your office. The system has been completed in accordance with the construction plans and specifications. The construction looks good, and all that is left to do is to perform startup of the equipment.

This letter is to serve as the completion letter for the wastewater collection, treatment and dispersal system.

Thank you for the opportunity to work with you and PDC on this project.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark Gross', written over a horizontal line.

Mark Gross, Ph.D., P.E.

STATE OF ARKANSAS  
VIEW REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

HOME PAGE

<b>A</b>	1. Contractor Name & Number:	DRILLERS INC. (1196)
	2. Driller Name & Number:	CARL L. PETTY (2612)
	3. Pump Installer Name & Number:	UNKNOWN
	4. Date Well Completed: <u>03/09/1995</u>	New Well
5. COUNTY: <u>WASHINGTON (143)</u>		6 FRACTION <u>NE</u> ¼ of <u>SE</u> ¼ of 7 SECTION <u>32</u>
		8 TOWNSHIP <u>17N</u> 9 RANGE <u>29W</u>
11. LONGITUDE: <u>94-05-23</u> 11. LATITUDE <u>36-05-56</u>		

<b>B</b>	DEPTHS IN FEET				
		FROM	TO	WATER BEARING	IF YES.. DEPTH
	DESCRIPTION OF FORMATION				
	CL	<u>0.00</u>	11.00	No	
	LS	<u>11.00</u>	353.00	No	
SH	<u>353.00</u>	406.00	No		
SD	<u>406.00</u>	430.00	No		
1. DEPTH TO WATER		389			FT
2. TOTAL DEPTH OF WELL		<u>430.00</u>			
3. STATIC WATER LEVEL		<u>80.00</u> Ft. below land surface			
4. YIELD		<u>6</u> gallons per Y			
5. DIAMETER OF BORE HOLE		<u>6.12</u> IN			
<b>C</b>	PUMP REPORT				
1 TYPE PUMP					
2 SETTING DEPTH: <u>0.00</u> FEET					
3 BRAND NAME AND SERIAL NUMBERS:					
4 RATED CAPACITY <u>0.00</u>					
5 TYPE LUBRICATION					
6 DROP PIPE OR COLUMN PIPE SIZE					
7 WIRE SIZE:					
8 PRESSURE TANK: SIZE: MAKE: MODEL:					
9 DATE OF INSTALLATION OR REPAIR					
10 Is there an abandoned water well on the property? <u>No</u>					

<b>D</b>	CASING FROM TO W/ CASING FROM <u>0.00</u> TO <u>30.00</u> W/ <u>6.25</u> ID TYPE CASING <u>STEEL</u>
3. SCREEN	
TYPE: DIA SLOT/GA	
SET FROM FT TO FT	
TYPE: DIA SLOT/GA	
SET FROM FT TO FT	
4. GRAVEL PACK FROM: FT TO: FT	
5. BACK FILLED WITH: <u>cuttings</u> FROM: <u>0.00</u> FT TO: <u>10.00</u> FT	
6. SEALED WITH: <u>CEMENT</u> FROM: <u>10.00</u> FT FT TO: <u>30.00</u> FT 6. SEALED WITH: FROM: FT TO: FT FROM: FT TO: FT	
7. DISINFECTED WITH: <u>CLOROX</u>	
8. USE OF WELL: DOMESTIC	
9. A/C HEATPUMP TYPE WELLS	
(For A/C only) Will system also be used for purposes other than Heating and Air Conditioning? <u>No</u>	
(For A/C open-loop only) Into what medium is water returned?	
11. REMARKS	
12. SIGNED	DATE

STATE OF ARKANSAS  
VIEW REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

HOME PAGE

<b>A</b>	1. Contractor Name & Number:		SUMMERS WELL DRILLING (1454)	
	2. Driller Name & Number:		RICK BRADBURY (2134)	
	3. Pump Installer Name & Number:		UNKNOWN	
	4. Date Well Completed: <u>06/21/2006</u>		New Well	
5. COUNTY: <u>WASHINGTON (143)</u>			6 FRACTION $\frac{1}{4}$ of $\frac{1}{4}$ of 7 SECTION <u>17N</u>	8 TOWNSHIP <u>34</u> 9 RANGE <u>29W</u>
11. LONGITUDE: <u>94-04-00</u> 11. LATITUDE <u>36-05-52</u>				

<b>B</b>	DEPTHS IN FEET		WATER BEARING	IF YES.. DEPTH
	FROM	TO		
DESCRIPTION OF FORMATION				
NONE				
1. DEPTH TO WATER		280	FT	
2. TOTAL DEPTH OF WELL <u>550.00</u>				
3. STATIC WATER LEVEL <u>260.00</u> Ft. below land surface				
4. YIELD <u>2</u> gallons per <u>Y</u>				
5. DIAMETER OF BORE HOLE				
<b>C</b>	PUMP REPORT			
	1 TYPE PUMP			
	2 SETTING DEPTH: <u>0.00</u> FEET			
	3 BRAND NAME AND SERIAL NUMBERS:			
	4 RATED CAPACITY <u>0.00</u>			
	5 TYPE LUBRICATION			
	6 DROP PIPE OR COLUMN PIPE SIZE			
	7 WIRE SIZE:			
	8 PRESSURE TANK: SIZE: MAKE: MODEL:			
	9 DATE OF INSTALLATION OR REPAIR			
10 Is there an abandoned water well on the property? <u>No</u>				

<b>D</b>	CASING FROM TO W/ CASING FROM TO <u>62.00</u> W/ TYPE CASING <u>STEEL</u>	
3. SCREEN		
TYPE: DIA SLOT/GA		
SET FROM FT TO FT		
TYPE: DIA SLOT/GA		
SET FROM FT TO FT		
4. GRAVEL PACK FROM: FT TO: FT		
5. BACK FILLED WITH: <u>CUTTINGS</u>		
FROM: <u>57.00</u> FT TO: <u>0.00</u> FT		
6. SEALED WITH: <u>CEMENT</u>		
FROM: <u>62.00</u> FT FT TO: <u>57.00</u> FT 6. SEALED WITH:		
FROM: FT TO: FT FROM: FT TO: FT		
7. DISINFECTED WITH: <u>CLOROX</u>		
8. USE OF WELL:		
9. A/C HEATPUMP TYPE WELLS		
(For A/C only) Will system also be used for purposes other than Heating and Air Conditioning?		
No		
(For A/C open-loop only) Into what medium is water returned?		
11. REMARKS		
12. SIGNED		DATE

STATE OF ARKANSAS  
VIEW REPORT ON WATER WELL CONSTRUCTION & PUMP INSTALLATION

HOME PAGE

<b>A</b>	1. Contractor Name & Number:		DRILLERS INC. (1196)	
	2. Driller Name & Number:		SAMUEL L. HARMON (2457)	
	3. Pump Installer Name & Number:		UNKNOWN	
	4. Date Well Completed: <u>06/14/1999</u>		New Well	
5. COUNTY: <u>WASHINGTON (143)</u>			6 FRACTION $\frac{1}{4}$ of $\frac{1}{4}$ of	8 TOWNSHIP <u>33</u>
			7 SECTION <u>17N</u>	9 RANGE <u>29W</u>
11. LONGITUDE: <u>94-05-03</u> 11. LATITUDE <u>36-06-27</u>				

<b>B</b>	DEPTHS IN FEET		WATER BEARING	IF YES, DEPTH	
	FROM	TO			
	CL/GRV	<u>0.00</u>	16.00	No	
	SH	<u>16.00</u>	277.00	No	
	LS	<u>277.00</u>	622.00	No	
SH	<u>622.00</u>	655.00	No		
1. DEPTH TO WATER		530		FT	
2. TOTAL DEPTH OF WELL <u>655.00</u>					
3. STATIC WATER LEVEL <u>480.00</u> Ft. below land surface					
4. YIELD <u>2</u> gallons per Y					
5. DIAMETER OF BORE HOLE <u>6.12</u> IN					
<b>C</b> PUMP REPORT					
1 TYPE PUMP					
2 SETTING DEPTH: <u>0.00</u> FEET					
3 BRAND NAME AND SERIAL NUMBERS:					
4 RATED CAPACITY <u>0.00</u>					
5 TYPE LUBRICATION					
6 DROP PIPE OR COLUMN PIPE SIZE					
7 WIRE SIZE:					
8 PRESSURE TANK: SIZE: MAKE: MODEL:					
9 DATE OF INSTALLATION OR REPAIR					
10 Is there an abandoned water well on the property? <u>No</u>					

<b>D</b>	CASING FROM <u>0.00</u> TO <u>105.00</u> W/ <u>6.25</u> ID CASING FROM <u>105.00</u> TO <u>156.00</u> W/ <u>6.25</u> ID TYPE CASING <u>6.625, 11 POUND STEEL</u>
3. SCREEN	
TYPE: DIA SLOT/GA	
SET FROM FT TO FT	
TYPE: DIA SLOT/GA	
SET FROM FT TO FT	
4. GRAVEL PACK FROM: FT TO: FT	
5. BACK FILLED WITH: <u>CUTTINGS</u> FROM: <u>0.00</u> FT TO: <u>85.00</u> FT	
6. SEALED WITH: <u>PORTLAND CEMENT</u> FROM: <u>85.00</u> FT FT TO: <u>105.00</u> FT 6. SEALED WITH: FROM: FT TO: FT FROM: FT TO: FT	
7. DISINFECTED WITH: <u>CLOROX</u>	
8. USE OF WELL: DOMESTIC	
9. A/C HEATPUMP TYPE WELLS	
(For A/C only) Will system also be used for purposes other than Heating and Air Conditioning? No	
(For A/C open-loop only) Into what medium is water returned?	
11. REMARKS	
12. SIGNED	DATE



# AquaTech Systems

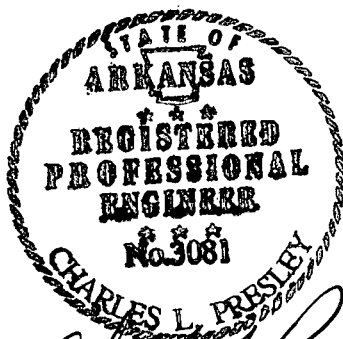
DECENTRALIZED WASTEWATER SYSTEMS

## WASTEWATER TREATMENT SYSTEM

## OPERATIONS AND MAINTENANCE MANUAL

Project Name: SLOAN ESTATES SUBDIVISION

Site Location: 5088 E Sagely Lane  
Fayetteville AR 72703



*Charles L. Presley*  
7/31/13



State Permitted Facility  
 Operation & Maintenance (O&M) Expense Estimate

Date: 07/01/2013

For: SLOAN ESTATES POA  
 Sloan Estates Subdivision

O&M Expense Categories	Units/Year	Unit Cost	Annual Cost	5-Year Cost <sup>1</sup>
<b>Operating Expenses</b>				
Operating Labor <sup>2</sup>	12	300.00	3600	19,080.00
Electricity <sup>3</sup>	12	125.00	1500.00	7950.00
Supplies & Chemicals	6	100.00	600.00	3,180.00
Analytical Testing	12	110.00	1320.00	6,996.00
Generator Fuel				
<b>Maintenance Expenses</b>				
Maintenance Labor <sup>2</sup>				3,000.00 sludge removal
Parts & Supplies				600.00 Pump Replacement
Building Materials				
<b>Administrative Expenses</b>				
Administrative Labor <sup>2</sup>				
Customer Fee Collection				
Insurance & Bonding				
Consulting & Legal Fees				
Interest Expenses				
Property Taxes				
Permit Fees			500.00	2,650.00
<b>Other Miscellaneous Expenses</b>				
<b>TOTAL</b>				43,456.00

**Notes:**

- 1 Assuming no inflation data are available, assume an inflation rate of 3% in years two through five and multiply the annual cost by 5.3 to estimate the five-year cost.
- 2 Labor costs must include fringe benefits and payroll taxes.
- 3 For existing facilities, include historical data if they are representative of future operations. For new facilities, show the electricity consumption calculations in kilowatt hours (kWh).

## **6.0 MAINTENANCE PROCEDURES**

### **6.1 BIOCLERE MAINTENANCE**

NOTE: Turn the main power switch to "OFF" before servicing the pump, fan or electrical panel box. The Aquapoint Field Service Report is provided to facilitate Bioclere maintenance and to provide a thorough check of Bioclere components.

Standard Quarterly Maintenance:

1. Check general condition/appearance of unit.
2. Check vent flow, odor.
3. Check general condition of fan box including internal and external wiring, lock, latch, gaskets, etc.
4. Check quiet fan operation.
5. Check condition of cover locks, latches, gaskets.
6. Check and characterize biomass.
7. Check recycle pump operation, timing, effluent clarity and spray pattern.
8. Check dosing pumps operation, timing, effluent clarity and spray pattern.
9. Check general condition of dosing assembly.
10. Check general condition of control box including locks, gaskets, etc.
11. Check control box switches, alarms, timers, etc.
12. Complete and maintain service report file.

### **6.2 Pre Equalization Tank:**

1. Check general condition/appearance of components.
2. Check and record high level counter in control panel.
3. Measure flow rate discharged by the pumps and adjust as necessary.
4. Check condition of junction box in the tank.
5. Check pumps, operation and timing.
6. Check condition of piping assembly in the tank.
7. Check condition and function of control panel.

See attached Equalization field report for complete O&M procedures

## 6.5 PROCESS CONTROL for NITROGEN REMOVAL with the BIOCLERE SYSTEM (if applicable):

Below is a brief description of how nitrogen removal is accomplished in the Bioclere units. Generally BOD removal occurs in the first stage Bioclere unit and a majority of nitrification in the second stage Bioclere. However, if the actual wastewater flow is less than the design flow, significant nitrification will occur in the first stage Bioclere unit.

### 6.5.1 Nitrification:

Nitrification is the sequential biological oxidation of  $\text{NH}_4\text{-N}$ , first to nitrite ( $\text{NO}_2\text{-N}$ ) by *Nitrosomonas* bacteria then to nitrate ( $\text{NO}_3\text{-N}$ ) by *Nitrobacter* bacteria according to the following overall equation:  $2\text{NH}_4^+ + 2\text{O}_2 \rightarrow \text{NO}_3^- + 2\text{H}^+ + \text{H}_2\text{O}$

Oxidation of 1 mg/l of  $\text{NH}_4\text{-N}$  requires approximately 4.6 mg/l of dissolved oxygen and produces acid resulting in the consumption of approximately 7.1 mg alkalinity as  $\text{CaCO}_3$ /mg  $\text{NH}_4\text{-N}$  oxidized. Alkalinity is the inorganic carbon source nitrifying bacteria required to oxidize ammonia. **Therefore it is critical that alkalinity is monitored on a regular basis to ensure complete nitrification.** Alkalinity concentrations in the Bioclere effluent must remain above 75 mg/l as  $\text{CaCO}_3$  to allow nitrification to proceed. If the alkalinity drops below this value, it is likely that nitrification will be inhibited and the effluent will not meet permit requirements. It is best to measure the alkalinity in the Bioclere effluent using a field test kit each time you are onsite to inspect the treatment system. Bioclere effluent can be collected from the final pump chamber or the sampling port that is located on top of the Bioclere unit (see the Bioclere general arrangement drawing located in Appendix A for the sampling port location). The sampling port is a 4" diameter PVC pipe that extends approximately 10' through the trickling filter to the effluent in the clarifier. Effluent can be collected with a bailer.

Alkalinity is generally added in the form of baking soda (sodium bicarbonate). It can be purchased as a powder in 50-pound bags. A solution can be mixed using the alkalinity mixing setup that has been included with the treatment equipment. Solution dosing is accomplished using a variable speed Masterflex chemical feed pump, which is controlled with a timer in the Bioclere control panel. Dosing should be set to run several minutes each hour. For a detailed description of the chemical feed installation and operational requirements refer to the site plans and **Appendix E** of this manual. Contact Aquapoint if assistance is required to determine the alkalinity-dosing rate.

Please note that nitrifying bacteria require a stable and consistent environment because of their sensitivity to numerous inhibitory and toxic substances and an array of environmental factors including temperature, pH, dissolved oxygen, and alkalinity. If nitrification is not being achieved then it will be necessary to verify the influent average daily flow, pH, BOD<sub>5</sub>, TSS, TKN. It may also be necessary to conduct an inventory of the type and quantity of any and all cleaning and process solutions that are used that may impact the microorganisms in the Bioclere units.

### 6.5.2 Denitrification:

Dissimilating denitrification, the biological reduction of nitrate ( $\text{NO}_3\text{-N}$ ) to nitrite ( $\text{NO}_2\text{-N}$ ) and ultimately nitrogen gas in an anoxic environment (dissolved oxygen  $<0.5$  mg/l), involves the transfer of electrons from a reduced electron donor (organic carbon substrate) to an oxidized electron acceptor ( $\text{NO}_3\text{-N}$ ). It is an important reaction as it restores approximately 3.57 mg alkalinity/mg of  $\text{NO}_3\text{-N}$  reduced, and partially offsets the effects of nitrification in a combined nitrification/denitrification process. The microorganisms responsible for completing the reaction are facultative heterotrophic aerobes contained in the wastewater that are also responsible for CBOD<sub>5</sub> oxidation in the Bioclere.

Denitrification in the Bioclere system is accomplished by periodically recirculating secondary sludge and treated nitrified effluent to the septic tank which provides an anoxic environment. Recirculation typically occurs several minutes every hour via a timer in the control panel. See **Section 2** of this manual for Bioclere recycle and dosing rates. For typical residential strength wastewater, recirculation of treated effluent from the Bioclere to the septic tank will achieve  $<12$  mg/l of total nitrogen. This is due to the fact that weight ratios of carbon to

#### 6.4 PROCESS CONTROL for CARBONACEOUS BIOCHEMICAL OXYGEN DEMAND (CBOD<sub>5</sub>) REMOVAL with the BIOCLERE SYSTEM:

Wastewater flows from the primary settling tank into a baffled chamber in the clarifier of the Bioclere. Dosing pumps located in this clarifier intermittently dose the PVC filter media bed with the wastewater.

In the Bioclere trickling filter the organic material in the wastewater is reduced by a population of microorganisms, which attach to the filter media and form a biological slime layer. Aerobic microorganisms accomplish treatment in the outer portion of the slime layer. As the microorganisms multiply the biological film thickens and diffused oxygen and organic substrate are consumed before penetrating the full depth of the slime layer. Consequently the biological film develops aerobic, anoxic and anaerobic zones.

Absent oxygen and a sufficient organic carbon source (CBOD<sub>5</sub>) the microorganisms near the media surface lose their ability to cling to the media. The wastewater flowing over the media washes the slime layer off the media and a new slime layer begins to form. This process of losing the slime layer is called "sloughing" and it is primarily a function of organic and hydraulic loading on the filter. This natural process allows a properly designed media bed to be self-purging and maintenance free.

The sloughed biomass settles to the bottom of the clarifier as sludge. This secondary sludge is periodically pumped back to the primary tank to enhance the digestion and denitrification processes, which is further discussed in *Section 6.3.2 below*.

##### 6.4.1 *Bioclere Trickling Filter Dosing Rates:*

The Bioclere uses two alternating dosing pumps to distribute wastewater over the trickling filter. It is critical to periodically clean the nozzles of excess biomass using a bottlebrush to ensure uniform distribution. The Bioclere dosing rates that were set at the time of commissioning are listed in *Section 2.0* of this manual. The dosing rates are set so that the flow of water and pollutants (CBOD<sub>5</sub> and ammonium) over the biofilm are maximized. This in turn, will maximize the pollutant removal efficiencies and facilitate biomass sloughing through the filter. Therefore, it is not necessary to adjust the dosing timers. In fact, the dosing timers should only be adjusted if the Bioclere receives little or no flow for extended periods.

##### 6.4.2 *Bioclere Recirculation Rates:*

Recirculation of sludge and treated effluent is accomplished in each unit using a submersible stainless steel pump controlled by a fully adjustable timer. The biological solids generated in the filter are returned to the sludge storage facility at regular intervals, typically every hour. Therefore, the sludge will not collect in the secondary settling tank and a sludge blanket will not form.

The benefits of sludge and treated effluent re-circulation are numerous and include: 1) removal of biological sludge from the Bioclere so that only the primary tank(s) need periodic pumping, 2) dilution of the influent pollutant concentrations, which results in a thinner and more effective biofilm on the media bed, 3) reduction or near elimination of odors in the primary tanks and the treatment components, 4) dilution of biological inhibitors (cleaning agent, sanitizers, etc.) that may exist in the wastewater, 5) attainment of nitrogen removal through denitrification due to the recirculation of nitrate to the primary tank.

The recirculation rates that were set at the time of commissioning are listed in *Section 2.0* of this manual. These rates may need adjusting depending on the 1) actual average daily flow, and 2) actual measured strength of the wastewater (concentrations of influent BOD<sub>5</sub>, TKN etc.). Please contact AQUAPOINT prior to adjusting the recirculation rates.

In a two stage Bioclere system the first unit is typically set to return only the biological sludge generated in the reduction of CBOD<sub>5</sub>. The second stage unit is set to run several minutes each hour to return biological sludge and treated effluent in order to maximize treatment efficiency.

nitrate, measured as **BOD:NO<sub>3</sub>-N** in the influent wastewater are usually greater than the generally accepted ratio of 2:4 in which denitrification has been proven to proceed without an external carbon source such as methanol.

However, many commercial applications will require a carbon source such as methanol. If required, a carbon dosing rate of approximately 3:1 (COD carbon source: NO<sub>3</sub> in wastewater) is required to complete denitrification.

Carbon is often added in the form of methanol or a 20% methanol solution. However many other organic carbon sources can be used including glucose (sugar), sodium acetate, soda syrup etc. If the carbon source is not purchased in pre-mixed drums, a solution can be made-up using the mixing setup that has been included with the treatment equipment. Carbon dosing is accomplished using a variable speed Masterflex chemical feed pump, which is controlled with a timer in the Bioclere control panel. Dosing should be set to run several minutes each hour. For a detailed description of the chemical feed installation and equipment operational requirements refer to the site plans and **Appendix E** of this manual. Contact Aquapoint if assistance is required to determine the carbon-dosing rate.

If the effluent dissolved oxygen concentrations from the anoxic reactor exceed 0.5 mg/l, denitrification may be inhibited. In isolated instances, this has been documented to occur during extreme cold weather periods. If this occurs, the Bioclere fan size can be reduced to compensate for the increased dissolved oxygen levels. If the condition persists, an oxygen scavenging agent can be dosed into the Post Equalization tank to uptake the residual dissolved oxygen. Please contact Aquapoint if this condition is experienced.

***How do I know when a carbon source is needed?***

You must monitor the nitrate in the septic tank effluent tee with a nitrate field test kit. When nitrate is consistently >3 mg/l in the septic tank effluent, it is necessary to add an organic carbon source to the influent side of the septic tank to achieve denitrification. You should also measure the dissolved oxygen. For denitrification to proceed a dissolved oxygen level of <0.5 mg/l is required in the septic tank effluent.

**AQUAPOINT****241 DUCHAINE BLVD.****NEW BEDFORD, MA 02745****TEL. 508 998-7577 / FAX. 508 998-7177****BIOCLERE FIELD REPORT**

Date:

Client:

Address:

Inspector:

Bioclere Model Number(s)

Installation:

Service:

Other:

Tested:

Commissioned:

Scheduled Maint.

1) Odor around site? Y / N, Source of odor?

Check all that apply:

Mild:

Med:

Strong:

Musty:

Septic:

2) Take influent/effluent samples as required.

Please fax analytical results to Aquapoint for review.

3) a) Measure sludge in primary tanks and grease traps as required:

b) Sludge depth in primary tank:

c) Does grease trap need pumping?

scum depth:

sludge depth:

Y / N

**UNIT 1****UNIT 2****4) BIOCLERE VENTS**

a) Is air passing through the vent?

If in doubt put a small plastic bag around vent and allow to fill

b) Is the fan operating and in good condition?

Y / N

Y / N

Y / N

Y / N

**5) GENERAL**

a) Any external damage to the unit(s)? If yes, then provide details on back

b) Are cover, fan box and control panel securely locked?

c) Any filter flies in the unit?

Location of flies:

Y/N few / many

Y/N few / many

d) Locks / Latches / Handles, OK?

e) Lid Gasket, OK?

f) Does the fan box contain standing water?

If yes, then remove water and clean drain holes if necessary.

Y / N

Y / N

Y / N

Y / N

Y / N

Y / N

**6) BIOMASS CHARACTERIZATION**

a) Color of biomass?

1)white 2)white/grey 3)grey 4)grey/brown 5)brown 6)red/brown 7)black 8)other

b) Thickness of biomass 6 - 12 inches below media surface

1) light 2) medium 3) heavy

**7) NOZZLE SPRAY PATTERN**

a) Does spray cover the entire surface area of media?

If not then clean each nozzle with a bottle brush

Does the spray now cover the entire surface area?

If not then:

1) remove nozzles and soak them in a bleach solution

2) manually engage both dosing pumps for 2 minutes

3) replace nozzles

Does the spray now cover the entire surface area?

If not then consult AQUAPOINT

Y / N

Y / N

Y / N

Y / N

Y / N

Y / N

**8) PUMPS AND CONTROL PANEL**

a) Record dosing and recycle pump timer settings from control panel

Dosing pump 1 and 2:

min on/ min off      min on/ min off

Recycle pump:

min on/ hrs off      min on/ hrs off

In Bioclere control panel set dosing and recycle timers to a test cycle:

a) Measure amperage of dosing pump 1:

amps      amps

b) Measure amperage of dosing pump 2:

amps      amps

c) Measure amperage of recycle pump:

amps      amps

Are the dosing pumps alternating?

Y / N      Y / N

Are the timers operating properly?

Y / N      Y / N

Visually inspect relays for wear and record problems below.

\*If replacement pumps or floats are needed contact Aquapoint, Inc.

Contact Arvin Associates at (508) 583-8221 for any control panel replacement part

If an ammeter is not available, set the timers to a test cycle as above and physically at the Bioclere, check the pumps operation as follows:

Dosing pumps: check that pump(s) are operating, alternating and the assigned rest cycle is occurring.

pump 1: OK? Y / N      pump 1: OK? Y / N

Recycle pump(s): check that pump(s) are operating and the designated rest cycle is occurring.

pump 2: OK? Y / N      pump 2: OK? Y / N

\*If pumps or control components are not operating properly record below and consult Aquapoint, Inc.

OK? Y / N      OK? Y / N

**RESET TIMERS TO ABOVE SETTINGS: Note any changes here:**

**\*Do not change timers without consulting Aquapoint**

min on/ min off      min on/ min off  
min on/ hrs off      min on/ hrs off

**9) PLUMBING**

a) Are the unions in the Bioclere leaking?

Y / N      Y / N

If yes then tighten with pipe wrench

**10) FINAL CHECK**

a) Main power "on" and toggle for all pumps set to "normal" position

Y / N      Y / N

b) Alarm toggle set to the "on" position

Y / N      Y / N

c) Lock control panel, Bioclere cover and fan box

d) If possible, record the water meter reading:

**11) REPORT SUMMARY:**

**SIGNATURE:**

<b>AQUAPOINT</b>		
<b>241 DUCHAINE BLVD.</b>		
<b>NEW BEDFORD, MA 02745</b>		
<b>TEL. 508 998-7577 / FAX. 508 998-7177</b>		
<b>PRE-EQUALIZATION TANK FIELD REPORT</b>		
Site:		
Date:		
Client:	Installation:	Tested:
Inspector:	Service:	Commissioned:
	Scheduled Maint:	Other:
<b>PRE-EQUALIZATION CONTROL PANEL</b>		
<b>1) PUMPS AND CONTROL PANEL</b>		
a) Record dosing pump timer setting from control panel. Dosing pump 1 and 2:		minutes on / minutes off
b) Record high float counter in control panel:		
In the Bioclere control panel set dosing timer to a test cycle (i.e. 0.5 min on 0.5 min off.)		
a) Measure amperage of dosing pump 1:		amps
b) Measure amperage of dosing pump 2:		amps
c) Measure amperage of mixing pump (if applicable):		amps
Are the dosing pumps alternating?	Y	N
Are the timers operating properly?	Y	N
Visually inspect relays for wear and record problems below.		
*If replacement pumps or floats are needed contact Aquapoint, Inc. Contact Arvin Associates (508) 583-8221 for any control panel replacement parts.		
If an ammeter is not available, set the timers to a test cycle as above and physically check the pumps operation as follows:		
Dosing pumps: check that pump(s) are operating, alternating and the designated rest cycle is occurring.	pump 1: OK?	Y / N
	pump 2: OK?	Y / N
*If pumps or control components are not operating properly record below and consult Aquapoint, Inc.		
<b>RESET TIMERS TO ORIGINAL SETTINGS:</b> Note any changes here:		min on / min off
*Do not change timers without consulting Aquapoint, Inc.		
<b>2) PLUMBING</b>		
a) Are the unions in the Equalization tank leaking? If yes then tighten with pipe wrench	Y	N



**3) FLOAT SWITCH OPERATION**

a) **LOW ALARM FLOAT** - In the extended position (open circuit) the float will activate an audio/visual alarm as well as act as a redundant low level pump shut off. In the closed position the float allows normal operation.

b) **LOW FLOAT** - In extended position (open circuit) float is a low level pump shut off  
- In closed position float activates Serfac timer and dosing cycle

c) **MIDDLE FLOAT** - In extended position (open circuit) float allows normal operation  
- In closed position float trips the counter and activates lag pump until tank is empty

d) **HIGH FLOAT** - In extended position (open circuit) float allows normal operation  
- In closed position float will activate the audio/visual alarm

**4) FLOW RATE MEASUREMENT (gpm)**

- Measure flow rate in (gpm) from tank by measuring the draw down volume over a specified time (i.e. 5 minutes)
- Refer to Bioclere Technical Manual for process description and maximum flow rate (gpm)
- Flow rate may be adjusted using the 2" brass ball valves in the tank

**5) FINAL CHECK**

- a) Main power "on" and toggle for pumps set to "normal" position Y / N
- b) Alarm toggle set to the "on" position Y / N
- c) Lock control panel Y / N
- d) If possible, record the water meter reading:

**6) REPORT SUMMARY**

**SIGNATURE:**

## 7.0 TROUBLE SHOOTING

7.1 Before conducting any repair work on the fan or pump, replacing fuses, or doing any work on the panel or fan module:

**SWITCH THE MAIN POWER PANEL SWITCH TO "OFF"** - and follow applicable "lock out", "tag out" procedures.

<u>FAULT</u>	<u>POSSIBLE CAUSE</u>	<u>CORRECTIVE ACTION</u>
Fan not working	Power failure	Check fuse and replace if necessary.
	Fan motor failure	Check wiring and terminal connections. Replace fan if necessary.
Dosing pump not working	Power failure	Check circuit breaker.
	Pump not submerged	Check that pump is fully submerged.
	Timer control failure.	Check that power switch is "ON". Replace timer if necessary.
Excessive build-up of biomass	Pump failure	Replace pump.
	Plant overload	Check that hydraulic and organic load are within design limits. Contact Aquapoint Inc. if capacity is to be increased.
	High sludge or grease levels in primary tanks.	Check sludge levels in each unit and de-sludge as necessary.
Elevated solids concentration in final effluent.	High sludge level in Bioclere sump.	Check pump and timer control. De-sludge by pumper if necessary.
	Excess shedding of biomass.	investigate and eliminate any source of biofilm poisoning such as disinfectant, household bleach, acids, etc. showing up in waste.
Odorous	Inefficient treatment.	Check that dosing assembly sprinkles evenly over media surface. Clean dosing assembly.
	Inadequate air supply	Check fan and air intake. See "fan not working" above.

<b><u>FAULT</u></b>	<b><u>POSSIBLE CAUSE</u></b>	<b><u>REMEDIAL ACTION</u></b>
	Primary tank clogged.	Check inlet and outlet pipes and sludge level. De-sludge as necessary.

## **8.0 FINAL EFFLUENT QUALITY PROBLEMS**

### **8.1 HIGH SUSPENDED SOLIDS.**

If effluent solids concentrations are exceeded, carry out the following checks:

1. Check operation of recycle pump from telltale near the top of the central shaft.
2. Examine primary settlement tank. If excessive sludge or floating matter in the chamber is discharging to the Bioclere arrange for the primary tank to be de-sludged. (See Section 2.6, 2.7)
3. If the sludge recycle pump has been out of operation for more than 8 weeks, the Bioclere sump should be de-sludged.

### **8.2 HIGH B.O.D. ( BIOCHEMICAL OXYGEN DEMAND)**

If effluent levels are exceeded carry out the following checks:

1. Check for signs of excessive sludge in the primary tanks. (See Section 2.6, 2.7)
2. Check that the fan is operating continuously and that the air inlet to the fan is unobstructed. Clean and replace as necessary.
3. Check that the dosing assembly is clean and that the effluent is being distributed evenly to the filter media.
4. Check whether the loading to the plant has increased beyond the design basis. Consult Aquapoint Inc. if loading has increased.
5. Ensure that there are no toxic or concentrated cleansing chemicals being discharged to the plant.

### **8.3 HIGH NH<sub>3</sub>N (AMMONIA-NITROGEN)**

Carry out check procedure as for Item 8.2 B.O.D.

For additional assistance contact:

**AQUAPOINT**  
241 Duchaine Blvd.  
New Bedford, MA 02745  
Tel. 508-998-7577  
Fax 508-998-7177

E-mail: [aquapoint@aquapoint.com](mailto:aquapoint@aquapoint.com)

**APPENDIX B**

**CONTROL PANEL FOR OPERATION**

**OF**

**BIOCLERE**

**Wastewater Treatment System**

## **BIOCLERE ELECTRICAL INFORMATION**

### 1. **ELECTRICAL SUPPLY REQUIREMENTS:**

- A. The control panel requires a separate 115/1/60 supply rated for 40 amps.
- B. The pre-equalization control panel requires a separate 115/1/60 supply rated for 45 amps.

### 2. **WIRING:**

A licensed electrical contractor is responsible for wiring to meet local, state and federal codes as applicable.

Grounds are provided in both the Bioclere main control panel and fan module which must be wired to earth ground.

All fittings, connections, etc. are to be weatherproof, watertight construction.

#12 wire is sufficient for all motor connections.

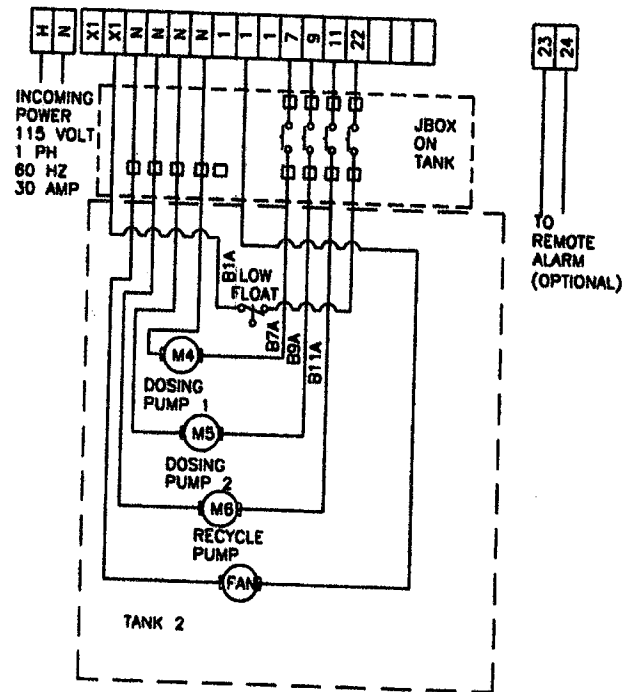
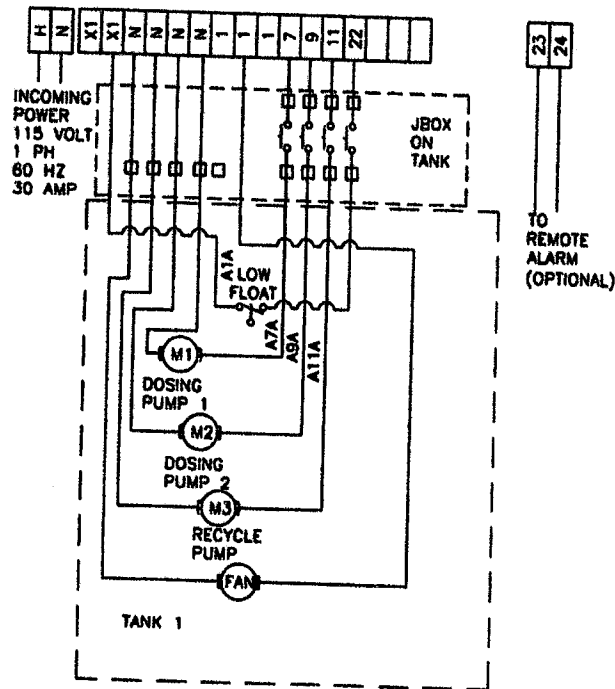
In the event more than one system is located in an enclosure, wire numbers are prefixed by AA≅ on the first system, "B" on the second, etc. Aquapoint would recommend care be taken not to mix wires between systems.

### 3. **OPERATION:**

- A. **Normal Operation:** The Bioclere unit will normally operate without any need for supervision. However, from time to time conditions may occur which activate the audible/visual alarms and require correction.
- B. **Alarms provided:** Each Bioclere system has a separate set of alarms which consist of a flasher light on top, and an "ON/OFF/TEST" switch on the front panel. The "ON/OFF/TEST" switch should always be in the "ON" position, otherwise the alarms are disabled. The "TEST" position is for test of the visual/audible alarms. The "OFF" position should only be used during servicing by authorized personnel.

NOTES:

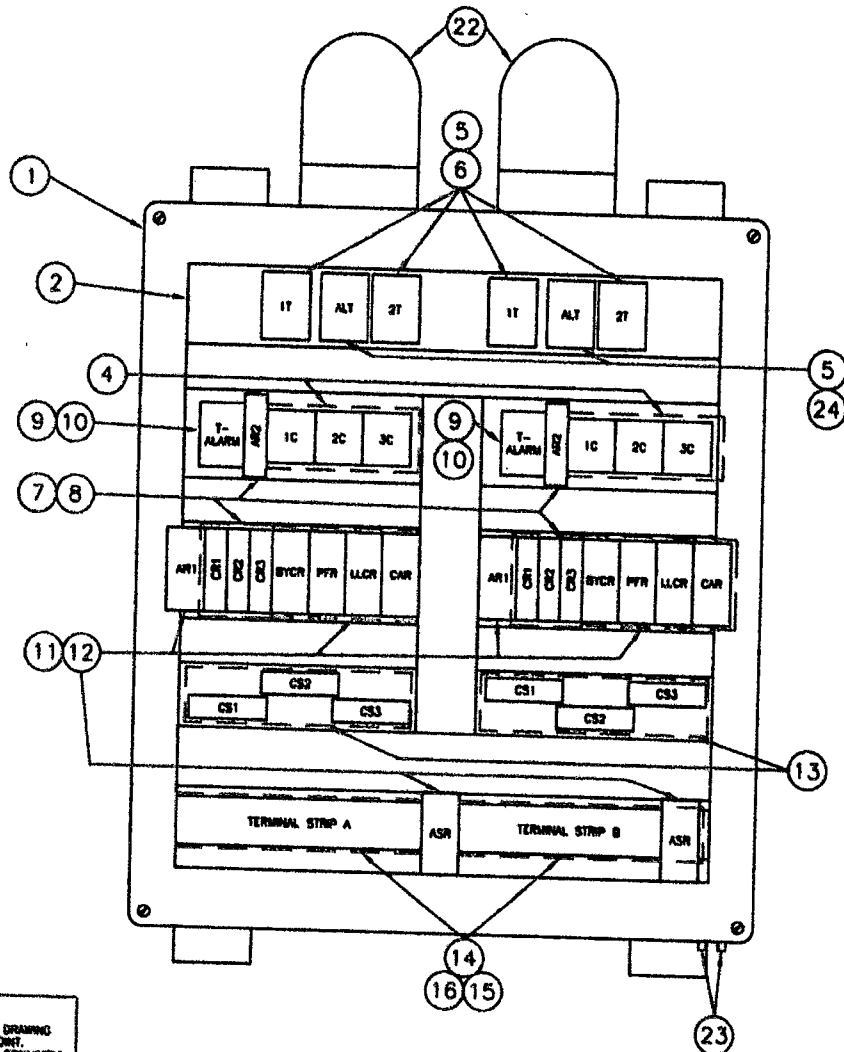
# EXTERNAL WIRING FOR CONTRACTORS



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<p><b>AquaPoint</b>  <small>Water Treatment Systems</small>          241 DUCHANE BLVD., NEW BEDFORD, MA 02745          (508) 998-7827 FAX (508) 998-7177</p>		<p>DATE: 02-11-02          DRAWN BY: [ ]          CHECKED BY: [ ]          APPROVED BY: [ ]          TITLE: [ ]</p>
<p>PROJECT: [ ]          DRAWING NO: [ ]          SHEET NO: [ ]</p>		<p>Customer: [ ]          Project: [ ]          Drawing No: <b>AWT3020</b>          Date: [ ]</p>

NOTES:



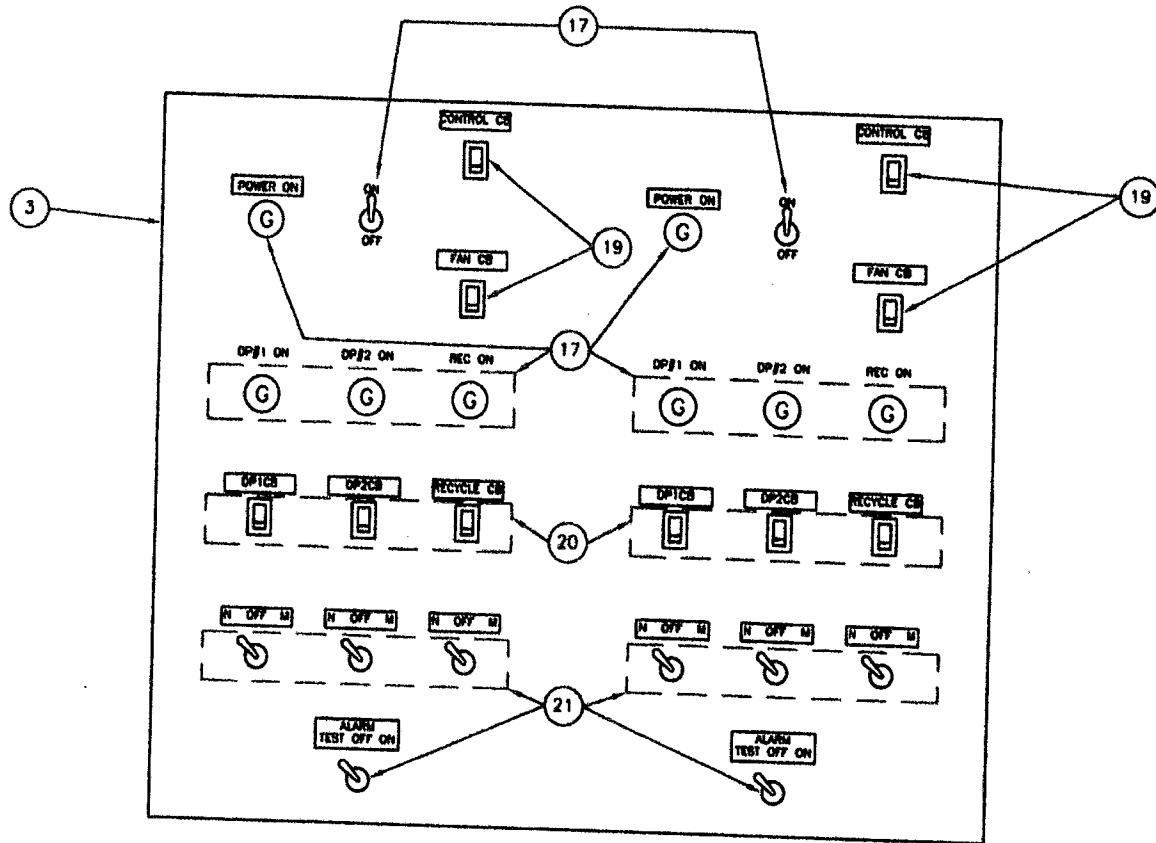
25	2	EATON	RECYCLE TOGGLES	7263RS
24	2	TRUMARK	ALTERNATOR	261D120
23	2	EATON	PUSHBUTTON SWITCH(SILENCE)	8444K4
22	2	PATLITE	ALARM BEACON/NORN	RHB-120VXL
21	8	11M	GREEN LIGHTS	10252QAS
20	8	POTTER&BRUNFIELD	15 AMP CIRCUIT BREAKERS	W28X01A-15
19	4	POTTER&BRUNFIELD	3 AMP CIRCUIT BREAKER	W28X01A-3
18	6	EATON	TOGGLE SWITCH(PUMPS & ALARM)	7503K15
17	2	POTTER&BRUNFIELD	MAIN CIRCUIT BREAKER	W31X2A1G30
16	4	ENTRELEC	GROUND TERMINALS	16511316
15	32	ENTRELEC	TERMINALS	11511607
14	4	ENTRELEC	TERMINALS(N, N)	11511611
13	8	OWENSPIED	CURRENT SENSORS	CM00100-20
12	12	IDEC	2 POLE RELAYS	RH2BLAC120
11	12	IDEC	2 POLE RELAY SOCKETS	SR2P-05
10	2	IDEC	TIMER	RT2P-05
9	2	IDEC	RELAY SOCKET 8 PIN	SR2P-06
8	8	IDEC	1 POLE RELAYS	RH1BMAC120
7	8	IDEC	1 POLE RELAY SOCKET	SR1B-05
6	4	GROUZEY	TIMERS, RECYCLE TYPE	PL2R
5	8	IDEC	RELAY SOCKET 11 PIN	SR3P-05
4	8	ALG	CONTACTORS	LS071040
3	1	MCKINSTRY	14/12 OPERATOR PANEL	42/1412
2	1	MCKINSTRY	24 X 20 BACKPANEL	42/2420
1	1	ROBERY	24 X 20 ENCLOSURE	N2420BHW
ITEM NO.	QTY	MANUFACTURE	DESCRIPTION	PART NO.

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Drawn: G. G. G. G.  
 Checked: D. D. D. D. AWT3020  
 Date: 10/1/74

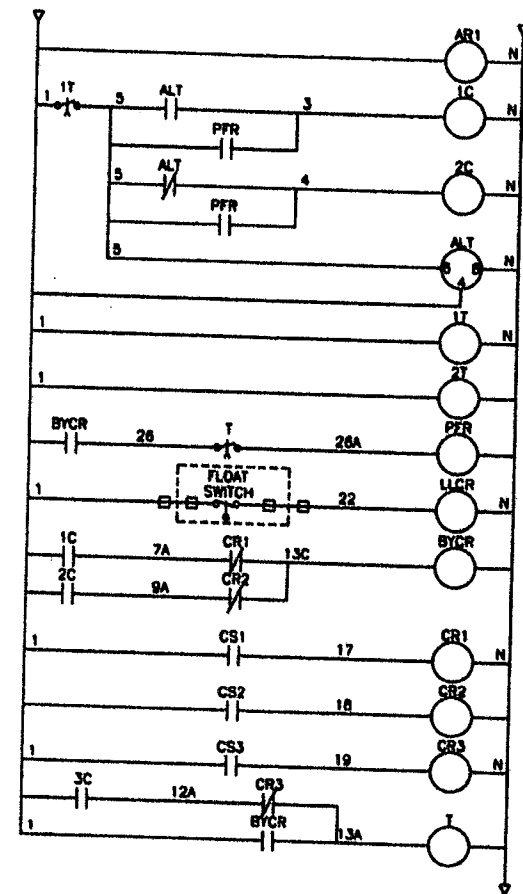
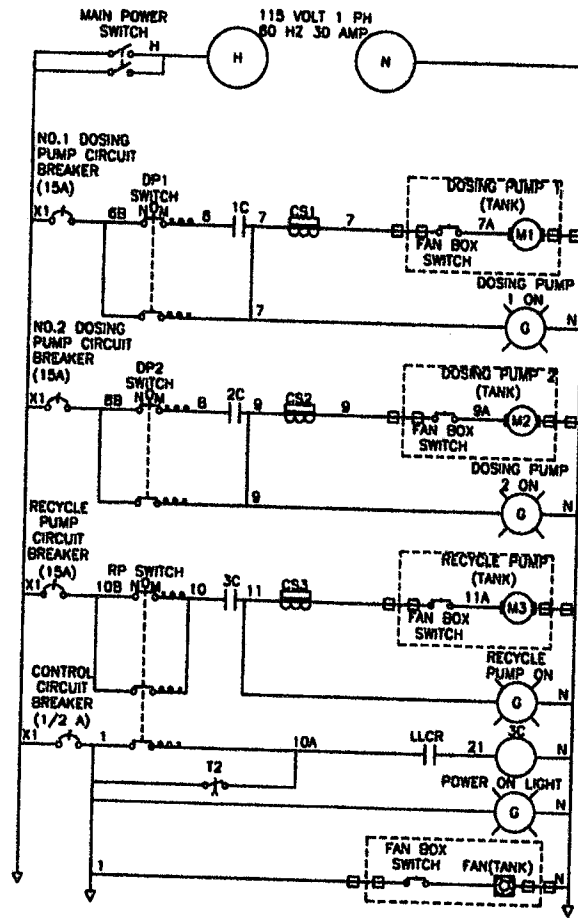


NOTES:



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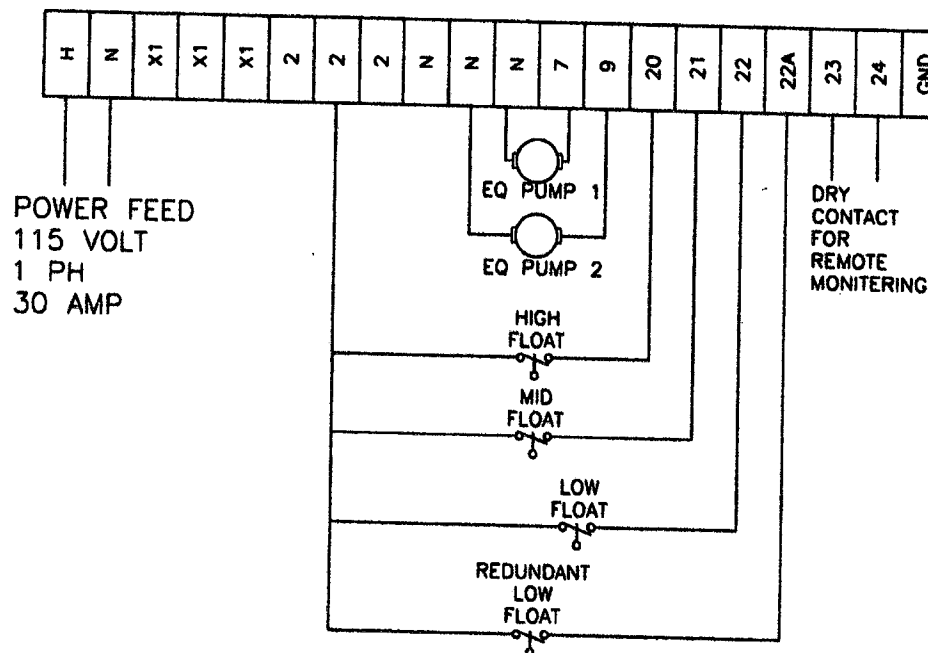
WIRE EACH SIDE, PREFIX WIRE NUMBERS WITH SIDE (A OR B)



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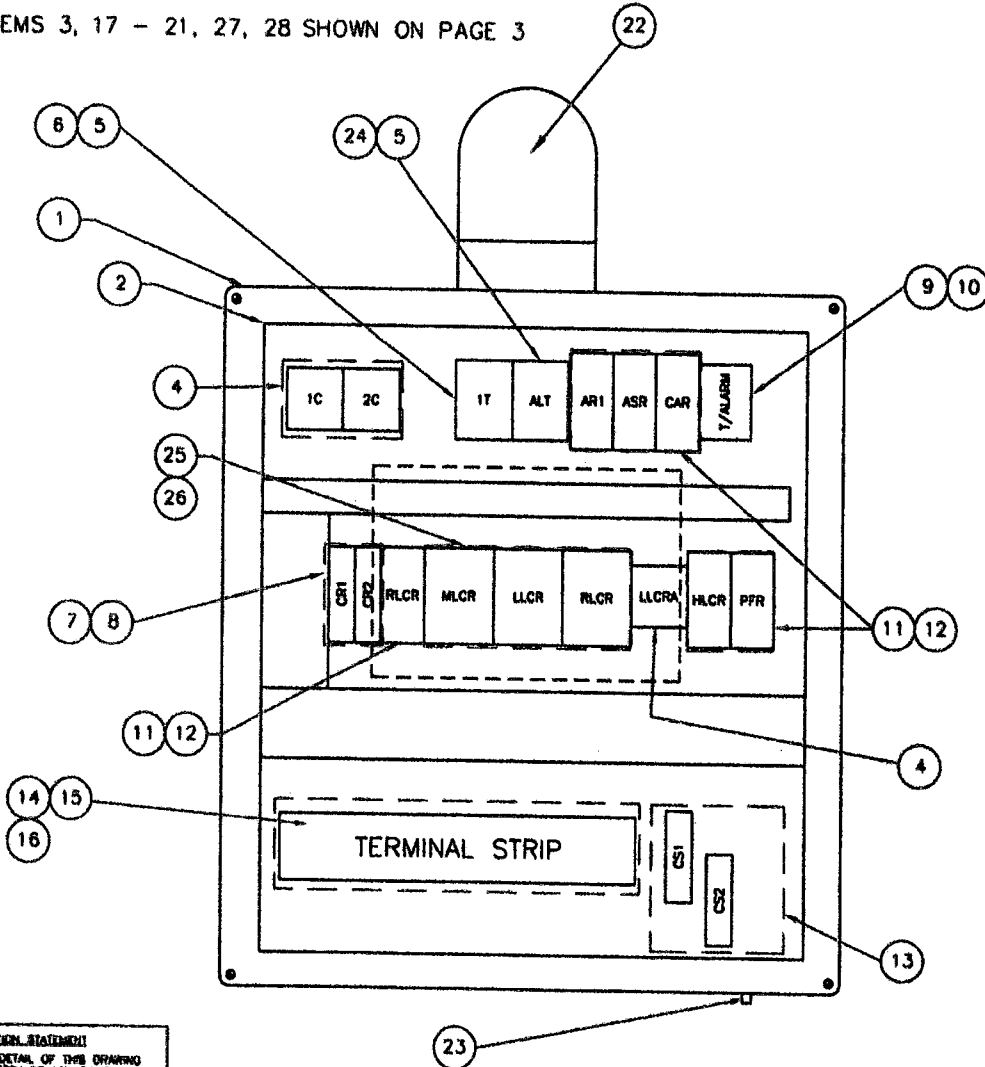


# CONTRACTOR EXTERNAL WIRING

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<b>AquaPort</b> <small>241 DUCHAMNE BLVD., NEW BEDFORD, MA 02740          (508) 998-7577 FAX (508) 998-7177</small>	
DATE: 12-10-03 DRAWN: [ ] CHECKED: [ ] APPROVED: [ ] PROJECT NO: [ ]	TITLE: EQUALIZATION #7 120V DRAWING NO: AWT3142 SHEET NO: 1 OF 1

NOTE: ITEMS 3, 17 - 21, 27, 28 SHOWN ON PAGE 3

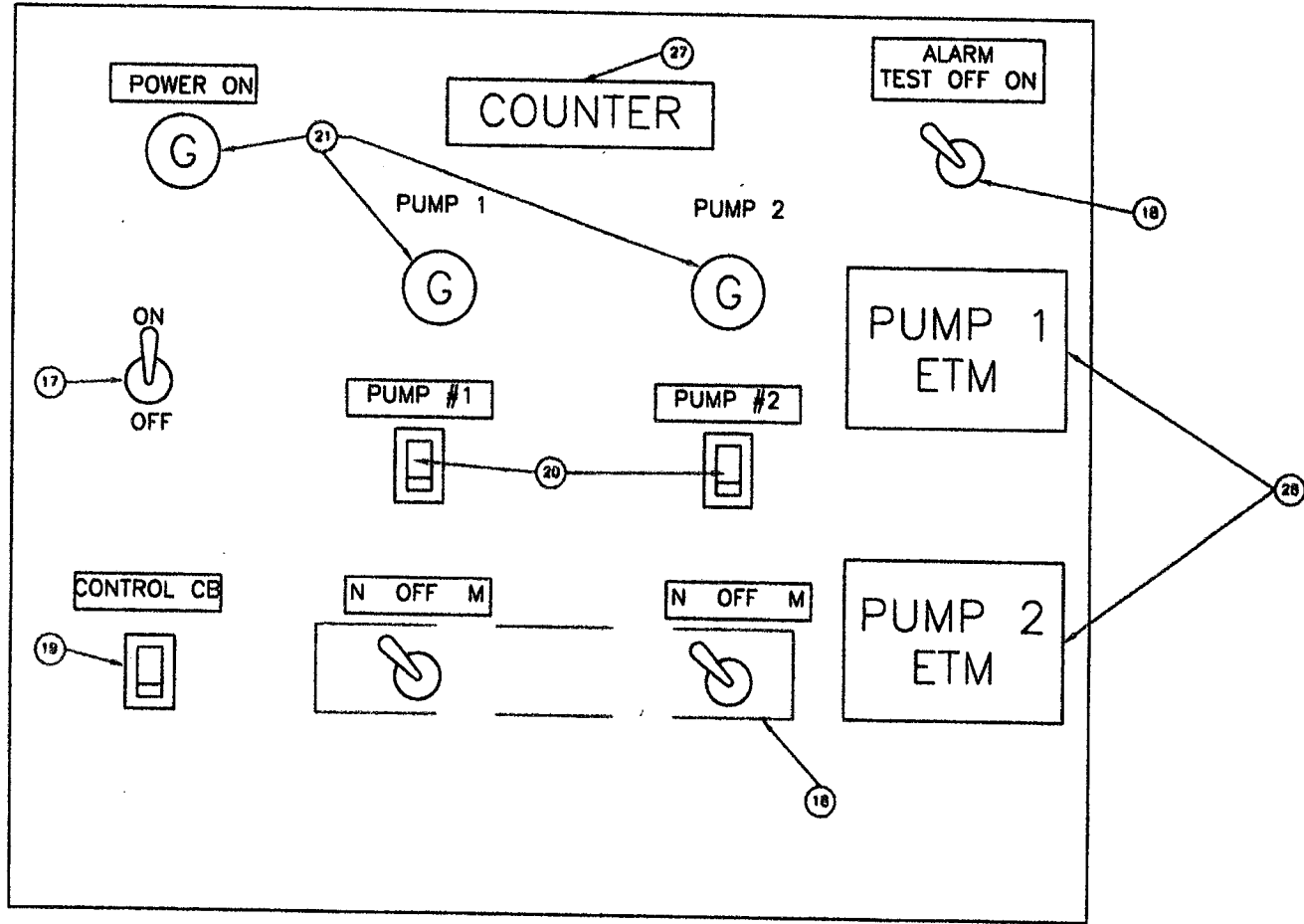


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28	3	EMM	ELAPSED TIME METER	151D2
27	1	OMRON	ARD LEVEL COUNTER	R7EC-N-8
26	2	IDEC	4 POLE RELAY SOCKETS	SR4P05
25	2	IDEC	4 POLE RELAYS	RH18ULAC120
24	1	TIME-MARK	ALTERNATOR	281D120
23	1	EATON	PUSHBUTTON SWITCH(SILENCE)	8444K4
22	1	PALITE	ALARM BEACON/HORN	R6B-120AVL
21	3	1DI	GREEN LIGHTS	102520A5
20	2	POTTER&BRUMFIELD	10 AMP CIRCUIT BREAKERS	W28XQ1A-10
19	1	POTTER&BRUMFIELD	3 AMP CIRCUIT BREAKER	W28XQ1A-3
18	3	EATON	TOGGLE SWITCH(PUMPS & ALARM)	780SK13
17	1	POTTER&BRUMFIELD	MAIN CIRCUIT BREAKER	W31K2A1G30
16	2	ENTRELEC	GROUND TERMINALS	18511318
15	18	ENTRELEC	TERMINALS	11511807
14	2	ENTRELEC	TERMINALS(H, N)	11511811
13	2	DIVERSIFIED	CURRENT SENSORS	CM90100-20
12	6	IDEC	2 POLE RELAYS	RH28ULAC120
11	6	IDEC	2 POLE RELAY SOCKETS	SR2P-05
10	1	IDEC	TIMER	NTE-PIAF20
9	1	IDEC	RELAY SOCKET 8 PIN	SR2P-08
8	2	IDEC	1 POLE RELAYS	RH18ULAC120
7	2	IDEC	1 POLE RELAY SOCKET	SR1B-05
6	1	CROUZET	TIMERS, RECYCLE TYPE	PL2R
5	2	IDEC	RELAY SOCKET 11 PIN	SR3P-05
4	3	AEG	CONTACTORS	LS0710A0
3	1	MCKINSTRY	42,108 OPERATOR PANEL	42/108
2	1	ROBROY	18 X 18 BACKPANEL	BP1818A
1	1	ROBROY	18 X 18 ENCLOSURE	J1818HPL

REV: EQUALIZATION #7 120V  
 BY: [Signature] A [Signature] AWT3142  
 FOR: [Signature] [Signature] [Signature]

NOTES:

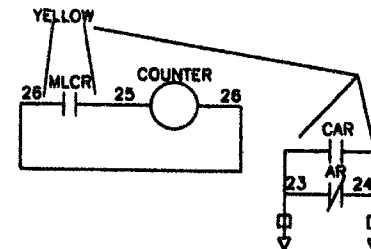
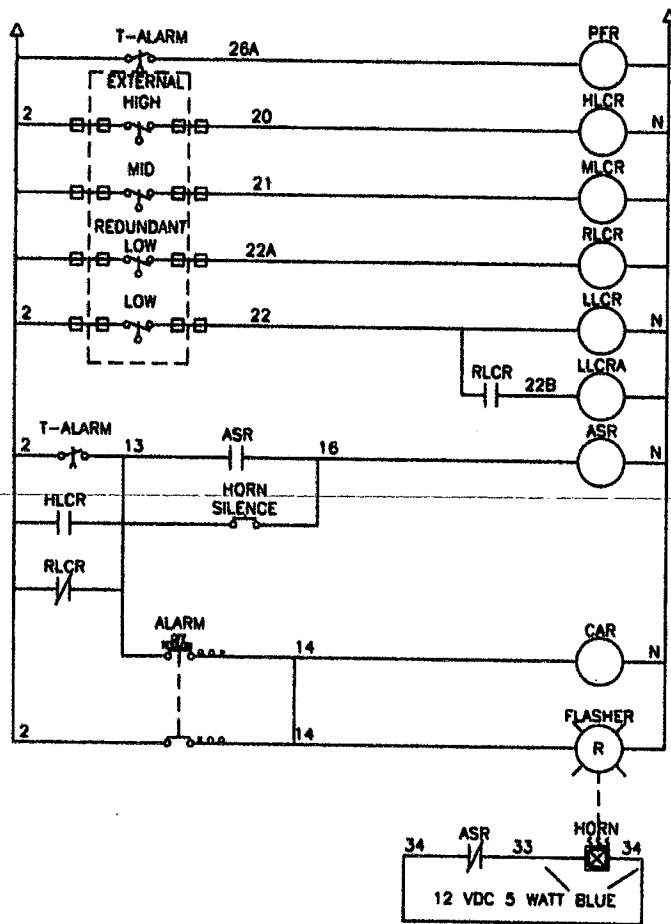


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REV	DESCRIPTION	DATE
1	EQUALIZATION AT 120V	
2	A	AWT3142
3		1987.03.01



NOTES:



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## ALARM CONDITIONS/TROUBLESHOOTING

NOTE: This is not intended to be an exhaustive list, rather, an aid to solving problems that may occur.

Causes of alarms may be isolated by determining if a breaker has tripped, a fuse has blown, and if any AR contact is opened under power. Below is a list of alarm relays with the components that are effected.

<u>ALARM RELAY</u>	<u>DEVICES AFFECTED</u>	<u>ACTION/REMEDY</u>
AR1*	"POWER ON" light fan in tank F1 C.B.	Check fan for overload/blockage. Replace C.B.
AR2	Dosing pump timer ALT, 1C, 2C	Determine cause of overload. Replace C.B.
AR3	#1 dosing pump, #1 dosing pump light breaker tripped	Check pump, determine cause of overload, reset breaker.
AR4	#2 dosing pump, #2 dosing pump light breaker tripped	Check pump, determine cause of overload, reset breaker.
AR5	Recycle pump, recycle pump light breaker tripped	Check pump, determine cause of overload, reset breaker.
CR1*	#1 dosing pump	Check pump/wiring.
CR2*	#2 dosing pump	Check pump/wiring.
CR3*	Recycle pump	Check pump/wiring.

**NOTE:**

1. AR1 operate (drop out) when power is interrupted or when fuse/CB is tripped.  
CR1-CR3 operate (drop out) when CSR relays do not sense proper motor load when motor should be running.
2. All pertain to Model 22, 24 and 30 series Bioclere units.
3. \* pertain to Model 36 series Bioclere units only.

## GENERAL DESCRIPTION OF OPERATION

1. Upon power up at panel there is a 2 minute time delay before the pump starts.
2. After this time delay, the pump will start and run for a set period of time, then turn off for another set period of time.
3. When the pump starts, the filter flush valve will open for a set period of time then close.
4. After the filter flush valve closes, a field valve will open for a set period of time then close. The closing of this valve will signal the pump to stop and enter the set period of off time.
5. After a set number of pump starts, the field flush valve will open for a set period of time after the pump starts and after the filter flush valve closes.
6. The field flush cycle will repeat itself on each subsequent pump cycle for the number of fields connected to the system before resetting.
7. In a normal cycle, the field flush valve can be opened for an adjustable period of time by momentarily pushing the "field flush" toggle switch up then releasing it. This can be repeated for additional flushes.
8. At the end of each pumping cycle, after the pump shuts off, both the filter flush and field flush valves will open for a set period of time then close.

## DESCRIPTION OF CONTROL FLOATS

1. Float FS1 is a wide angle float that when up, permits the pump to run and when down keeps the pump from running and pumping dry. Note that by placing the HAND-OFF-AUTO switch in HAND position, will by-pass all floats and the pump will pump dry if held in that position long enough. The switch spring returns to OFF when released. After FS1 activates, there is a one minute delay before the pump will start if being called to run before the float activates.
2. Float FS2 is the override timer reset float and FS3 is the override timer float. These floats operate together. If the water level reaches FS3 while in an OFF period, the pump will start and the OFF period time will change to the setting in block B02. The run time remains as set. The shorter OFF time will remain until the water level reaches FS2 after which the OFF time reverts back to the normal B01 setting.
3. Float FS4 is the high level alarm float. When the water level reaches this float, the high level alarm light illuminates continuously, and the audible alarm sounds continuously. The audible alarm can be silenced by the silence switch. When the high level recedes, the alarm will stop.
4. Float FS5 is an optional float that can be installed below FS1 that will cause an alarm at low water level. Low level alarm operation is identical to the high level alarm operation except the alarm light will flash and the audible alarm will sound intermittently.
5. Floats FS2, FS3 and FS4 can be low current, normally open, mercury type. FS1 must be of the wide angle type. FS5 can be low current, normally closed, mercury type.

## OPERATIONAL NOTES

1. Any field can be taken out of service including adjacent fields and the first and last field.
2. On power-up, the PLC reboots and dosing begins.
3. At the end of the dosing time, the off time begins. At the end of the off time, if FS-1 is up, dosing will begin.
4. If FS-1 falls while dosing, the pump will stop and the off time will begin. If after the off time expires, FS-1 is still down, all timers will stop. When FS-1 rises, dosing will begin.
5. On time begins when the dose valve opens. Off time begins when the pump stops.

## TROUBLESHOOTING

The controller is protected by fuse FU1.

The solenoid valves are protected by fuse FU2.

The heater is protected by fuse FU3.

The controller will alarm under the following conditions.

1. High level in dose tank (constant on)
2. Low level in dose tank (flashes)

FU1 blows - check float switches and wiring

FU2 blows - check solenoid valves and wiring

FU3 blows - check heater and wiring

Pump(s) circuit breaker trips - check pump(s) and wiring

**DISCONNECT ALL POWER TO PANEL BEFORE SERVICING**

## SYSTEM MAINTENANCE

The best way to assure years of trouble free life from your system is to continuously monitor the system and to perform regular maintenance functions. For large systems or systems with a BOD > 30 mg/l automation of maintenance is essential. For smaller systems with a BOD < 30 mg/l inspection and maintenance should be performed every six months.

### ROUTINE AND PREVENTATIVE MAINTENANCE

- 1) Clean the filter cartridge. This may be done with a pressure hose. The screen filter cartridge should be cleaned from the outside inwards, while the discs in the disc filter cartridge should be separated and then cleaned. If bacteria buildup is a problem, we advise first trying lye, and if the problem persists, soak the filter cartridge in a chlorine bath - a mixture of 50% bleach and 50% water.
- 2) Open the field flush valve and flush the field for 3-5 minutes by activating the pump in "manual" position. Close the flush valve. On automatic solenoid valves the manual bleed lever should always be in the closed position and the dial on top should be free spinning. This allows it to open when pulsed electrically. Clockwise rotation closes valve.
- 3) With the pump in the "manual" position, check the pressure in the drip field by using a pressure gauge on the schrader valve located on the air vents and by reading the pressure gauge located in the Wasteflow Headworks box. The pressure should be the same as shown on the initial installation records. On systems with manual flush valves, close the field flush valve completely and then open the valve slightly until there is a 1-2 psi drop or design pressure is reached. This will allow the field to drain after each dose to prevent the manifold lines from freezing.
- 4) Remove the lids on the vacuum breaker and check for proper operation. If water is seen leaking from the top of the vacuum breaker, remove the cap of the vacuum breaker and press down on the ball to allow any debris to be flushed out. Be careful not to come in contact with the effluent.
- 5) Turn off the pump and reset the controller for auto mode.
- 6) Periodically remove and clean the air vents, field flush and filter flush valves.
- 7) Visually check and report the condition of the drip field, including any noticeable wetness.
- 8) Treatment and distribution tanks are to be inspected routinely and maintained when necessary in accordance with their approvals.
- 9) Record the elapsed time meter, pump counter, override counter, high-level alarm and power failures. This information can be obtained from the controller.

## HOME OWNERS GUIDE FOR CARE AND MAINTENANCE OF GEOFLOW DRIP DISPERSAL FIELD

A drip dispersal system has been installed on your property for the subsurface dispersal of the effluent from your home.

The drip dispersal system consists of a series of 1/2" diameter drip tubing installed at a shallow depth of 10" below the ground surface. It is designed to effectively disperse the treated effluent in the ground with a combination of soil absorption and plant uptake. Your drip dispersal system will function for many years with only minimal maintenance being required, provided the following recommendations are followed:

- Establish landscaping (preferably a grass cover) immediately. This will stabilize the soil and allow for grass to take up the water.
- Do not discharge sump pumps, footing drains or other sources of clear water to the system, except the effluent discharge from your treatment system.
- Maintain all plumbing fixtures to prevent excess water from entering the dispersal system.
- Do not drive cars, trucks or other heavy equipment over the drip dispersal field. This can damage drip components or the soil and cause the system to malfunction. Lawn mowers, rubber wheeled garden tractors and light equipment can be driven over the drip field.
- Do not drive tent stakes, golf putting holes, croquet hoops etc., into the dispersal field.
- Contact your service company if your high water alarm should sound. The pump chamber is sized to allow additional storage after the high water alarm sounds but you should refrain from excessive water usage (i.e., laundry) until the system has been checked.
- After a temporary shut down due to a vacation or other reason, the treatment plant ahead of the drip filter initially may not function effectively, resulting in the filter blocking. Refer to maintenance guidelines above to clean the filter.

Contact your service company if you notice any areas of excessive wetness in the field. In most cases this is usually caused by a loose fitting or a nicked dripline and can be easily repaired. Note: There may be some initial wetness over the dripline following the system's installation. This should cease once the ground has settled and a grass cover is established.

# SITE INSPECTION SHEET

Site Address \_\_\_\_\_

Date \_\_\_\_\_

## Site observations

- 1 Is dripfield located at the lowest point in the site where all waters may pond?
- 2 Is there any water coming in from neighbors? Downspouts? Irrigation?
- 3 Construction debris anywhere near the site, or compaction from construction or other causes?
- 4 How wet is the field before digging?
- 5 Will effluent drain back to tank in freezing climates? If not, is equipment insulated from freezing?

## Pump tank

- 1 Watertight?
- 2 At grade. Allow surface water to run off.
- 3 Inlet and outlet lines to be laid in gravel or compacted soils.
- 4 Float free designed for easy removal for service and adjustment.
- 5 Float settings correct to design?
- 6 Pump set a few inches up from the bottom of the tank.
- 7 Waterproof wire nuts used to wire pump junction box.

## Headworks - Filter and flush valves

- 1 Waterproof wire nuts used in wiring solenoid valves
- 2 Is filter large enough to handle flow? Is it appropriate for the treatment unit?
- 3 Clean filter and valves after construction.
- 4 Check filter everytime system is serviced, and clean filter element.
- 5 Clean valves if they do not close properly. See if different valves have different toggles.
- 6 Insulate in freezing climates.
- 7 Have minimum of 1/2ft depth of 1" gravel under the Headworks for drainage and to keep gophers out.
- 8 Check pressure - across filter (if available).
- 9 Check pressure - on return line pressure should be as designed. Lower than 5 psi may be too low.

## Zone valves

- 1 Index valves - Requires 10 gpm min. flow, needs to self drain in freezing climate.
- 2 Solenoids - Clean after installation if they do not close properly.

## Supply and return lines

- 1 Make sure they are supported going into and out of the Headworks.
- 2 No dips.
- 3 Make sure water from dripline does not flow back into supply and return trenches.

## Dripline

- 1 On contour.
- 2 Burial depth.
- 3 Check for kinking and local undulations (low areas) in installed driplines.
- 4 Flush lines during construction.
- 5 Is there ponding on surface?
- 6 Cover crop over field?

## Airvents

- 1 Point of pressure measurement.
- 2 Insulate in freezing climates.
- 3 Make sure they are not in a position for surface or subsurface water to enter the system.
- 4 Check pressure at airvents. Should be as designed. Less than 7psi may be too low.

## Return to?

- 1 Pump tank? Don't churn the tank on return.
- 2 Pretreatment? Can the equipment handle the additional flow.

## Controller

- 1 Check field programmable settings against design.
- 2 Proper wiring of controller....wire floats and valves.
- 3 Keep moisture from running up wire into controller.

## Notes

- 1 Use sheet for "As built" in Design Guidelines.
- 2 Keep a record of start-up pressures and system data screens.

## Comments:

Geeflow Inc., Toll Free 800-328-8228, Fax: 415-927-0100, [www.geeflow.com](http://www.geeflow.com)

## TROUBLE SHOOTING GUIDE:

Symptom: High water alarm activates periodically (1-2 times/week). During other times the water level in the pump chamber is at a normal level.

Possible cause: Peak water usage (frequently laundry day) is causing a temporary high water condition occur.

Remedy: Set timer to activate the pump more frequently. Be sure to not exceed the total design flow. avoid this, reduce the duration of each dose.

Remedy: Provide a larger pump tank to accommodate the peak flow periods.

Symptom: High water alarm activates during or shortly after periods of heavy rainfall.

Possible cause: Infiltration of ground/surface water into system.

Remedy: Identify sources of infiltration, such as tank seams, pipe connections, risers, etc. Repair required.

Symptom: High water alarm activates intermittently, including times when it is not raining or when laundry is not being done.

Possible cause: A toilet or other plumbing fixture may be leaking sporadically but not continuously. Check water meter readings for 1-2 weeks to determine if water usage is unusually high for the number of occupants and their lifestyle. Also determine if water usage is within design range.

Remedy: Identify and repair fixture.

Symptom: High water alarm activates continuously on a new installation (less than 3 months of operation). Inspection of the filter indicates it is plugged with a gray colored growth. Water usage is normal.

Possible cause: Slow start-up of treatment plant resulting in the presence of nutrient in the effluent sufficient to cause a biological growth on the filter. This is typical of lightly loaded treatment plants that receive a high percentage of gray water (i.e., from showers and laundry),

Remedy: Remove and clean filter cartridge in a bleach solution. Add a gallon of household bleach to pump tank to oxidize organics. Contact treatment plant manufacturer for advice on speeding up the treatment process possibly by "seeding" the plant with fresh activated sludge from another treatment plant.

Symptom: Water surfaces continuously at one or more isolated spots, each one foot or more in diameter.

Possible cause: Damaged drip line or a loose connection is allowing water be discharged under pressure and therefore at a much greater volume than intended.

Remedy: Dig up drip line. Activate pump and locate leak. Repair as required.

Possible cause: If water is at base of slope, can be caused by low-head drainage.

Remedy: Install check valves and airvents in the manifolds to redistribute water in the system after pump is turned off. This is not advised for freezing climates where manifold drainage is required.

Symptom: A portion of the drip field closest to the feed manifold is saturated while the rest of the field is dry.

Possible cause: Insufficient pump pressure. A pressure check at the return manifold indicates pressure of less than 10 psi.

Remedy: Check filter and pump intake to insure they are not plugged. If they are, clean as require.

Remedy: Leaks in the system may be resulting in loss of pressure. Check for water leaks in connections and fittings or wet spots in the field. Also check air vents to insure they are closing properly. Repair as necessary.

Remedy: Pump is worn or improperly sized. Pressure at feed manifold in less than 15 psi. Verify pressure requirements of system and provide a new or larger pump. As an alternate approach, the drip field may need to be divided into two or more zones.

Possible cause: The duration of each dose is of insufficient length to allow the drip field to become pressurized before the pump shuts off (or runs for only a brief time before turning off).

Remedy: Increase the pump run time and decrease the frequency of doses. Always calculate (or observe during field operation) how long the system takes to fully pressurize and add this time to the design dosing duration.

Symptom: High water alarm begins to activate continuously after a long period (1-2 years) of normal operation. Inspection of the filter indicates it is plugged with a heavy accumulation of sludge.

Possible cause: A buildup of solids in the pump tank due to carryover from the treatment plant.

Remedy: Replace the filter cartridge with a clean cartridge. Check the pump tank and if an accumulation of solids is noted, pump the solids out of the pump tank. Also, check the operation of the treatment plant to insure it is operating properly.

Symptom: Water surfaces at several spots in drip field during dosing periods. Installation is recent, less than 6 months of usage and the soil is a moderate to heavy clay. Possibly, the installation was completed using a non-vibratory plow.

Possible cause: Smearing of the soil may have occurred during installation of drip line. Also, the "cut" resulting from the installation allows an easy path for the water to surface during dosing.

Remedy: In most cases the sod will compact naturally around the drip line and the surfacing will diminish and ultimately cease. To help, reduce the duration of each dose and increase the number of doses/day. Also, it will help to seed the area to encourage the development of a good root zone.

Symptom: Entire area of drip field is wet, soft and spongy. It appears to be totally saturated with water. Situation occurs during dry season when there is little rainfall.

Possible cause: Water being discharged to drip field exceeds design. Excess water may be a result of infiltration, plumbing leaks or excessive water usage.

Remedy: Check water meter, elapsed time meter, pump counter, override counter or high level alarm counter to determine if water usage is in excess of design. Check for leaks or infiltration. Repair leaks as required. Reduce water usage by installing water saving fixture.

Remedy: If water usage cannot be reduced, enlarge drip field as required.

Possible cause: Area of drip field was inadequately sized and is too small.

Remedy: Provide additional soil analysis to verify sizing and enlarge as required.



## Valve Troubleshooting

### Symptom: Valve will not open manually

- Check water supply and any possible master or gate valves to insure they are open.
- Check that the valve is installed with the arrow pointing in the downstream direction
- Check that the flow control is fully open, counterclockwise.
- Turn off the water supply. Remove the solenoid and check for debris blocking the exhaust port.
- Turn off the water supply. Remove the cover. Inspect the diaphragm for damage and replace necessary.

### Symptom: Valve will not open electrically

- Check voltage at controller for 24 VAC station.
- Check voltage across the solenoid lead wires for minimum 21 VAC.
- Make sure handle on top of valve is free spinning. Not all the way open or all the way closed.
- If the valve still does not operate, electrically replace the solenoid.

### Symptom: Valve will not close

- Insure the manual bleed lever is in the closed position.
- Check for leaks around the flow control, solenoid or between valve cover and body.
- Turn off the water supply. Remove the solenoid and check for debris or damage to the exhaust port.
- Turn off the water supply. Remove valve cover and inspect for debris under diaphragm or debris in diaphragm ports.

### Symptom: Slow leak

- Check for dirt or gravel embedded in the diaphragm seat.
- Check actuator and exhaust fitting for proper seating.

FLOAT SELECTION CHART

<u>NUMBER OF FLOATS</u>	<u>FLOAT</u>				
	FS1	FS2	FS3	FS4	FS5
5 FLOAT SYSTEM	WA	S	S	S	S(N.C.)
4 FLOAT SYSTEM	WA	S	S	S	-
3 FLOAT SYSTEM	WA	-	WA	S	-
2 FLOAT SYSTEM	WA	-	-	WA	-

WA = NORMALLY OPEN WIDE ANGLE  
HIGH OR LOW CURRENT RATING

S = NORMALLY OPEN STANDARD NON-WIDE ANGLE  
HIGH OR LOW CURRENT RATING

N.C. = NORMALLY CLOSED FLOAT

FS1 - WIDE ANGLE FLOAT THAT, WHEN UP, WILL ALLOW THE PUMP TO START AND WHEN DOWN, WILL STOP THE PUMP. IT KEEPS THE PUMP FROM RUNNING DRY.

FS2 - WHEN DOWN, RESETS THE OVERRIDE FUNCTION.

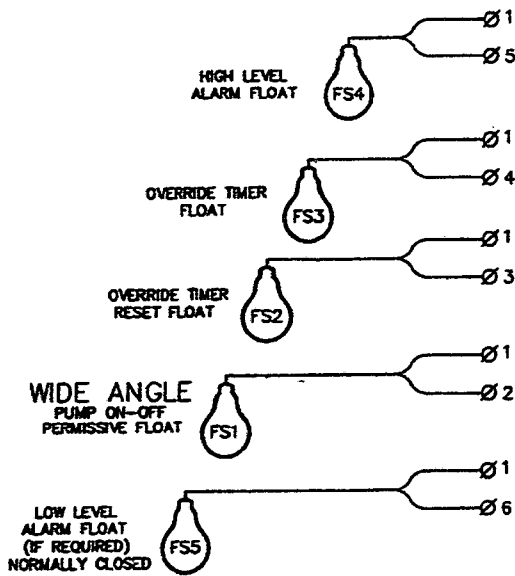
FS3 - WHEN UP, STARTS A PUMP CYCLE AND OPERATES ON A SHORT PUMP CYCLE UNTIL FS2 DROPS.

FS4 - WHEN UP, ALARMS HIGH LEVEL. DOES NOT START PUMP.

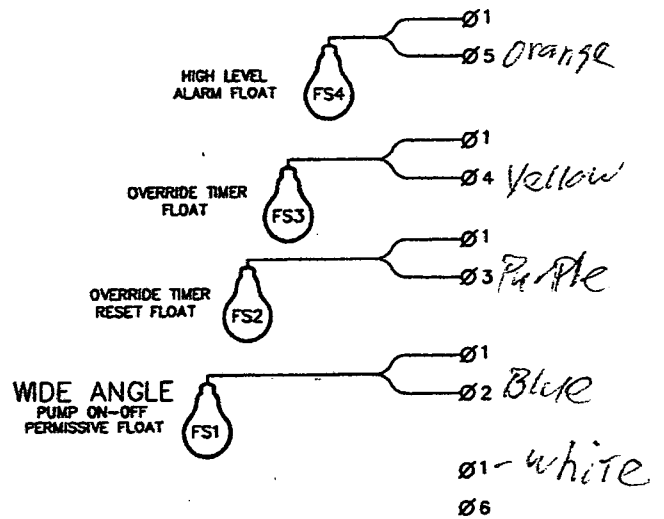
FS5 - WHEN DOWN, ALARMS LOW LEVEL. DOES NOT STOP PUMP.

**GEOFLOW**

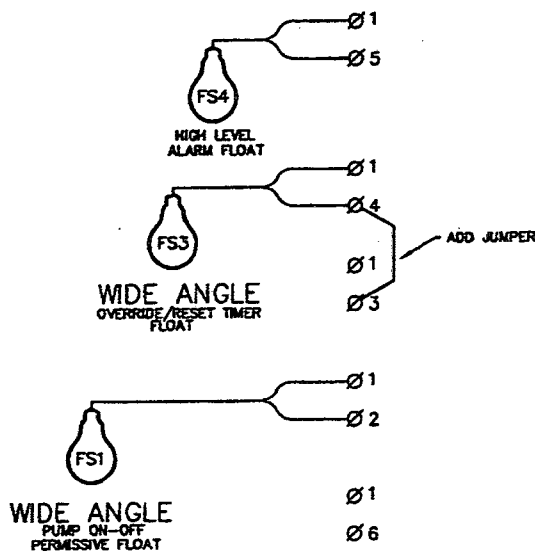
**SUBSURFACE DRIP SYSTEMS**



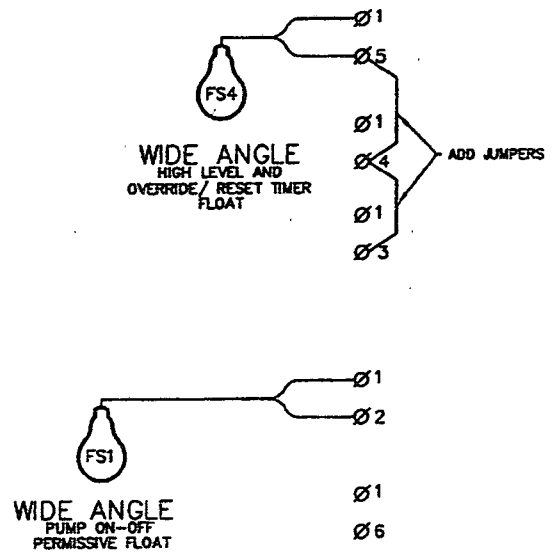
**5 FLOAT SYSTEM**



**4 FLOAT SYSTEM**



**3 FLOAT SYSTEM**



**2 FLOAT SYSTEM**

**GEOFLOW**

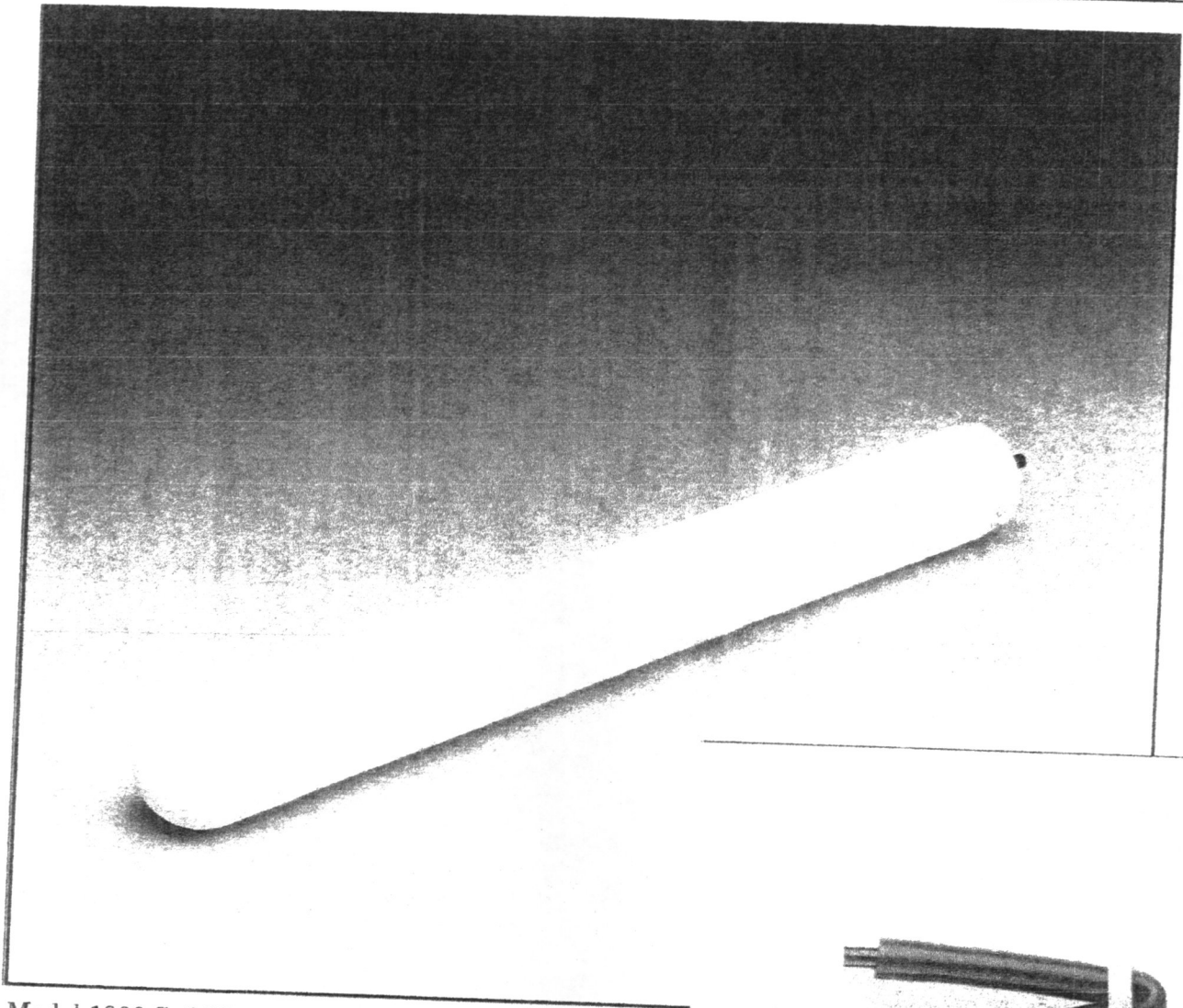
**SUBSURFACE DRIP SYSTEMS**

# 1900

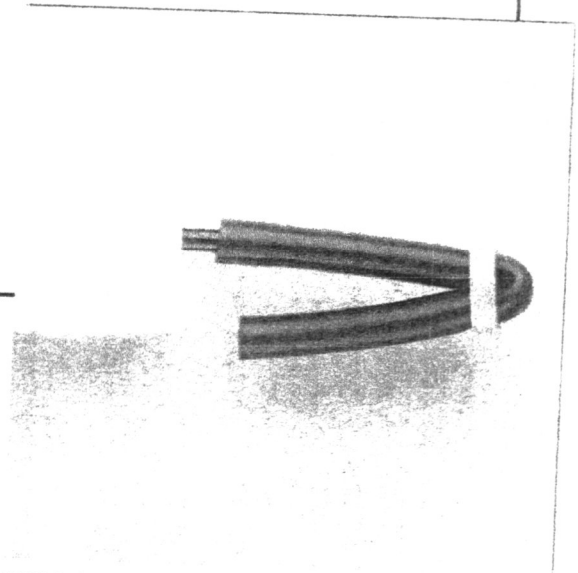
# OPERATING INSTRUCTIONS

1900 Soil Water Samplers

January 1999



Model 1900 Soil Water Sampler



1900-200 Stopper Assembly (Shows stopper,  
Neoprene tubing and clamping ring)

**SOILMOISTURE EQUIPMENT CORP.**

P.O. Box 30025, Santa Barbara, California 93130 USA

Phone: (805) 964-3525 · Fax: (805) 683-2189

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1



## OPERATING PRINCIPLES

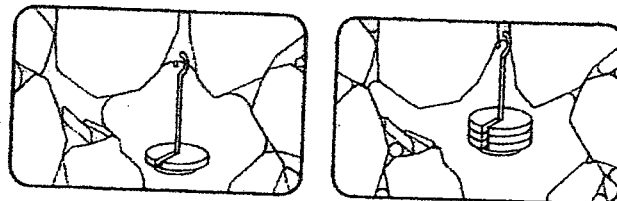
Soilmoisture's Soil Water Samplers, which are also referred to as "suction lysimeters" or "lysimeters", have been in general use around the world for many years.

Soil water is held largely under a state of tension (negative pressure) within the soil by capillary forces. The capillary force is the sum of the adhesive and cohesive forces. The adhesive force is characterized as the attraction of water for soil solids (soil and organic matter). Cohesive force is characterized as the attraction of water for itself. Adhesive force is far greater than the cohesive force.

Water is naturally attracted to soil particles (by its adhesive quality) and "sticks" to the surface of each particle and in the various sized "capillary" spaces or "pores" between the soil particles. When the soil is very wet, the large pores fill with water. This "excess" water has no direct surface contact with the soil and is held cohesively, one water molecule to another, and can move quite freely. As a soil dries out, the "excess" water first evaporates as it requires less energy to break the cohesive bonds. The remaining water, held tightly inside the capillary spaces by adhesive qualities, requires more energy to be removed from the soil.

The following illustration (see Figure 1) shows the increasing force required to remove water from the small-sized capillary pores compared to the large pores as the soil dries out. When the remaining water is held only in extremely small pore spaces, it requires more energy to remove the water from these pores. Even though there may be a considerable volume of water in the soil, the tension that holds the water determines how readily it can be removed.

Figure 1.



Wet Soil

Dry Soil

This tension that determines how moisture moves in the soil is referred to as "soil water tension", "negative pore pressure", or "soil suction". For simplicity's sake we refer to this tension as "soil suction" in these instructions, but keep in mind that negative pressure is the most descriptive term.

The following graph shows the relationship between the percent of moisture in a soil and the soil suction required to remove the moisture from three types of soil: clay, loam, and sand. The graph (see Figure 2) illustrates that it is easier to remove water from a sandy soil with 10% mois-

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ture, than it is to remove water from a clay soil with 30% moisture. This is because the water in the clay soil is held in very small capillary spaces within the soil particles under a higher soil suction, whereas the sandy soil holds water in large capillary spaces under a lower soil suction.

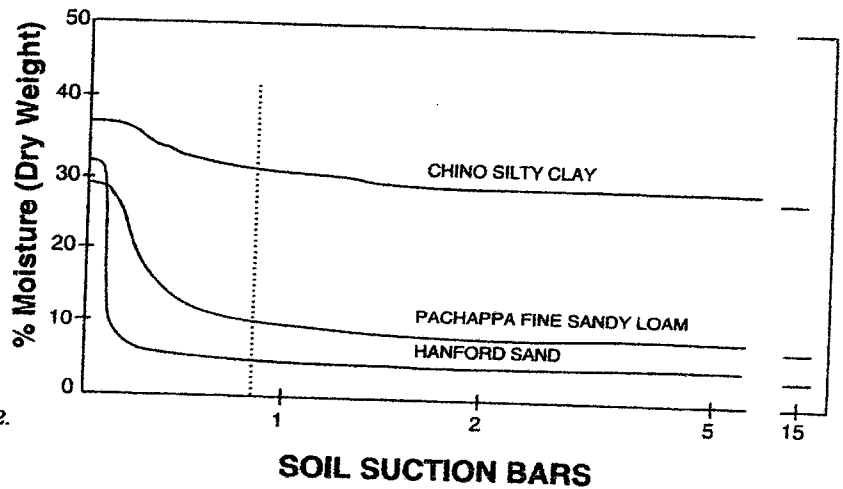


Figure 2.

Soilmoisture's Soil Water Samplers allow water to be removed from the soil by creating a vacuum (negative pressure or suction) inside the sampler greater than the soil suction holding the water in the capillary spaces. This establishes a hydraulic gradient for the water to flow through the porous ceramic cup and into the sampler. Note: when evaluating soil suction ratings of a ceramic plate or cup, a positive pressure rating is used. Water can be held at tensions far greater than 1 atm (the limit for vacuum-type measurements). Positive pressure can force water out of capillary pores equivalently as negative pressures, and is the practical method for evaluation of soil suction.

In practice, a vacuum is drawn in the Soil Water Sampler that exceeds the soil water tension. Then liquid water will flow to the ceramic cup due to the potential gradient (i.e. water will move from less negative potential to more negative potential). The practical limit for water flow in soils is about 65 cb (centibar) (although in some soils, the value can approach 85 cb). When soil moisture tensions exceed 2 bars, the wetted meniscus in the ceramic pores will break and the Soil Water Sampler will appear to be unable to hold vacuum. The ceramic cup will have to be rewetted to hold a vacuum and soil moisture tensions will have to decrease to less than 85 cb before water can again be moved toward the ceramic cup.

Additional information on the advantages and disadvantages of Soil Water Samplers in general can be found in Chapter 19, "Compendium of In Situ Pore Liquid Samplers for Vadose Zone" (Dorrance et al.), of the ACS Symposium on Groundwater Residue Sampling Design (April 22-27, 1990) and the ASTM Designation D4696-92 "Standard Guide for Pore-Liquid Sampling from the Vadose Zone" (Vol. 04.08 Soil and Rock (I): D4696).

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ENVIRONMENTAL

Zoeller Family of Water Solutions™

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www.clarusenvironmental.com

SECTION: C1.50.130

CL0032

0212

Supersedes

0911

# Centrifugal STEP Systems

## OWNER'S MANUAL

Congratulations on the purchase of the Clarus Environmental Centrifugal STEP System. This system will provide years of trouble-free service when installed according to the manufacturer's recommendations.

Please read and review this manual before installing the product. The instructions contained herein, when followed correctly, will not only ensure a long and problem-free life for the system, but also save time and money during installation. Should further assistance be necessary please call Clarus Environmental at 1-877-244-9340.

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### Owner's Information

Model Number: \_\_\_\_\_ Date Code: \_\_\_\_\_

Job Name: \_\_\_\_\_

Dealer: \_\_\_\_\_

Date of Purchase: \_\_\_\_\_

Contractor: \_\_\_\_\_

Date of Installation: \_\_\_\_\_

System Readings During Operation: Voltage \_\_\_\_\_ Amps \_\_\_\_\_

### Safety Instructions

**TO AVOID SERIOUS OR FATAL PERSONAL INJURY OR MAJOR PROPERTY DAMAGE, READ AND FOLLOW ALL SAFETY INSTRUCTIONS IN MANUAL AND ON THE PUMP.**

**THIS MANUAL IS INTENDED TO ASSIST IN THE INSTALLATION AND OPERATION OF THIS UNIT AND SHOULD BE KEPT WITH THE SYSTEM.**



This is a **SAFETY ALERT SYMBOL**.

When you see this symbol on the pump or in the manual, look for one of the following signal words and be alert to the potential for personal injury or property damage.

- ▲ DANGER** Warns of hazards that **WILL** cause serious personal injury, death or major property damage.
- ▲ WARNING** Warns of hazards that **CAN** cause serious personal injury, death or major property damage.
- ▲ CAUTION** Warns of hazards that **CAN** cause personal injury or property damage.
- ▲ NOTICE** INDICATES SPECIAL INSTRUCTIONS WHICH ARE VERY IMPORTANT AND MUST BE FOLLOWED.

**THOROUGHLY REVIEW ALL INSTRUCTIONS AND WARNINGS PRIOR TO PERFORMING ANY WORK ON THIS PUMP.**

**MAINTAIN ALL SAFETY DECALS.**

**REFER TO WARRANTY ON PAGE 2.**

## Timed Dosing Applications

Clarus Environmental Centrifugal STEP Systems are adaptable for Timed Dosing Applications using the following recommendations.

- Refer to Clarus Environmental Centrifugal STEP Systems catalog sheet (CL0031) and Clarus Environmental Timed Dosing Panels catalog sheet (CL0107) for ordering the correct panel part number.
- If the system is dosing a collection system, drainfield, sand filter, wetland, or some other secondary wastewater treatment system, the ideal dosing pattern should be known and applied.

- The alarm must be activated before the effluent level reaches the bottom of the existing outlet pipe. The alarm can be set higher, up to the bottom of the inlet pipe, if the existing outlet pipe has been plugged. This can be determined by measuring the location and elevation of the discharge pipe.
- Filling the septic tank with water after completion of the installation must be done in order to check the pump and alarm.

## Operation

### GENERAL

The centrifugal septic tank effluent pumping (STEP) system is designed to be an easily installed, drop in pump basin that does not require an additional pump chamber. However it can be installed in a secondary pumping chamber. By using a submersible pump, high head pressures are achieved. The system was designed for convenience. The filters are easily removed for servicing. The filter has 528 linear feet of 1/16" filtration. This large surface area ensures adequate filtering, and a longer interval between necessary servicing.

### SHORT TERM STORAGE

If unit is to be stored for six months or longer:

- Store system inside whenever possible or cover with some type of protective covering
- Store unit upright in original shipping container
- Ideal storage temperatures are 45 to 90 degrees
- Tape or seal in a plastic bag the terminal ends of the wire leads

If panel is to be stored for more than six months, the following is advised:

- Store the panel inside whenever possible and leave in the shipping box
- All openings must be sealed
- Store in an upright position
- Do not stack anything on top of panel

### START-UP

Before placing the equipment into operation the following must be checked:

- Septic tank should be pumped and cleaned prior to installation in existing system
- Installation needs to be according to instructions
- Installation should include an easy access riser and tamper resistant lid
- Filter assembly needs to be in place and secure
- Floats need to be in place, secure and adjusted for proper cycling
- Make sure float switches are free to move within the basin
- Be sure electrical connections are watertight and conform to uniform building codes

- When a check valve is used, drill a 3/16" vent hole in pipe, between the pump and check valve to insure the pump will not airlock
- If a control panel is used, the panel must be dry and securely installed

Fill the septic tank with water and check the system operation before placing into service.

After installing the pump into the containment area with adequate submergence, open the discharge valve fully. Start the unit using manual controls. If flow is appreciably less than rated performance, pump may be air locked. To expel trapped air, jog the unit several times, using the manual controls.

Have a qualified electrician take voltage and current measurements on the black wire of single phase. Record these readings in the space provided in the "Owner's Information" section of this manual for future reference.

Be sure to complete all items such as installing the lid on the riser, securely closing the control panel, and checking the system operation have been completed before placing the system into service.

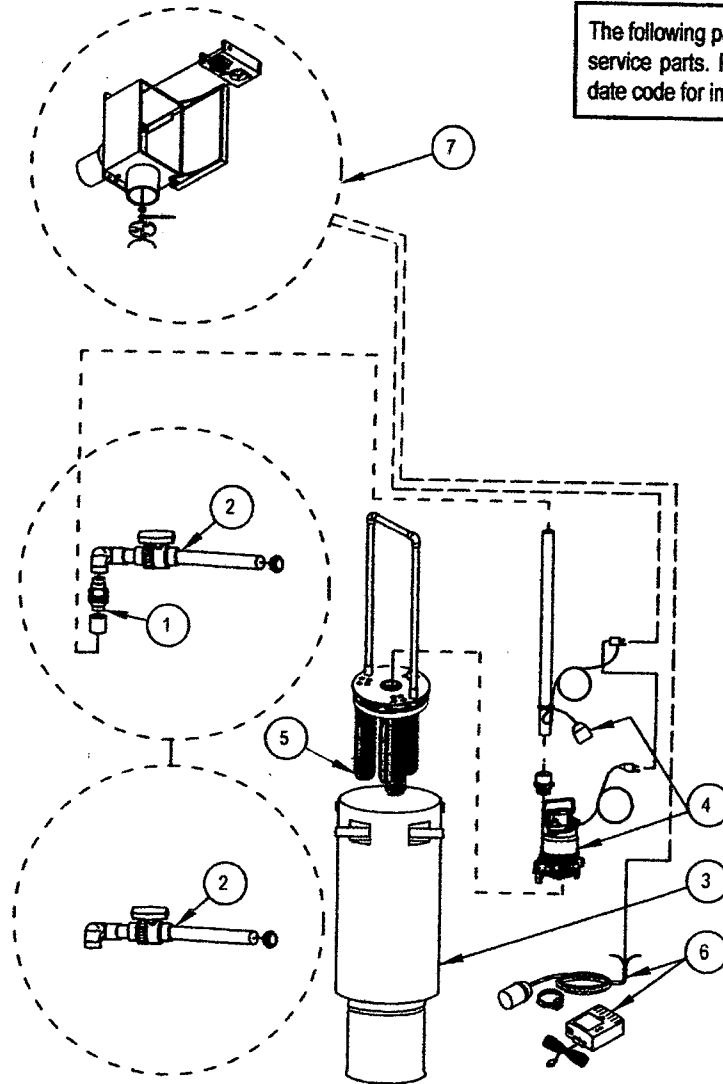
### OPERATION

- If the system is dosing a collection system, drainfield, sand filter, wetland, or some other secondary wastewater treatment system, the ideal dosing pattern should be known and applied.
- The high water alarm will indicate the system needs maintenance. However, regular maintenance by trained professionals is a necessary part of operation.
- During operation, the system owner must continue to use proper septic tank ownership practices. Ground garbage, hair, grease, and non-flushable paper products should be prevented from entering any septic system. These materials will be prevented from entering the drainfield by the filter apparatus, but abuse of the system will result in the need for more frequent servicing.



# Replacement Parts

The following parts lists are provided for ordering service parts. Please have pump model number and date code for immediate service.



SK1667

## SERVICE PARTS LIST FOR CENTRIFUGAL STEP SYSTEM

SYSTEM		5040-0001 thru 5040-0025 1/00 thru Current
1	Check Valve	30-0181
2	Discharge Assembly with Check Valve	170-0084
	Discharge Assembly without Check Valve	170-0083
3	Tank	011300
4	Pump, N51, Nonautomatic (Pump Only)	51-0002
	Pump, BN51, Automatic (Pump and Switch)	51-0006
	Pump, N142, Nonautomatic (Pump Only)	142-0002
	Pump, BN142 Automatic (Pump and Switch)	142-0006
	Piggyback Pump Switch (Switch Only)	10-0063
5	Filter Cartridge Assembly	011303
6	Indoor Alarm Pak (Alarm Box and Switch)	10-1494
	Outdoor Alarm Pak (Alarm Box and Switch)	10-0623
	Mechanical Float Switch, 15' cord (Float Switch Only)	10-0743
7	Qwik Box	10-0579

## Maintenance



**▲ WARNING** For your personal safety and health, a high quality pair of rubber gloves are recommended while servicing this unit. For your personal health, always wash your hands with antibacterial soap after servicing this unit.

**▲ WARNING** Always disconnect pump and panel from its power source before servicing

### GENERAL

Clarus Environmental Centrifugal STEP Systems require periodic maintenance to remain in operational condition. A qualified service technician should carry out the required maintenance. These technicians will not only service the pump unit, but can assess the health of the septic tank.

### SERVICE FREQUENCY

- The system contains an effluent filter. This filter will prevent solids larger than 1/16" from entering the pump compartment. The filter will require cleaning. The cleaning interval is determined by household use patterns. For example, a single individual may need a filter cleaning and inspection on yearly intervals, but a family with teenagers may require filter maintenance every six months, or sooner. The pump tank and pump should be serviced at a minimum each time the septic tank is pumped. Annual inspections by trained professionals are recommended.
- Alarm activation between service intervals may be an indication that the system is not being serviced often enough. **The alarm indicates a high liquid level and service is required immediately to avoid flooding and sewage back up into the house.**

### SERVICING THE UNIT

During filter maintenance, the service technician must perform the following:

- Check the sludge level of the septic tank. If the sludge level approaches the bottom of the STEP vault, the septic tank needs to be pumped.
- The pump should be removed, cleaned, and inspected. Any defective

components should be replaced. Inspect and remove any sand, debris, or mud present in the pump basin assembly.

- Inspect the panel for any presence of moisture in enclosure, loose connections, and general component condition.
- Check for proper location and unobstructed float operation.

### To remove the entire system:

1. The pump and filter tank must be removed for cleaning and servicing. This provides an opening for pumping out the septic tank. Remove the riser ring cover only after disconnecting power to both the pump and alarm.
2. Disconnect the pipe union in the discharge pipe and remove the entire pump tank assembly. Hose off assembly as it is being removed to avoid any spillage of sewage or effluents outside the septic tank.
3. Lift assembly out of the riser and stand upright on ground or level working surface. Remove one of the 1 1/2" support pipes, and then remove lid, pump/float assembly, and discharge pipe. Place over septic tank opening and hose down thoroughly. The cordage from the junction box to the pump is of sufficient length to avoid the necessity of disconnecting the electrical wiring in the junction box. Do not disturb wiring connection unless pump is being replaced or repaired. If access is required to the junction box, disconnect power. Power is disconnected in the Qwik Box by unplugging the connections.
4. With tank & filter over the opening, hose down the inside and outside tank. Remove filter pack from tank by pushing on filter pack at the bottom of the tank through opening or pulling from the top side.
5. Reinstall filter in tank. Check float assemblies for proper operation and reassemble pump piping and lid on filter tank. Reinstall 1 1/2" support pipe. Install pump and filter tank back in tank and reconnect union.
6. Fill tank with water and check out the pump system and alarm.
7. Follow **Start-up** procedures located in the Operation section of this manual to get system running again.

## Service Checklist



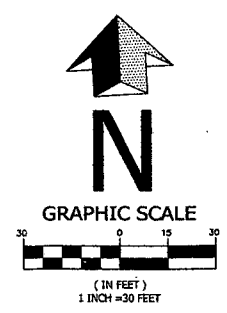
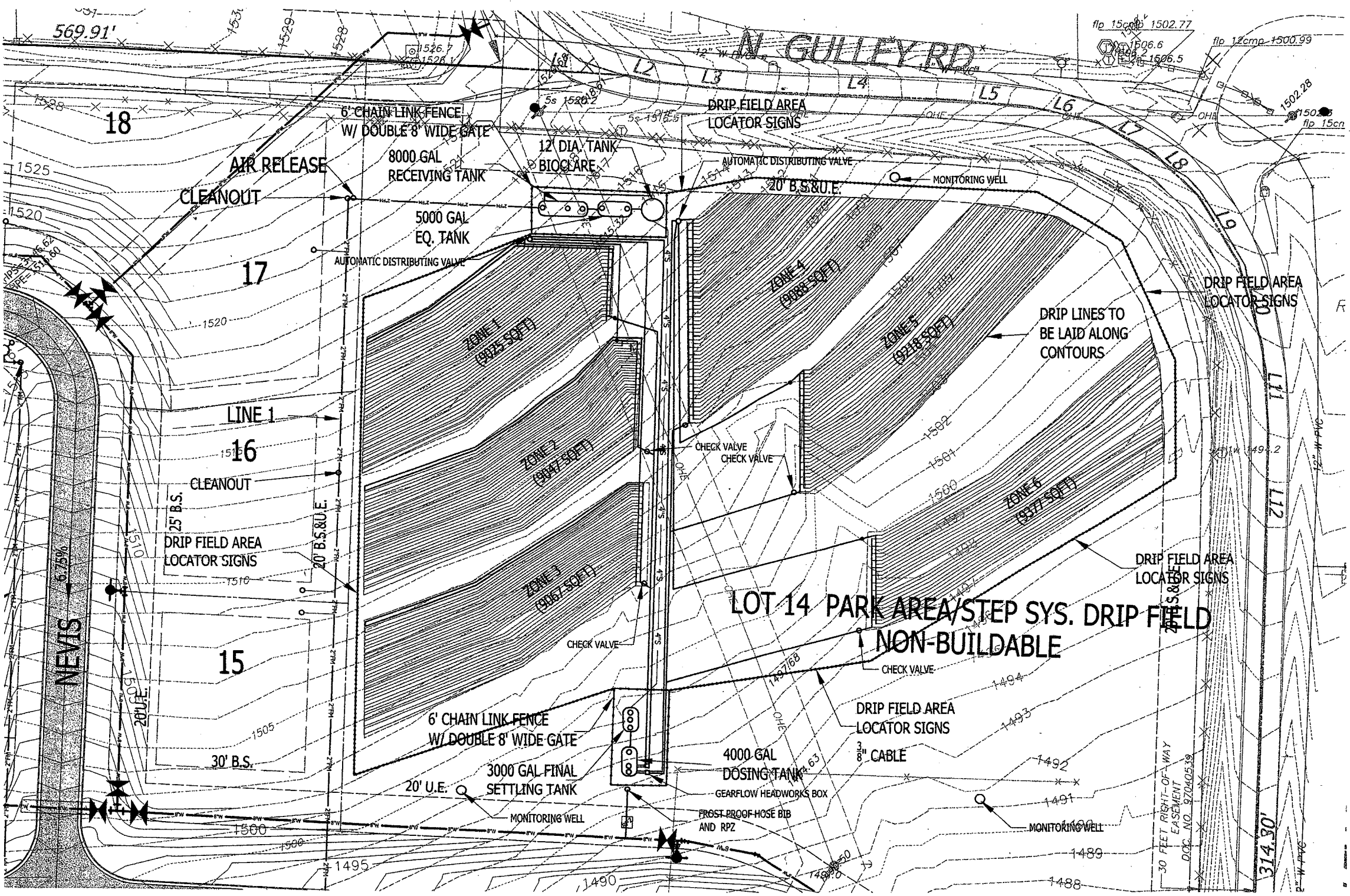
**▲ WARNING ELECTRICAL PRECAUTIONS-** Before servicing a pump, always shut off the main power breaker and then unplug the pump - making sure you are not standing in water and wearing insulated protective sole shoes. Under flooded conditions, contact your local electric company or a qualified licensed electrician for disconnecting electrical service prior to pump removal.

**▲ WARNING** Submersible pumps contain oils which becomes pressurized and hot under operating conditions - **allow 2 1/2 hours after disconnecting before attempting service.**

CONDITION	COMMON CAUSES
A. Pump will not start or run.	Check fuse, low voltage, overload open, open or incorrect wiring, open switch, impeller or seal bound mechanically, defective capacitor or relay when used, motor or wiring shorted. Float assembly held down. Switch defective, damaged, or out of adjustment.
B. Motor overheats and trips overload or blows fuse.	Incorrect voltage, impeller or seal bound mechanically.
C. Pump starts and stops too often.	Float tether length too short, check valve stuck or not installed in discharge line, overload open, level switch(s) defective.
D. Pump will not shut off.	Debris under float assembly, float or float rod obstructed, switch defective, damaged or out of adjustment.
E. Pump operates but delivers little or no water.	Check strainer housing on pump and discharge pipe must be open. Discharge head exceeds pump capacity. Low or incorrect voltage. Incoming water containing air or causing air to enter pump. Filter Clogged.
F. Drop in head and/or capacity after a period of use.	Increased pipe friction, clogged line or check valve. Abrasive material and/or adverse chemicals could possibly deteriorate impeller and pump housing. Check discharge line. Remove base and inspect pump.

If the above checklist does not uncover the problem, consult the factory - Do not attempt to service or otherwise disassemble pump.

All Clarus Environmental products must be installed and maintained in accordance with all applicable codes. Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.



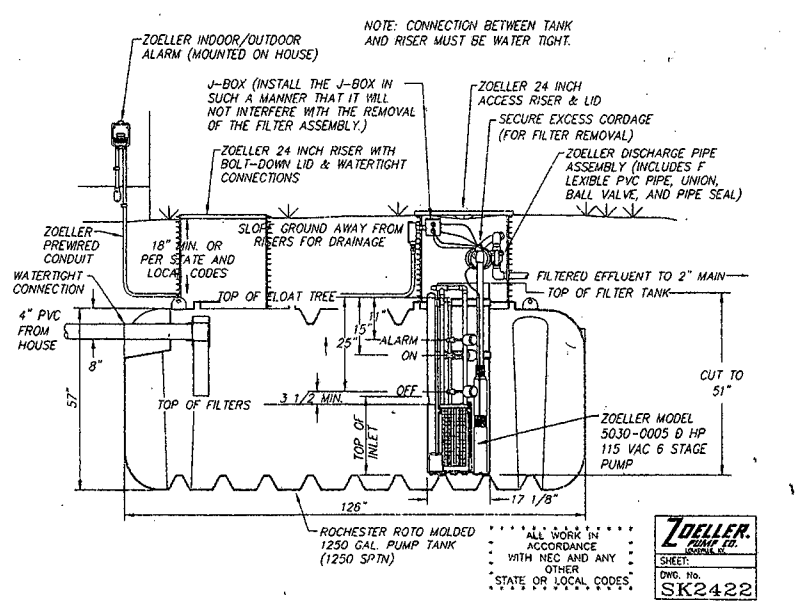
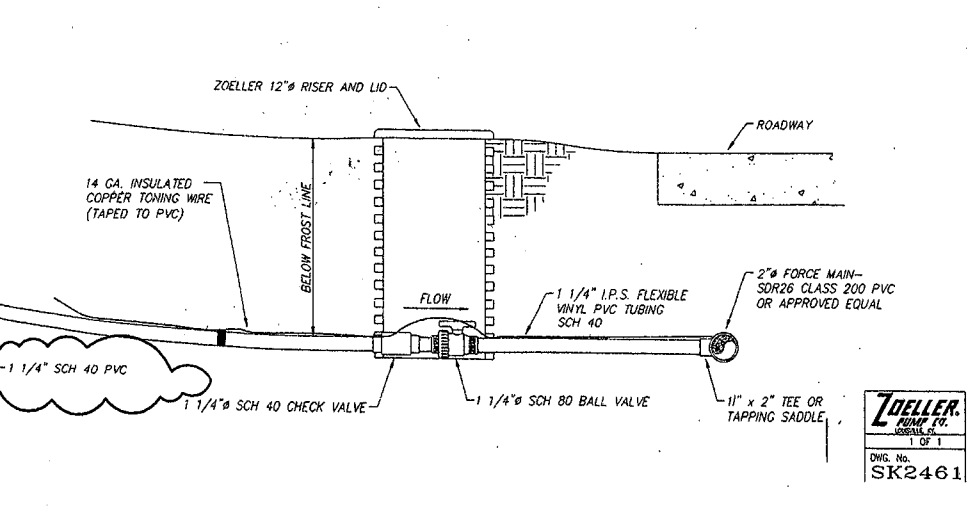
**LEGEND**

EXISTING	PROPOSED
●	IRON PIN/PIPE FOUND
○	IRON PIN SET
---	BOUNDARY LINE
---	RIGHT OF WAY LINE
---	EASEMENT LINE
---	BUILDING SETBACK LINE
---	OVERHEAD ELECTRIC
---	CHAIN LINK FENCE
---	WIRE FENCE
---	WOOD FENCE
---	WATER MAIN
---	FIRE HYDRANT (DET. FH1)
---	8" GATE VALVE
---	BLOWOFF
---	CAPPED LINE
---	SINGLE X" WATER METER
---	DOUBLE X" WATER METER
---	SEWER MAIN
---	PRESSURE SEWER
---	SERVICE (PW)
---	2" FORCE MAIN CAPPED
---	WITHIN METER BOX
---	SEWER MANHOLE
---	SEWER MANHOLE
---	TELEPHONE (UNDERGROUND)
---	TELEPHONE (OVERHEAD)
---	GAS LINE
---	GAS METER
---	STREET LIGHT
---	ELECTRIC STUB (TYP.)
---	UNDERGROUND ELECTRIC
---	MAILBOX
---	SIGN
---	UTILITY POLE
---	STORM DRAIN PIPE
---	CURB INLET
---	FLARED END SECTION
---	CURB LINE
---	ASPHALT PAVING
---	CONCRETE SIDEWALK
---	QUAD CROSSING PER DETAIL UT-7

**GENERAL NOTES:**

SEWER SYSTEM IS A PRIVATE SYSTEM AND WILL BE MAINTAINED BY THE P.O.A.

- NOTES:**
- ALL WATERLINE TO BE AWWA C900 DR-14 PVC PIPE. ALL SEWER PIPING TO BE SDR28PVC.
  - CONTRACTOR IS RESPONSIBLE TO CONTACT THE CITY OF FAYETTEVILLE WATER UTILITIES FOR OBSERVATION, PROCEDURE AND REQUIREMENTS FOR TAPPING PUBLIC WATER MAIN 48 HOURS BEFORE WORK IS TO BEGIN.
  - ALL WATER LINE CONSTRUCTION SHALL BE IN STRICT CONFORMANCE WITH THE LATEST REVISION OF THE CITY OF FAYETTEVILLE WATER UTILITY STANDARD SPECIFICATION FOR WATER AND SEWER.
  - THE NUMBER AND LOCATION OF FIRE HYDRANTS SHALL BE DETERMINED BY THE FIRE DEPARTMENT.
  - ALL CONNECTIONS TO HAVE MEGS-LUGS.

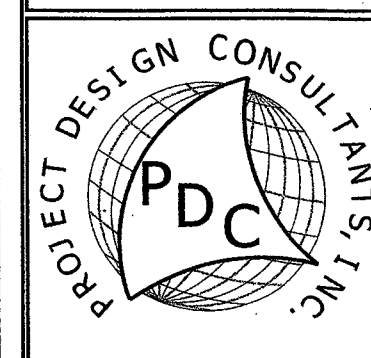


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DATE: 8/9/05

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MARK ALLAN GROSS, P.E.  
DATE: 8/9/05



130 N. MAIN ST.  
CAVE SPRINGS, AR 72718  
Ph: (479) 248-1161  
Fx: (479) 248-1462

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DRAWN BY: CRKJ	DATE: 11/2/04
APPROVED BY: NAS	DATE: 11/2/04

NO.	REVISION:	DATE:
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PROJECT:  
**SLOAN ESTATES SUBDIVISION**  
WASHINGTON CO, AR

SHEET TITLE:  
**DRIP FIELD PLAN**

SHEET NUMBER: **5.1** OF **6.3**



JOHN D. & REBECCA GINGER  
3241 N. GULLEY RD.  
FAYETTEVILLE, AR 72703  
PARCEL NO. 001-15584-000

JOHN D. & REBECCA GINGER  
3241 N. GULLEY RD.  
FAYETTEVILLE, AR 72703  
PARCEL NO. 001-15584-000

JOHN D. & REBECCA GINGER  
3241 N. GULLEY RD.  
FAYETTEVILLE, AR 72703  
PARCEL NO. 001-15496-001

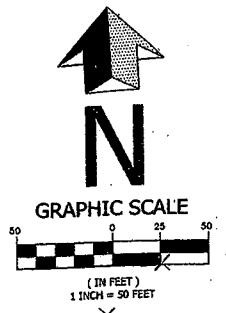
RONALD E. & ALICE M. TALBERT  
3130 N. GULLEY RD.  
FAYETTEVILLE, AR 72703  
PARCEL NO. 001-15781-000

JEFF D. & LISA K. PARKER  
5236 CABO  
FAYETTEVILLE, AR 72703  
PARCEL NO. 488-02279-000

JACK & BOB ORR, JR.  
TIE INTO EXISTING 12" WATER LINE  
12" X 8" TAPPING SLEEVE & VALVE  
THOMAS J. & CHRISTIE SIMMONS  
5211 CABO  
FAYETTEVILLE, AR 72703  
PARCEL NO. 488-02281-000

GIBBS, THERESA TUCK (TESSIE), TRUSTEE, THERESA TUCK (TESSIE) GIBBS TRUST  
3031 N GULLEY RD  
FAYETTEVILLE, AR 72703  
PARCEL NO. 001-15645-000

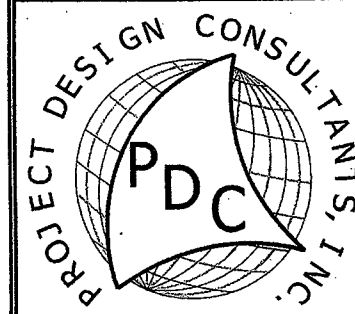
GIBBS, THERESA TUCK (TESSIE), TRUSTEE, THERESA TUCK (TESSIE) GIBBS TRUST  
3031 N GULLEY RD  
FAYETTEVILLE, AR 72703  
PARCEL NO. 001-15778-001



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DATED: 11-05-05



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CAVE SPRINGS, AR 72718  
Ph: (479) 248-1161  
Fx: (479) 248-1462

EXISTING	PROPOSED
IRON PIN/PIPE FOUND	IRON PIN SET
BOUNDARY LINE	RIGHT OF WAY LINE
EASEMENT LINE	BUILDING SETBACK LINE
CHAINLINK FENCE	OVERHEAD ELECTRIC
WIRE FENCE	WOOD FENCE
WATER MAIN	FIRE HYDRANT (DET. FH1)
8" GATE VALVE	BLOWOFF
CAPPED LINE	SINGLE X" WATER METER
DOUBLE X" WATER METER	SEWER MAIN
PRESSURE SEWER SERVICE (F#)	DOUBLE CLEANOUT (F#)
2" FORCE MAIN CAPPED	WITHIN METER BOX
SEWER MANHOLE	SEWER MANHOLE
TELEPHONE (UNDERGROUND)	TELEPHONE (OVERHEAD)
GAS LINE	GAS METER
STREET LIGHT	ELECTRIC STUB (TYP.)
UNDERGROUND ELECTRIC	MAILBOX
SIGN	UTILITY POLE
STORM DRAIN PIPE	CURB INLET
FLARED END SECTION	CURB LINE
ASPHALT PAVING	CONCRETE SIDEWALK
QUAD CROSSING PER DETAIL UT-7	

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- THE NUMBER AND LOCATION OF FIRE HYDRANTS SHALL BE DETERMINED BY THE FIRE DEPARTMENT.
- ALL CONNECTIONS TO HAVE MEGS-LUGS.
- ALL WATER AND SEWER MAINS SHALL BE SEPARATED BY 18" HORIZ. AND 10" VERTICAL.

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DRAWN BY: CRKJ	DATE: 11/30/05
APPROVED BY: NAS	DATE:

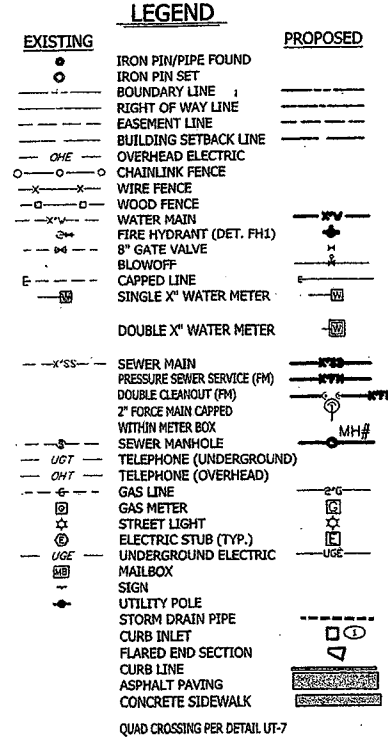
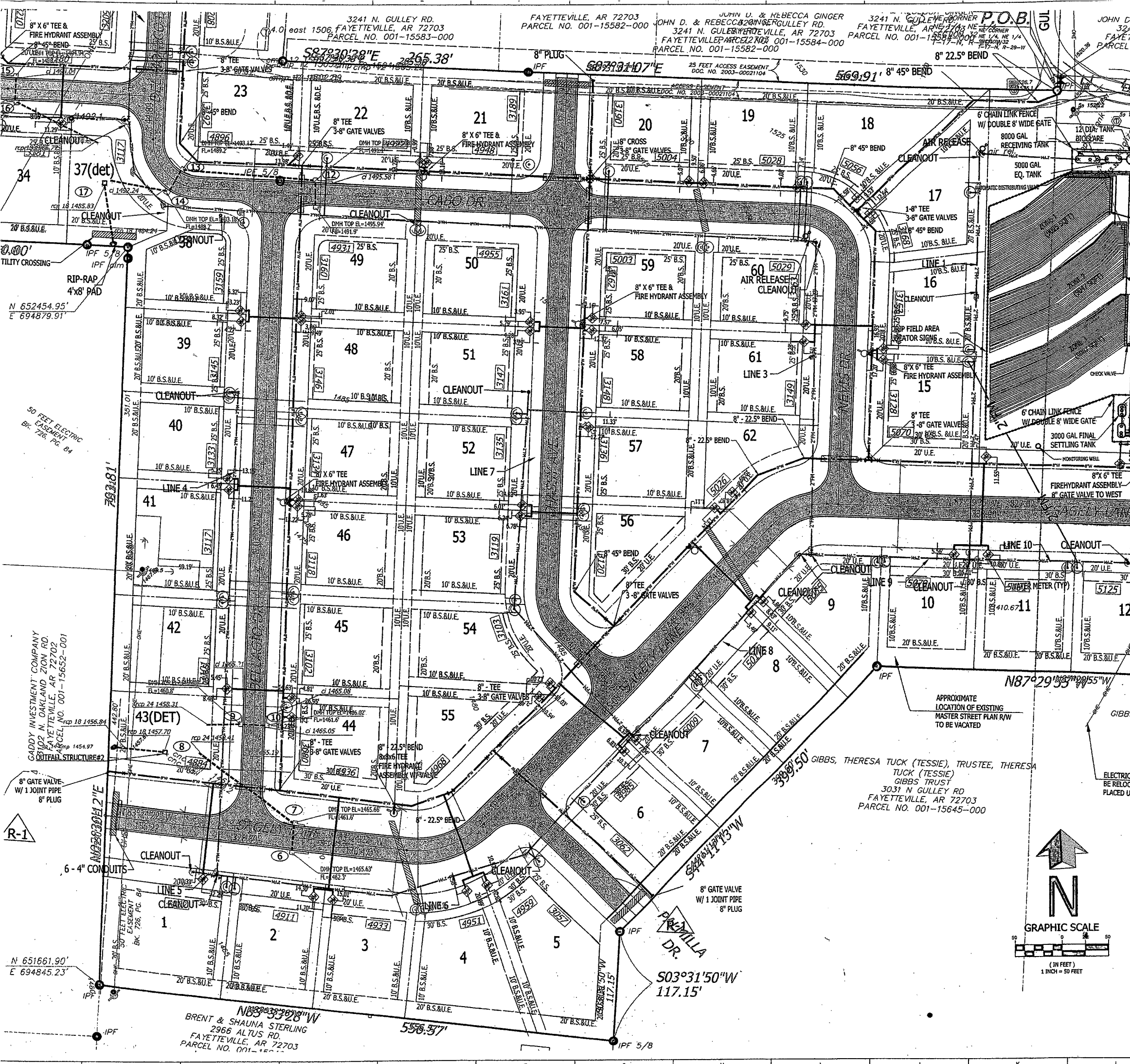
NO.	REVISION	DATE

PROJECT:  
**SLOAN ESTATES  
SUBDIVISION**  
WASHINGTON CO, AR

SHEET TITLE:  
**AS BUILT  
UTILITY PLAN  
(EAST)**

SHEET NUMBER:  
**5.0A** OF

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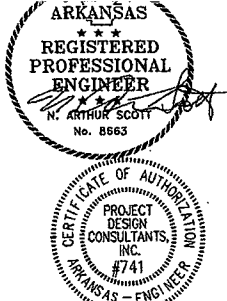
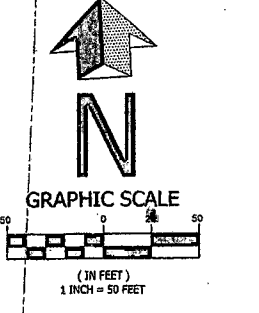


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**SEWER SYSTEM IS A PRIVATE SYSTEM AND WILL BE MAINTAINED BY THE P.O.A.**

- NOTES:
1. ALL WATERLINE TO BE AWWA C900 DR-14 PVC PIPE. ALL SEWER PIPING TO BE SDR21 PV.
  2. CONTRACTOR IS RESPONSIBLE TO CONTACT THE CITY OF FAYETTEVILLE WATER UTILITIES FOR OBSERVATION, PROCEDURE AND REQUIREMENTS FOR TAPPING PUBLIC WATER MAIN 48 HOURS BEFORE WORK IS TO BEGIN.
  3. ALL WATER LINE CONSTRUCTION SHALL BE IN STRICT CONFORMANCE WITH THE LATEST REVISION OF THE CITY OF FAYETTEVILLE WATER UTILITY STANDARD SPECIFICATION FOR WATER AND SEWER.
  4. THE NUMBER AND LOCATION OF FIRE HYDRANTS SHALL BE DETERMINED BY THE FIRE DEPARTMENT.
  5. ALL CONNECTIONS TO HAVE MEGS-LUGS.
  6. ALL WATER AND SEWER MAINS SHALL BE SEPARATED BY 18\"/>

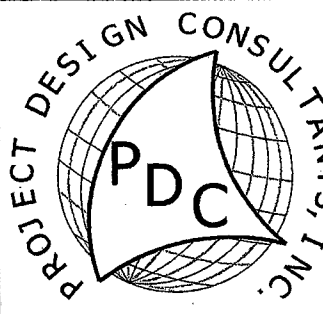
APPROXIMATE LOCATION OF EXISTING MASTER STREET PLAN R/W TO BE VACATED

GIBBS, THERESA TUCK (TESSIE), TRUSTEE, THERESA TUCK (TESSIE) GIBBS TRUST  
 3031 N GULLEY RD  
 FAYETTEVILLE, AR 72703  
 PARCEL NO. 001-15645-000



DATE: 11/30/05

**RECORD DRAWING**  
 THIS RECORD DOCUMENT HAS BEEN PREPARED BASED ON THE BEST AVAILABLE INFORMATION. THE ACCURACY AND/OR COMPLETENESS OF THIS INFORMATION HAS NOT BEEN NECESSARILY VERIFIED AND PDC INC. SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.  
 DATED: 11-05-05



130 N. MAIN ST.  
 CAVE SPRINGS, AR 72718  
 Ph: (479) 248-1161  
 Fx: (479) 248-1462

SCALE: 1"=50'	PROJECT NO.: 2004-015
DRAWN BY: CRKJ	DATE: 11/30/05
APPROVED BY: NAS	DATE:

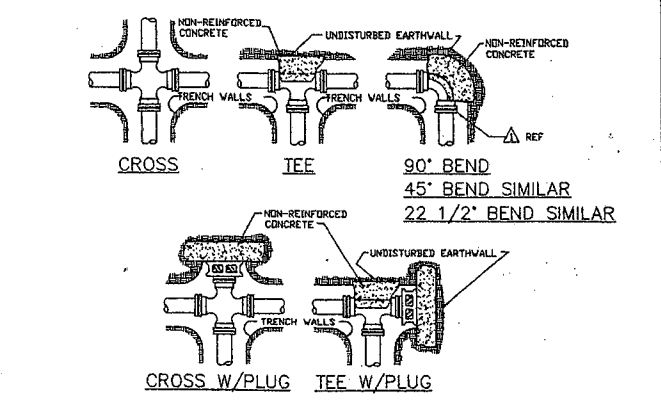
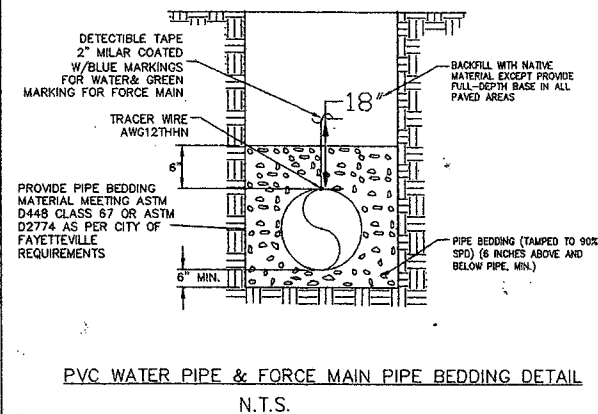
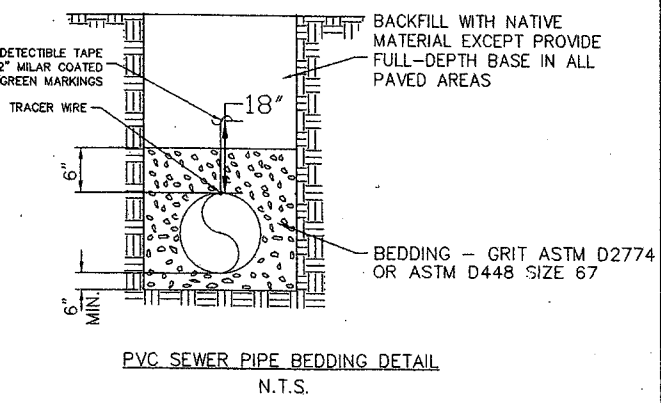
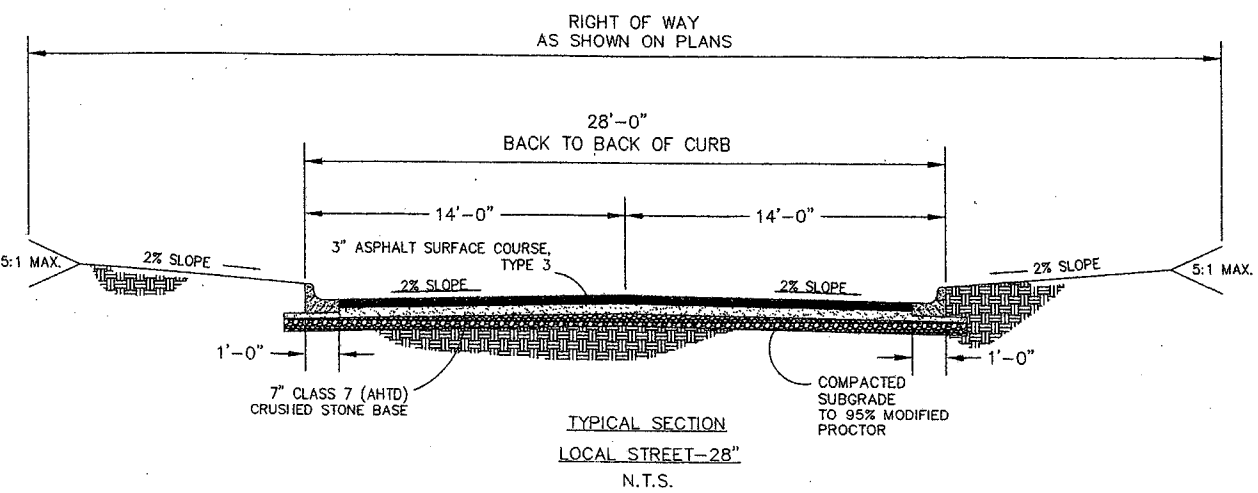
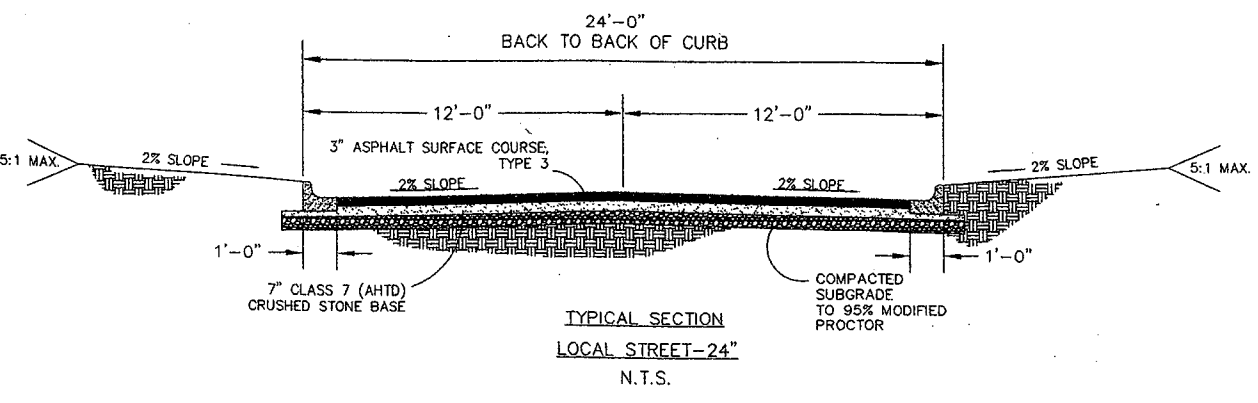
NO.	REVISION	DATE

PROJECT:  
**SLOAN ESTATES  
 SUBDIVISION**  
 WASHINGTON CO, AR

SHEET TITLE:  
**AS BUILT  
 UTILITY PLAN**

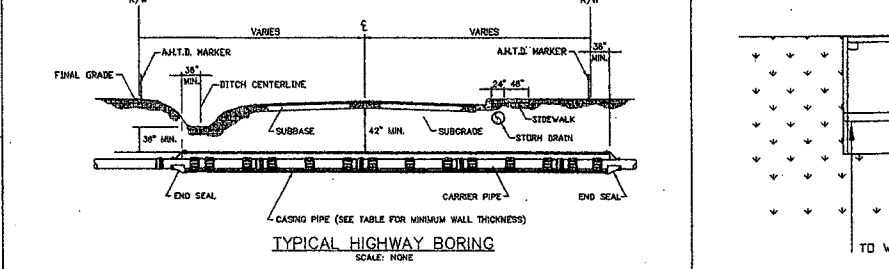
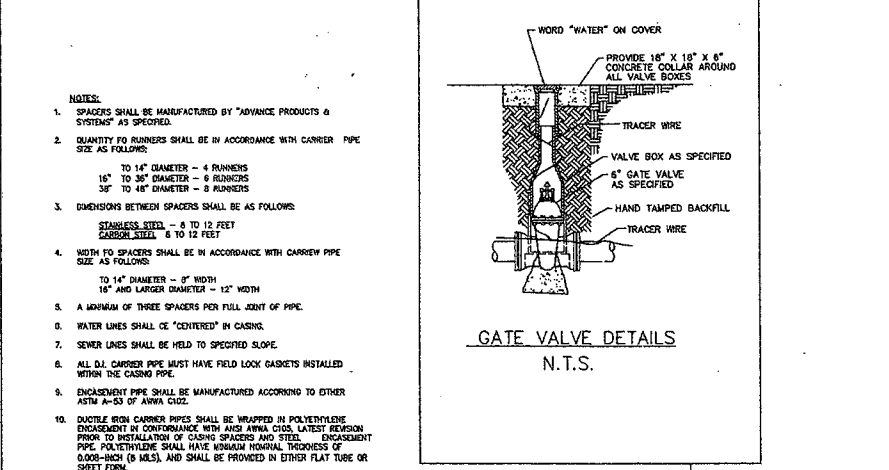
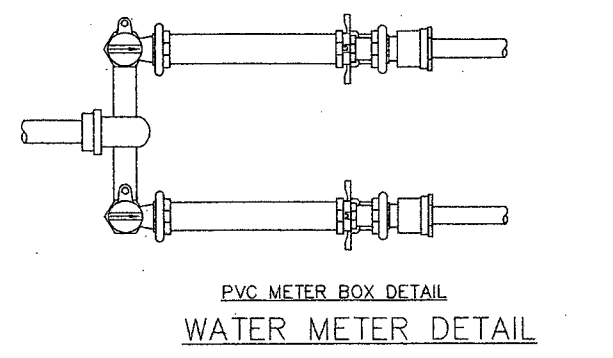
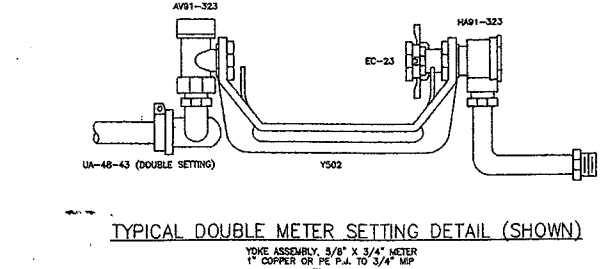
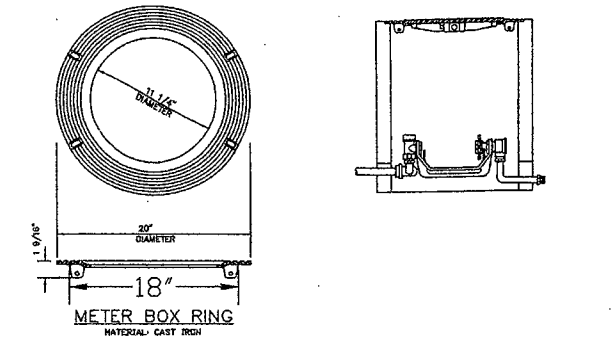
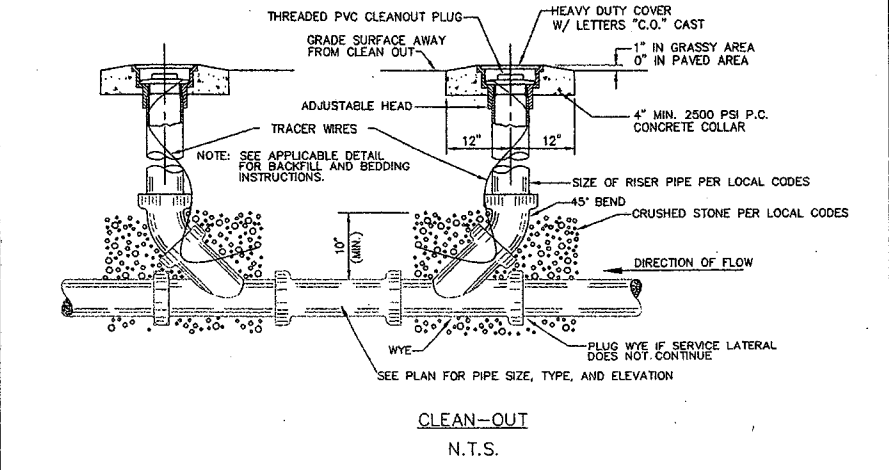
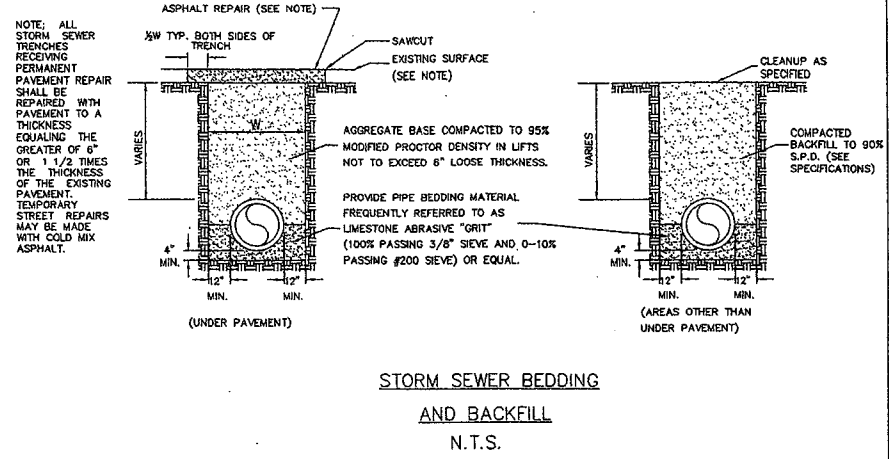
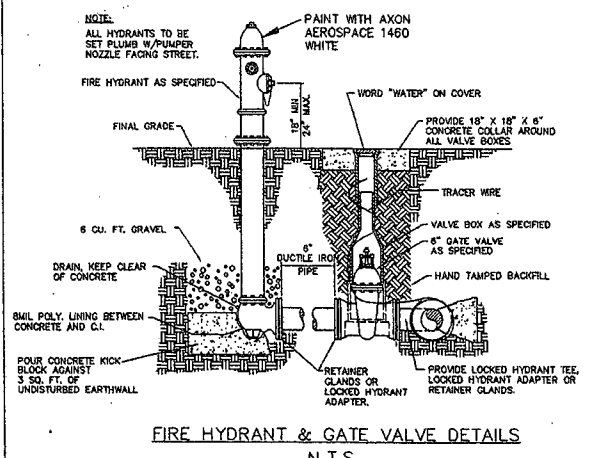
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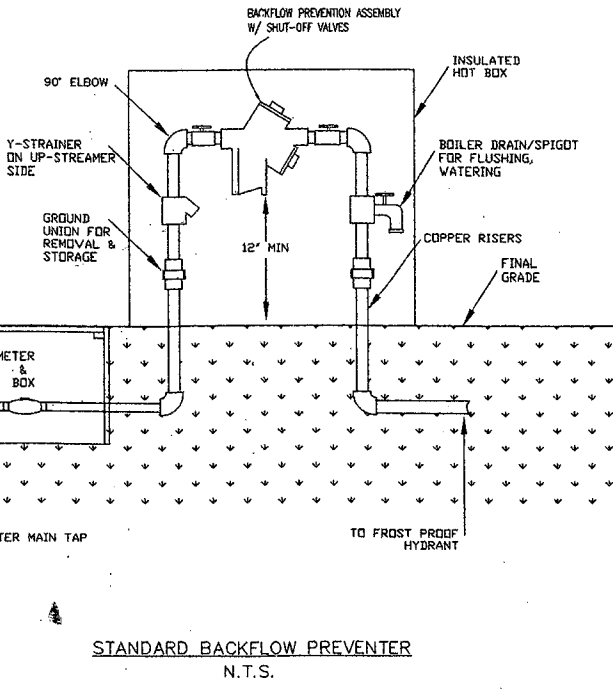
**REACTION BACKING TABLE**

SIZE	REQUIRED SQ. FT. OF UNDISTURBED EARTH WALL FOR REACTION BACKING			
	90°	45°	22 1/2°	
2"	1	1	1	1
3"	1	1	1	1
4"	1	1	1	1
6"	2	2	2	2
8"	3	3	3	3
10"	4	4	4	4
12"	7	7	7	7
14"	10	10	10	10
16"	13	13	13	13
18"	17	17	17	17
20"	21	21	21	21
24"	28	28	28	28
30"	38	38	38	38
36"	50	50	50	50



**ENCASMENT / CARRIER PIPE SIZING CHART**  
DUCTILE IRON OF C900 PVC MAINS

CARRIER	CARRIER & CASING SIZES									
	4"	6"	8"	12"	16"	18"	20"	24"	36"	48"
CASING	12"	12"	18"	24"	24"	30"	36"	36"	48"	60"
CASING/WALL THICKNESS	.250	.250	.250	.250	.250	.312	.312	.312	.375	.375
ASTM / AWWA SPECIFICATION	ASTM A53	ASTM A53	AWWA C102	AWWA C102	AWWA C102	AWWA C102	AWWA C102	AWWA C102	AWWA C102	AWWA C102



SEAL:

STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
N. ARTHUR SCOTT  
No. 8863

CERTIFICATE OF AUTHORIZATION  
PROJECT DESIGN CONSULTANTS, INC.  
#741  
ARKANSAS - ENGINEER

DATE: 8/5/05

This drawing is "PRELIMINARY - NOT FOR CONSTRUCTION" until above seal holder acknowledges the Cancellation of this disclaimer below:

*N. Arthur Scott*  
N. Arthur Scott, P.E.

DATE: 8/5/05

SCALE: N.T.S.	PROJECT NO.: 2004015
DRAWN BY: V.S.	DATE: 2/22/05
APPROVED BY: NAS	DATE: ---

NO.	REVISION:	DATE:
	PER ADH COMMENTS 3/29/05	4/08/05
BY: VS		
BY:		
BY:		
BY:		
BY:		

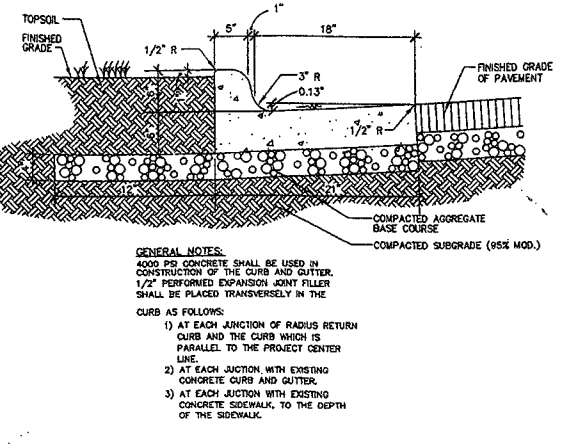
PROJECT DESIGN CONSULTANTS, INC.  
PDC  
CIVIL ENGINEERS  
130 N. MAIN STREET  
CAVE SPRINGS, AR 72718  
479-248-1161

STATE OF ARKANSAS  
COUNTY OF WASHINGTON  
CITY OF FAYETTEVILLE

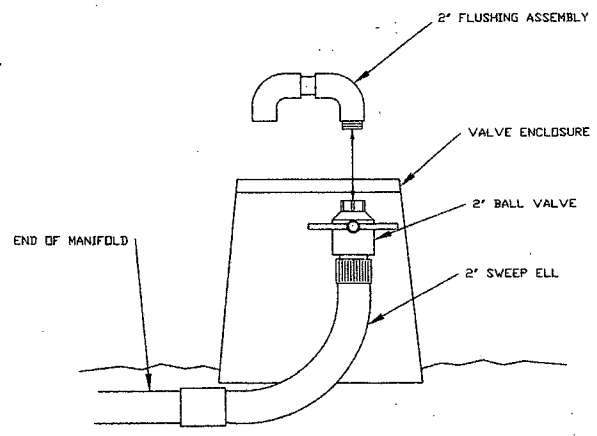
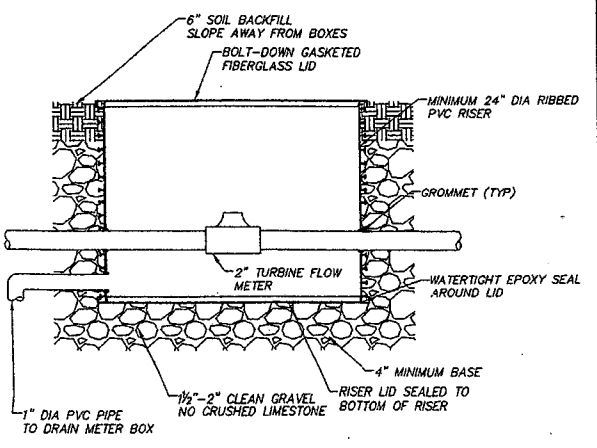
DETAIL SHEET FOR SLOAN ESTATES

CALL BEFORE YOU DIG  
800-457-3008  
ARKANSAS ONE CALL SYSTEM

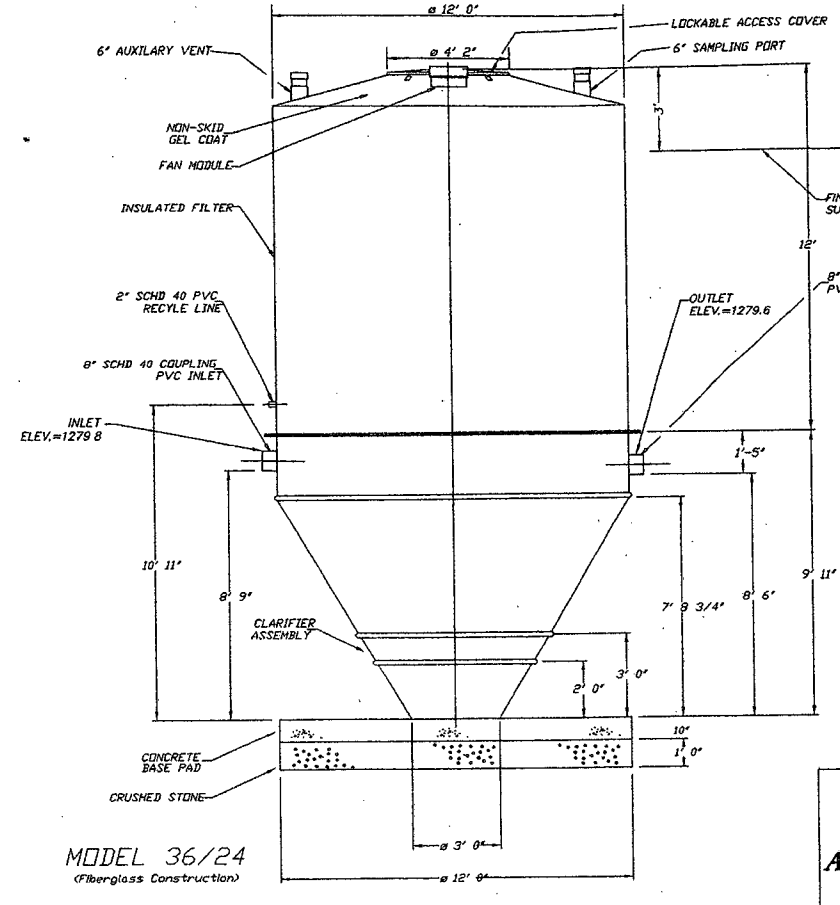
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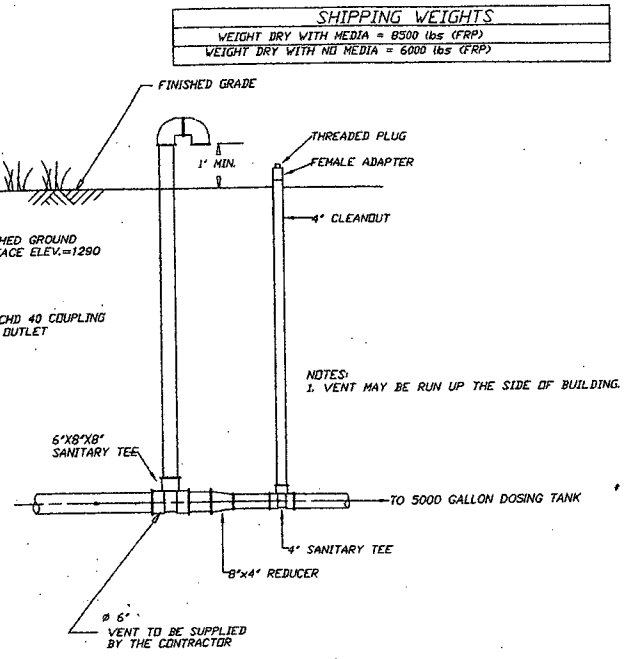
**CONCRETE CURB AND GUTTER**  
N.T.S.



**DRIP MANIFOLD CLEANOUT**  
N.T.S.



**MODEL 36/24**  
(Fiberglass Construction)



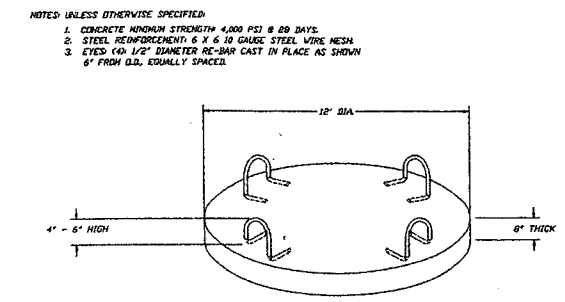
SHIPPING WEIGHTS	
WEIGHT DRY WITH MEDIA	= 8300 lbs (FRP)
WEIGHT DRY WITH NO MEDIA	= 6000 lbs (FRP)

**DISTRIBUTION STATEMENT**  
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**AWT Aquapoint**  
241 DUCHAINE BLVD.  
P.O. BOX 50120  
NEW BEDFORD, MA 02745  
(508) 998-7577 FAX (508) 998-7177

NO.	REVISION	DATE
	PER ADH COMMENTS 3/29/05	4/08/05
BY:	VS	
BY:		
BY:		
BY:		
BY:		

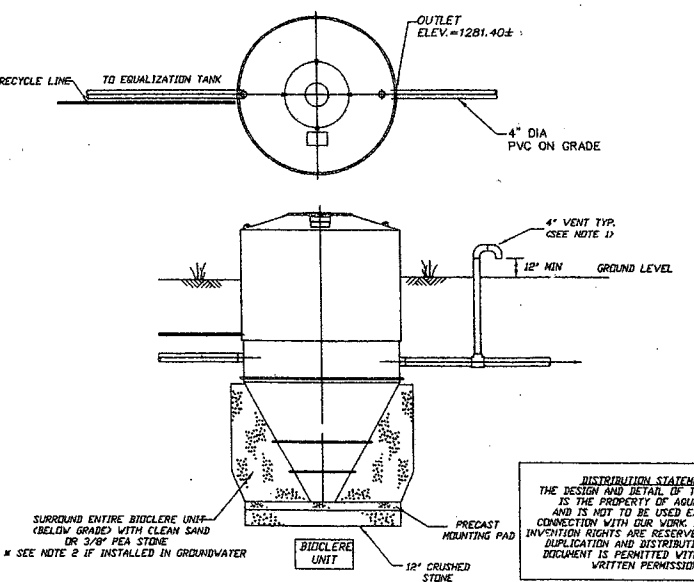
BIDCLERE 12" DIA BIODIFFUSER  
GENERAL ARRANGEMENT MODEL 36/30  
DRAWING NO. UK.1263-4  
REVISION: C  
DATE: 01/19/01  
DWN BY: P.Willey  
SCALE: NTS SIZE: B  
SHEET # 1 of 1



**PRECAST MOUNTING PAD FOR BIODIFFUSER MODEL 36/30 (12" DIAMETER)**

**AWT Aquapoint**  
241 DUCHAINE BLVD.  
P.O. BOX 50120  
NEW BEDFORD, MA 02745  
(508) 998-7577 FAX (508) 998-7177

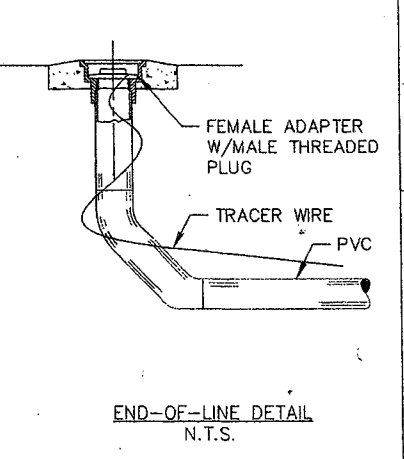
TITLE	PRECAST MOUNTING PAD
DRAWING NO.	UK.1263-4
REVISION	C
DATE	01/19/01
DWN BY	P.Willey
SCALE	NTS
SIZE	B
SHEET #	1 of 1



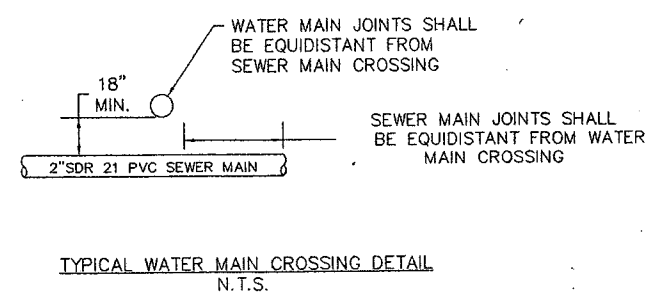
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**AWT Aquapoint**  
241 DUCHAINE BLVD.  
P.O. BOX 50120  
NEW BEDFORD, MA 02745  
(508) 998-7577 FAX (508) 998-7177

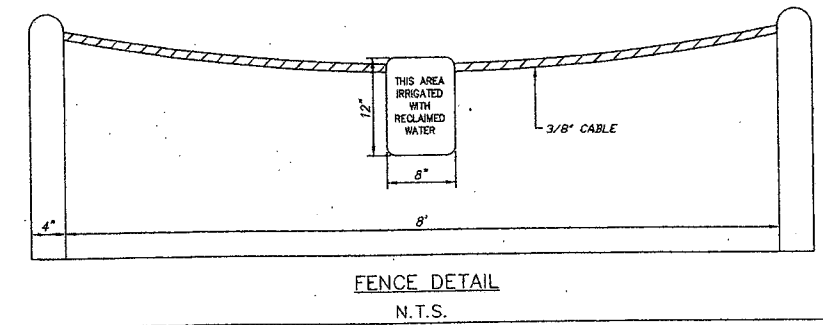
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DRAWING NO.	UK.1265-13
REVISION	A
DATE	8/29/01
DWN BY	P.WILLEY
SCALE	NTS
SIZE	B / A3
SHEET #	1 of 1



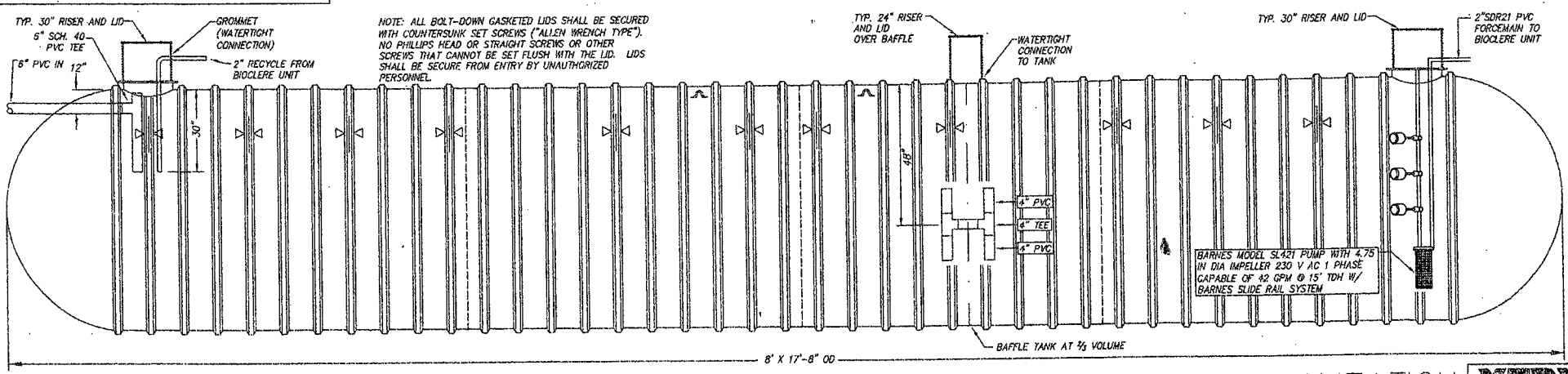
**END-OF-LINE DETAIL**  
N.T.S.



**TYPICAL WATER MAIN CROSSING DETAIL**  
N.T.S.



**FENCE DETAIL**  
N.T.S.



**EQUALIZATION TANK**

**XERXES CORPORATION**  
8" DIA. SINGLE-WALL  
CAP. 5,000 GALLONS  
DATE 5/02 DR. NO. S10-985

SEAL:

DATE: 2/9/05

SCALE:	N.T.S.	PROJECT NO.:	2004015
DRAWN BY:	V.S.	DATE:	2/22/05
APPROVED BY:	NAS	DATE:	

NO.	REVISION	DATE
	PER ADH COMMENTS 3/29/05	4/08/05
BY:	VS	
BY:		
BY:		
BY:		
BY:		



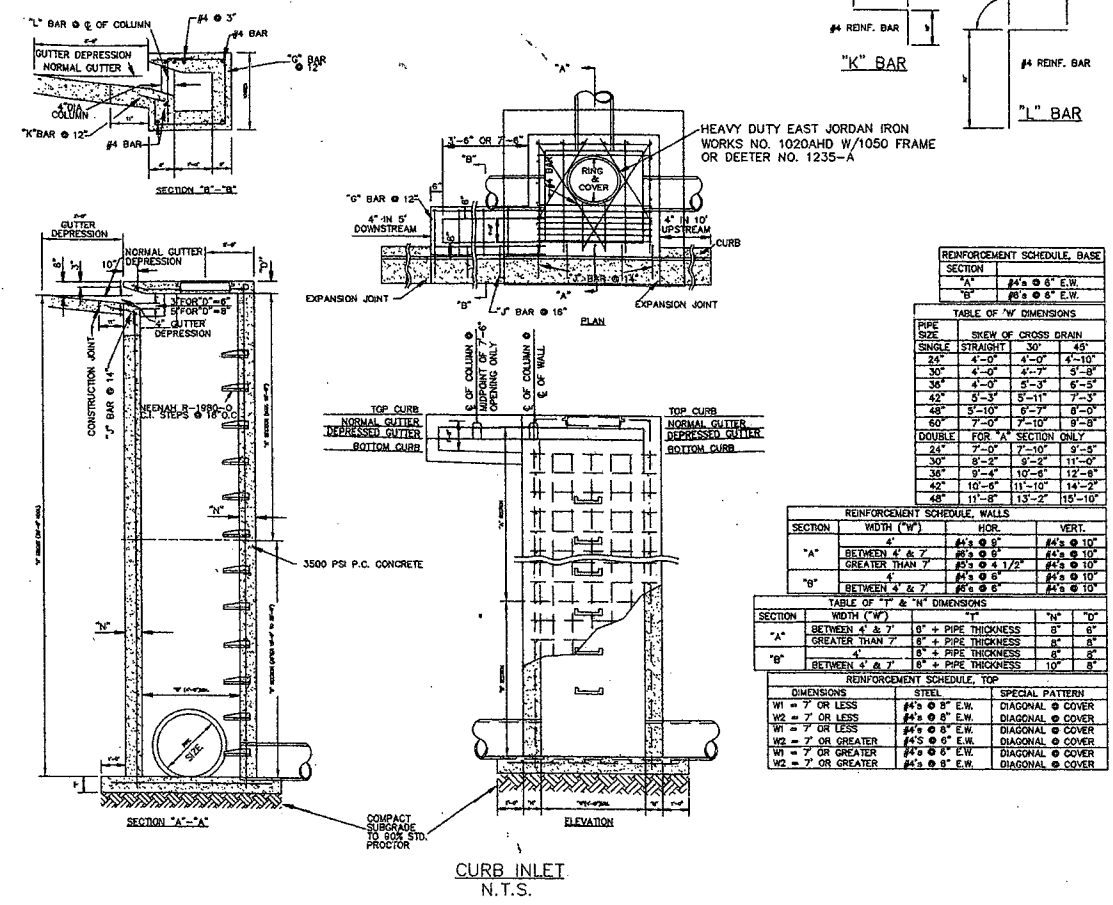
STATE OF ARKANSAS  
COUNTY OF WASHINGTON  
CITY OF FAYETTEVILLE

DETAIL SHEET FOR SLOAN ESTATES



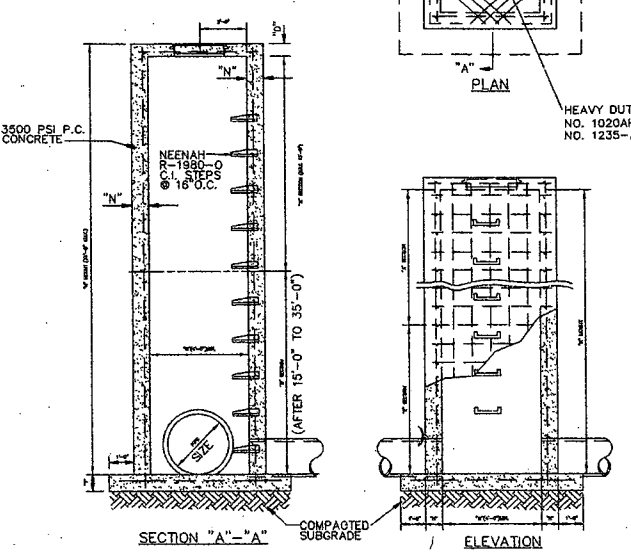


REQUIRED ON ALL DROP INLETS WITH GREATER THAN (4) FOUR FEET DEPTH.  
GENERAL NOTES:  
1. ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFER  
2. ALL #4 & #5 REINFORCING BARS TO HAVE 1-1/2" COVER, LARGER SIZES TO HAVE 2" COVER.  
3. SEE GRADING AND DRAINAGE PLAN FOR PIPE SIZES, LOCATIONS, AND FLOW LINES.  
4. PIPES SHALL CONNECT TO THE ENDS OR SIDES OF THE INLET. CONNECTION SHALL NOT BE MADE AT CORNERS OF INLET.  
5. ALL REINFORCING BARS TO BE GRADE 60.

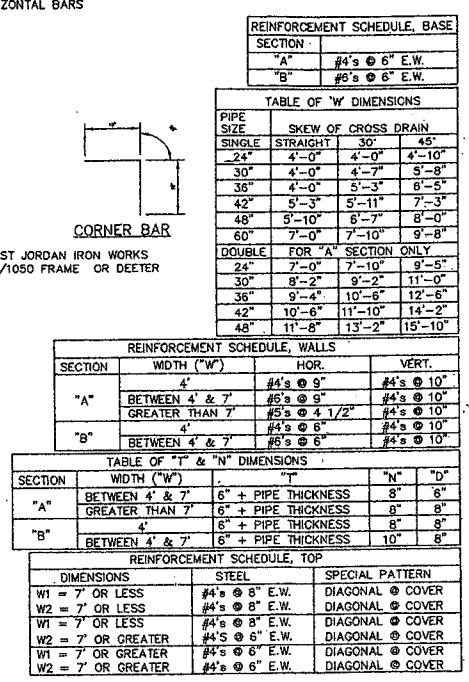


CURB INLET  
N.T.S.

GENERAL NOTES:  
1. ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFER  
2. ALL #4 & #5 REINFORCING BARS TO HAVE 1-1/2" COVER, LARGER SIZES TO HAVE 2" COVER.  
3. SEE GRADING AND DRAINAGE PLAN FOR PIPE SIZES, LOCATIONS, AND FLOW LINES.  
4. PIPES SHALL CONNECT TO THE ENDS OR SIDES OF THE INLET. CONNECTION SHALL NOT BE MADE AT CORNERS OF BOX.  
5. ALL REINFORCING BARS TO BE GRADE 60.

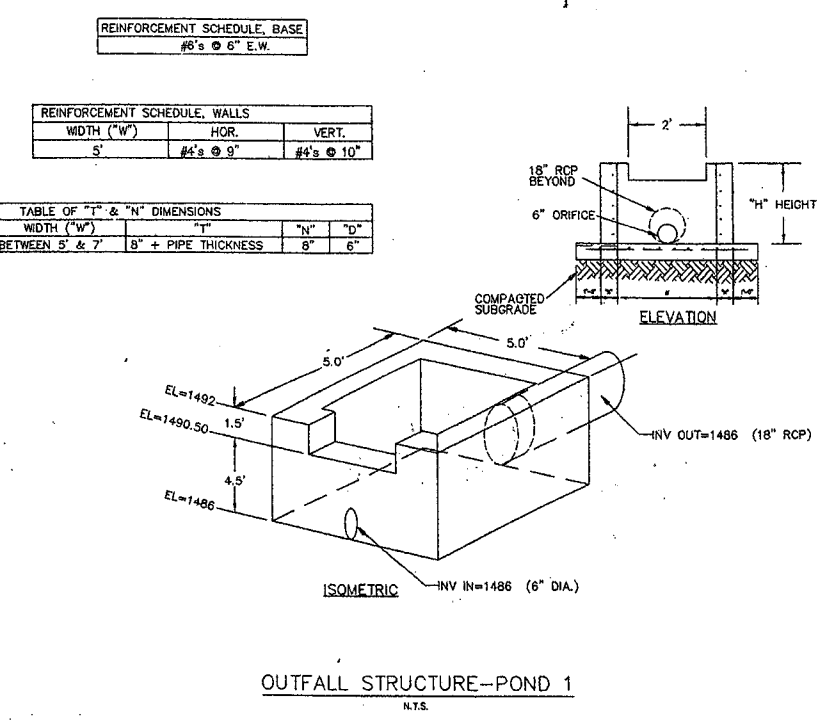


JUNCTION BOX  
N.T.S.



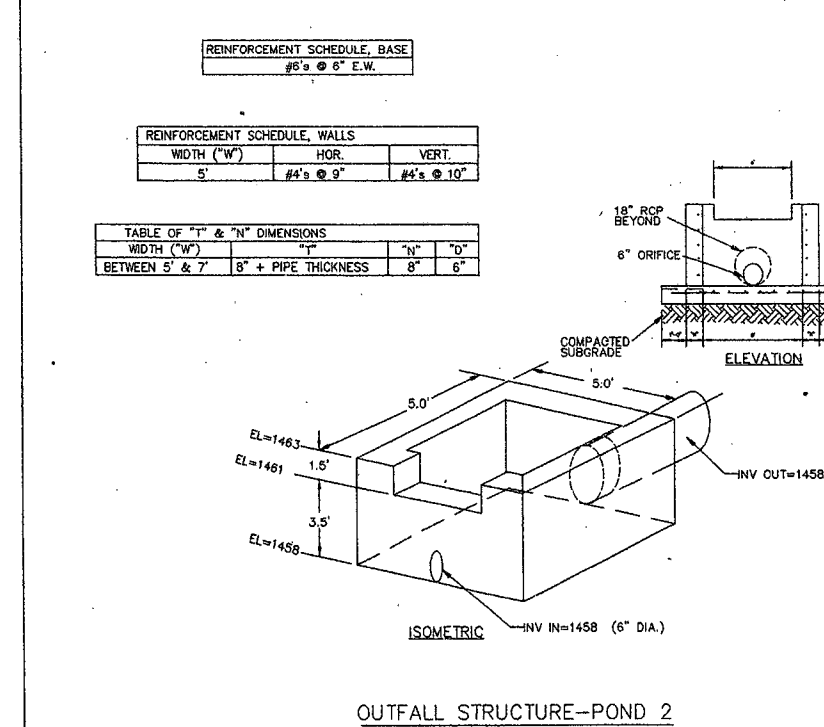
MONITORING WELL  
N.T.S.

GENERAL NOTES:  
1. ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFER  
2. ALL #4 & #5 REINFORCING BARS TO HAVE 3" CLEAR COVER, LARGER SIZES TO HAVE 2" COVER.  
3. SEE GRADING AND DRAINAGE PLAN FOR PIPE SIZES, LOCATIONS, AND FLOW LINES.  
4. PIPES SHALL CONNECT TO SIDES OF THE INLET. CONNECTION SHALL NOT BE MADE AT CORNERS OF BOX.  
5. ALL REINFORCING BARS TO BE GRADE 60.  
6. CONCRETE SHALL ATTAIN F'c=3500 PSI MIN. STRENGTH @28 DAYS.  
7. DESIGN OF BOX SHALL BE PER MANUFACTURE.



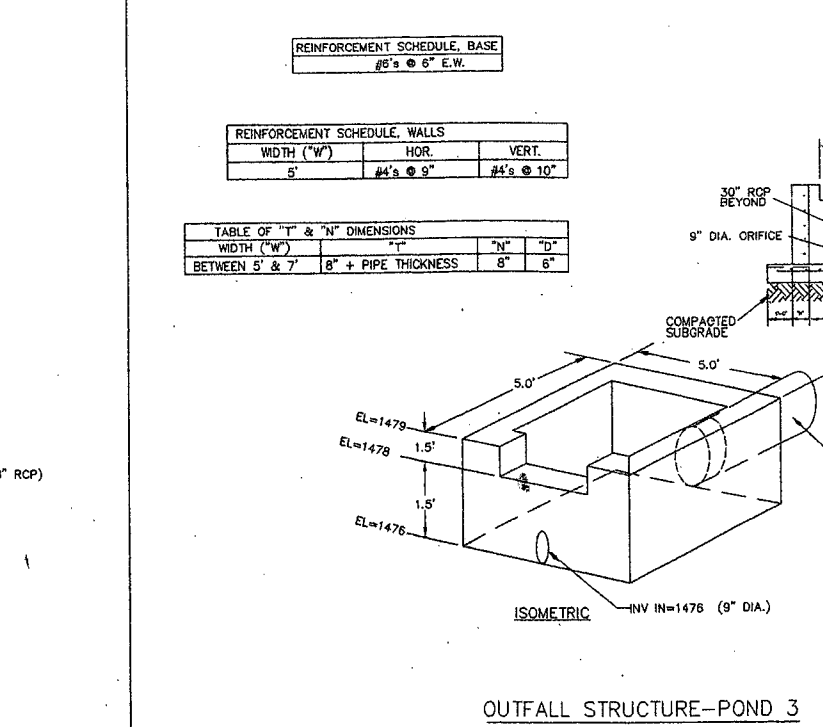
OUTFALL STRUCTURE--POND 1  
N.T.S.

GENERAL NOTES:  
1. ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFER  
2. ALL #4 & #5 REINFORCING BARS TO HAVE 3" CLEAR COVER, LARGER SIZES TO HAVE 2" COVER.  
3. SEE GRADING AND DRAINAGE PLAN FOR PIPE SIZES, LOCATIONS, AND FLOW LINES.  
4. PIPES SHALL CONNECT TO SIDES OF THE INLET. CONNECTION SHALL NOT BE MADE AT CORNERS OF BOX.  
5. ALL REINFORCING BARS TO BE GRADE 60.  
6. CONCRETE SHALL ATTAIN F'c=3500 PSI MIN. STRENGTH @28 DAYS.  
7. DESIGN OF BOX SHALL BE PER MANUFACTURE.



OUTFALL STRUCTURE--POND 2  
N.T.S.

GENERAL NOTES:  
1. ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFER  
2. ALL #4 & #5 REINFORCING BARS TO HAVE 3" CLEAR COVER, LARGER SIZES TO HAVE 2" COVER.  
3. SEE GRADING AND DRAINAGE PLAN FOR PIPE SIZES, LOCATIONS, AND FLOW LINES.  
4. PIPES SHALL CONNECT TO SIDES OF THE INLET. CONNECTION SHALL NOT BE MADE AT CORNERS OF BOX.  
5. ALL REINFORCING BARS TO BE GRADE 60.  
6. CONCRETE SHALL ATTAIN F'c=3500 PSI MIN. STRENGTH @28 DAYS.  
7. DESIGN OF BOX SHALL BE PER MANUFACTURE.



OUTFALL STRUCTURE--POND 3  
N.T.S.

SEAL:  
STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
No. 8663  
PROJECT DESIGN CONSULTANTS, INC.  
#741  
OKLAHOMA - ENGINEER  
DATE: 8/5/05

This drawing is "PRELIMINARY - NOT FOR CONSTRUCTION" until above seal holder acknowledges the Cancellation of this disclaimer below:

N. Arthur Scott, P.E.  
DATE: 8/5/05

SCALE: N.T.S. PROJECT NO.: 2004015  
DRAWN BY: V.S. DATE: 2/22/05  
APPROVED BY: NAS DATE: ---

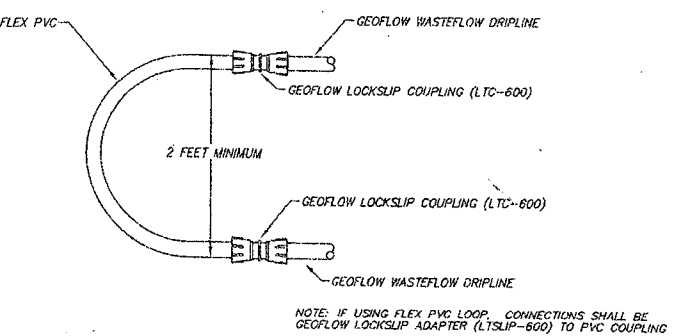
NO.	REVISION:	DATE:
	PER ADH COMMENTS 3/29/05	4/02/05
BY: VS		
BY:		
BY:		
BY:		
BY:		

PROJECT DESIGN CONSULTANTS, INC.  
PDC  
CIVIL ENGINEERS  
130 N. MAIN STREET  
CAVE SPRINGS, AR 72718  
479-248-1161

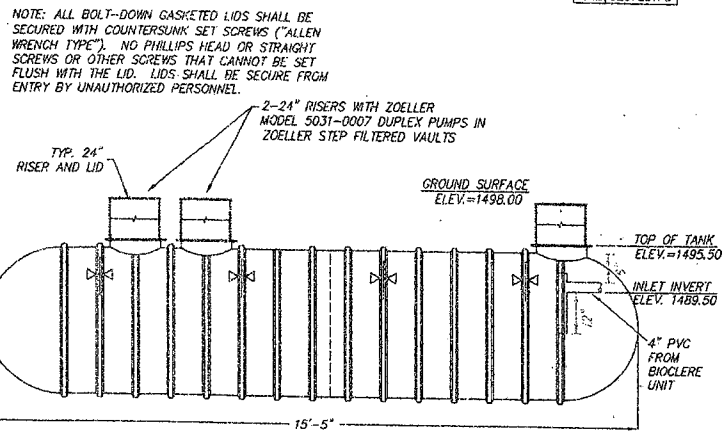
STATE OF ARKANSAS  
COUNTY OF WASHINGTON  
CITY OF FAYETTEVILLE

DETAIL SHEET FOR SLOAN ESTATES

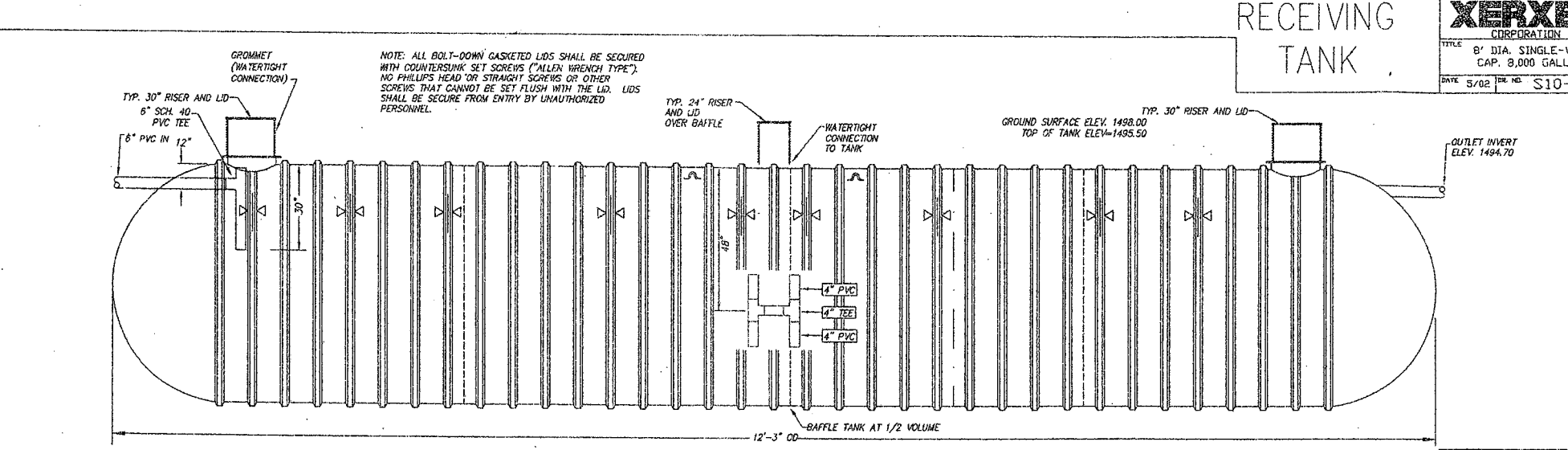
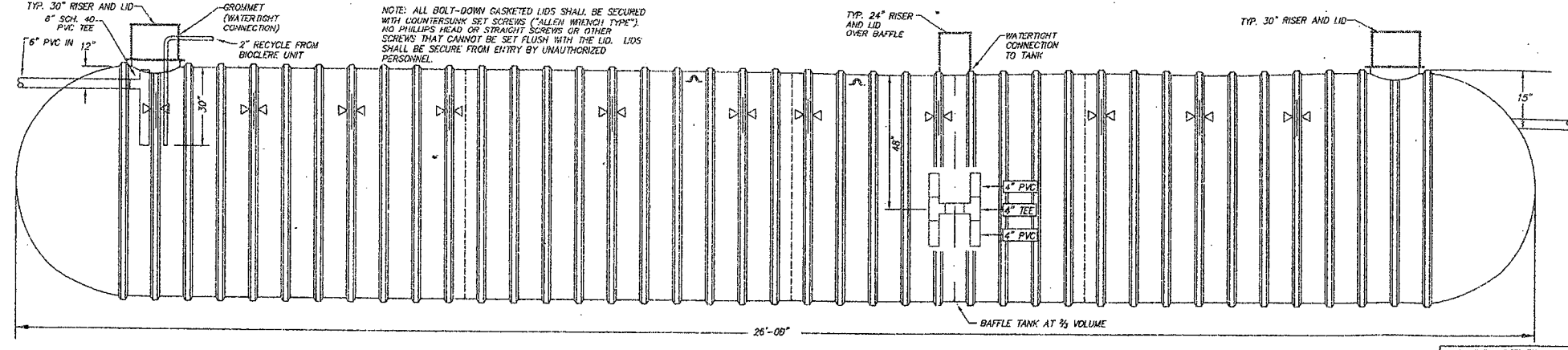
SHEET NUMBER: 6.2 OF 6.3



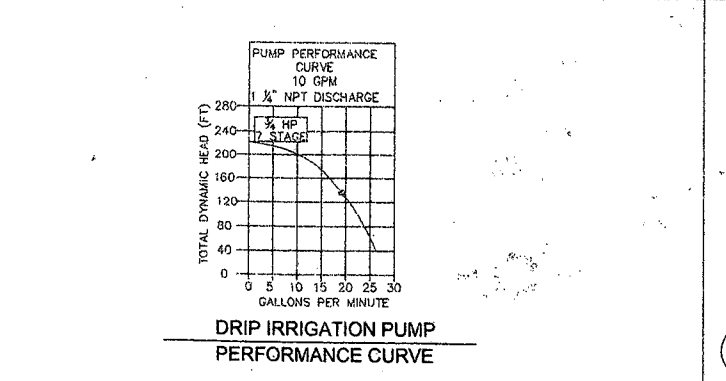
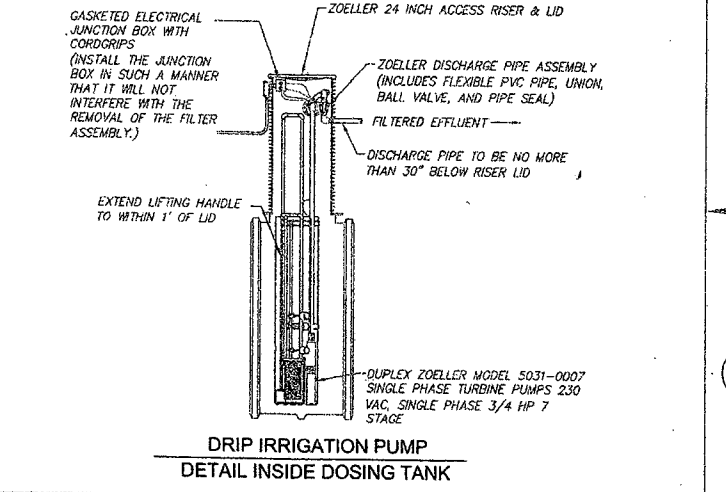
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 Not To Scale  
 08-02 | GEOFLOW



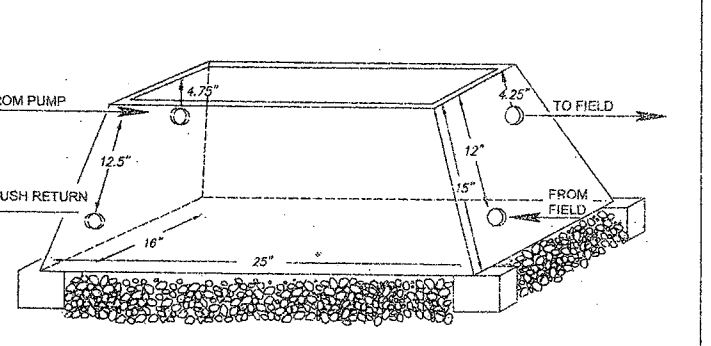
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**XERXES** CORPORATION  
 TITLE: 8" DIA. SINGLE-WALL CAP, 4,000 GALLONS  
 DATE: 5/02 DR. NO. S10-968



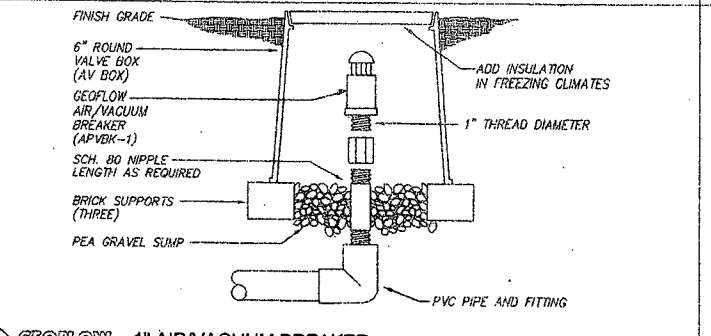
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**XERXES** CORPORATION  
 TITLE: 8" DIA. SINGLE-WALL CAP, 3,000 GALLONS  
 DATE: 5/02 DR. NO. S10-985



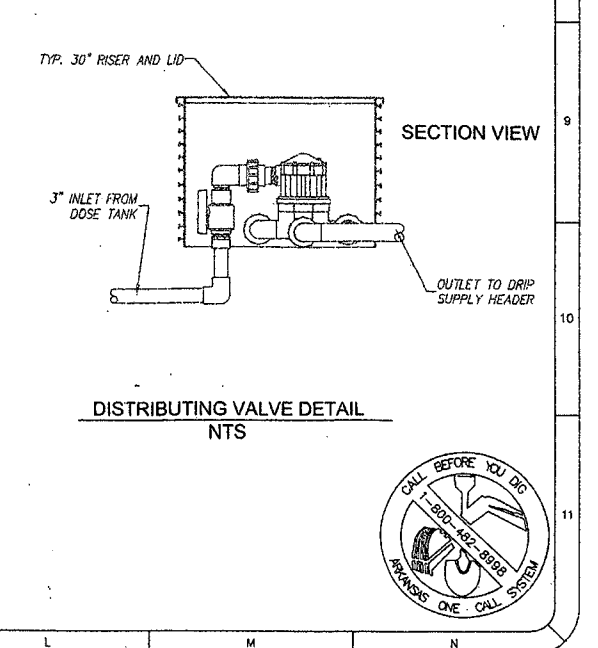
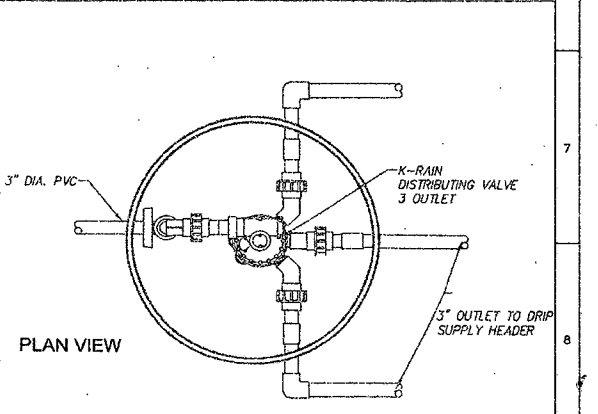
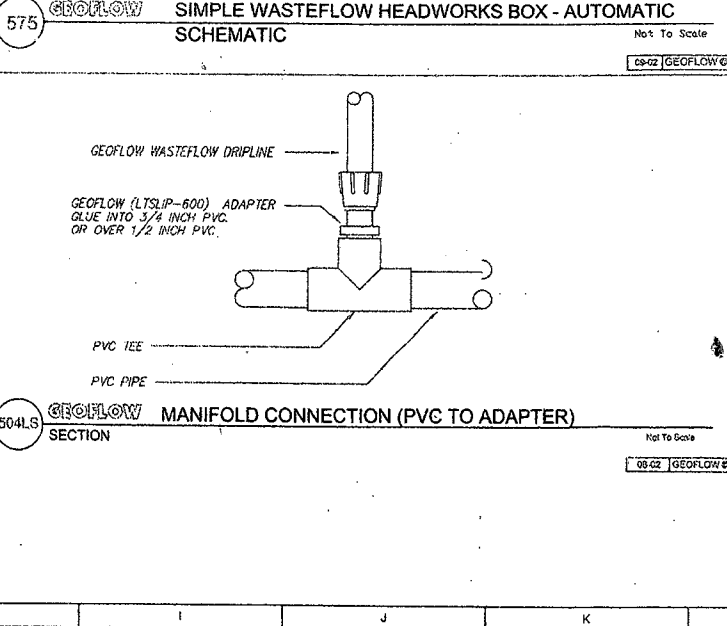
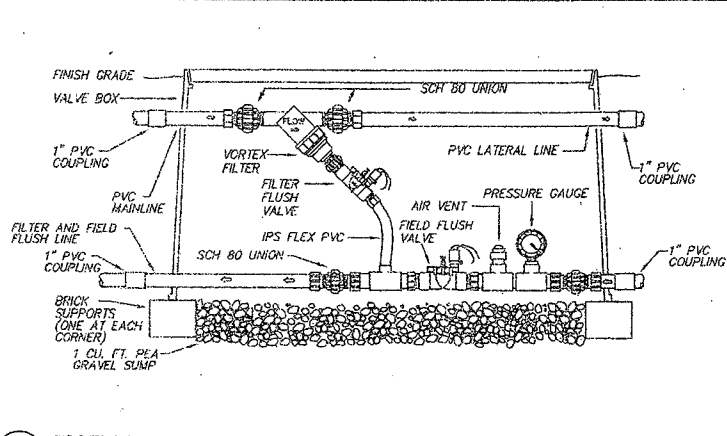
507LS SECTION  
**XERXES** CORPORATION  
 TITLE: 8" DIA. SINGLE-WALL CAP, 4,000 GALLONS  
 DATE: 5/02 DR. NO. S10-968



577  
**GEOFLOW** SIMPLE WASTEFLOW HEADWORKS BOX - DIMENSIONS  
 1" AND 3/4" MODELS  
 Not To Scale  
 08-02 | GEOFLOW



522  
**GEOFLOW** 1" AIR/VACUUM BREAKER (PLUMBED TO PVC)  
 Not To Scale  
 08-02 | GEOFLOW



504LS SECTION  
**GEOFLOW** MANIFOLD CONNECTION (PVC TO ADAPTER)  
 Not To Scale  
 08-02 | GEOFLOW

SEAL: [Signature]  
 DATE: 2/4/05

SCALE: N.T.S.	PROJECT NO.: 2004015
DRAWN BY: V.S.	DATE: 2/22/05
APPROVED BY: NAS	DATE: ---

NO.	REVISION:	DATE:
	PER ADH COMMENTS 3/29/05	
BY: VS		4/08/05
BY:		
BY:		
BY:		
BY:		

**PROJECT DESIGN CONSULTANTS**  
**PDC**  
 CIVIL ENGINEERS  
 130 N. MAIN STREET  
 CAVE SPRINGS, AR 72718  
 479-248-1361

STATE OF ARKANSAS  
 COUNTY OF WASHINGTON  
 CITY OF FAYETTEVILLE

DETAIL SHEET FOR SLOAN ESTATES

SHEET NUMBER: 6.3 OF 6.3



# FedEx

## Express

Part # 156297-435 RIT2 08/13

SHIP DATE: 22AUG13  
ACTWT: 1.2 LB  
CAD: /OFFC1420  
DIMS: 0x0x0 IN

BILL SENDER

ORIGIN ID: FYVA

UNITED STATES US

TO WATER DIV. PERMITS BRANCH  
ARKANSAS DEPT OF ENV QUALITY  
5301 NORTHSORE DR

REF: (989) 989-9898

DEPT: NORTH LITTLE ROCK AR 72118

FedEx Express

TRK# 8025 3693 3153

FRI - 23 AUG 3:00P  
STANDARD OVERNIGHT

72118  
AR-US  
LIT

X2 LITA

RT 177 1 A  
ST 2 3153 08.23

### FedEx NEW Package Express US Airbill

FedEx Tracking Number 8025 3693 3153

Form ID No. 0200

Recipient's Copy

1 From  
Date 8/22/13  
Sender's Name Kathy Bartlett  
Company Greenfield  
Address PO BOX 7299  
City Fayetteville State AR ZIP 72704

2 Your Internal Billing Reference

3 To  
Recipient's Name Water Div. Permits Branch  
Company Arkansas Dept of Env Quality  
Address 5301 Northshore Dr  
City N Little Rock State AR ZIP 72118

8025-3693 3153

#### 4 Express Package Service

Next Business Day

2 or 3 Business Days

FedEx First Overnight  
 FedEx Priority Overnight  
 FedEx Standard Overnight

FedEx 2Day A.M.  
 FedEx 2Day  
 FedEx Express Saver

#### 5 Packaging

FedEx Envelope\*  FedEx Pak\*  FedEx Box  FedEx Tube  Other

#### 6 Special Handling and Delivery Signature Options

SATURDAY Delivery  
 No Signature Required  
 Direct Signature  
 Indirect Signature

Does this shipment contain dangerous goods?  
 No  Yes

Cargo Aircraft Only

#### 7 Payment Bill to:

Sender  Recipient  Third Party  Credit Card  Cash/Check

Total Packages Total Weight

Align bottom of Peel and Stick Addressor Pouch here.

Align top of FedEx Express Shipping Label here.

Fold along dotted line to close.