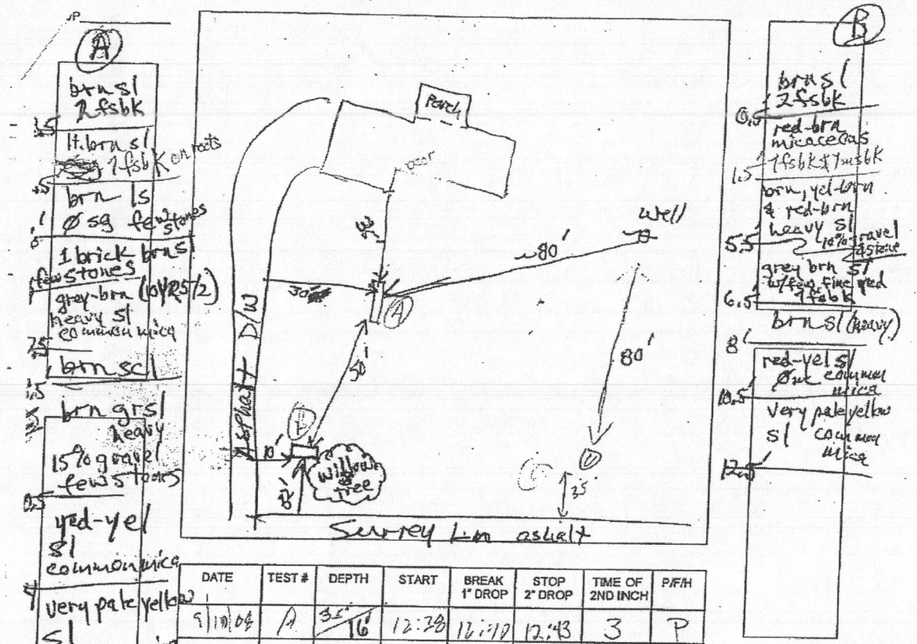
A/P



DATE	TEST #	DEPTH	START	BREAK 1" DROP	STOP 2" DROP	TIME OF 2ND INCH	P/F/H
5/10/06	A	3.5'/16'	12:38	12:42	12:43	3	P
	B	5'/12.5'	12:12	12:32	1:09		
"	C	7'/12.5'	11:47	No movement - Pulled			

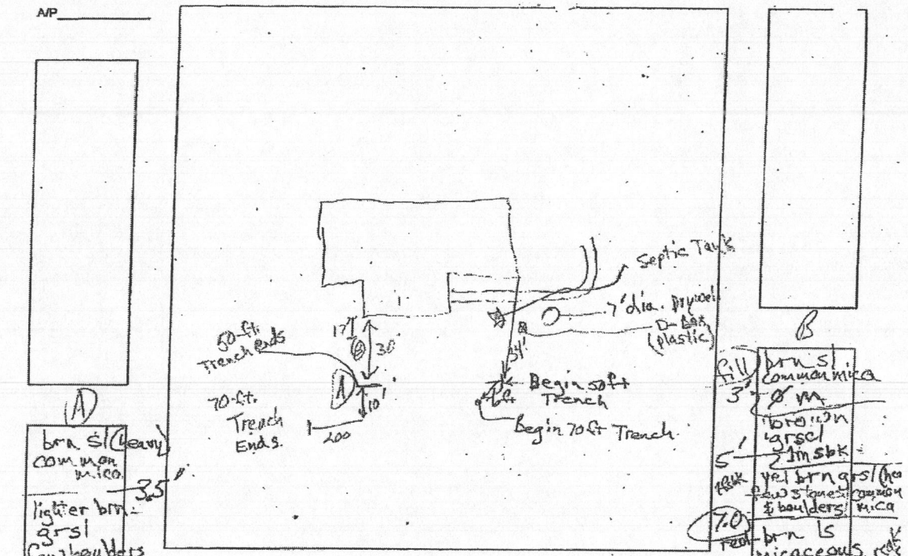
REMARKS _____

SANITARIAN RB / SD BACKHOE Carroll OTHERS Jose / Robin

TEST HOLES USED IN SDA _____ AVG. PERC TIME _____ SQ. FT/BR _____

TRENCH WIDTH _____ INLET DEPTH _____ MAX. BOT DEPTH _____ EFFECTIVE S/W _____

A/P



DATE	TEST #	DEPTH	START	BREAK 1" DROP	STOP 2" DROP	TIME OF 2ND INCH	P/F/H
8/17/06	C	6.5'/14'	1:45	2:05	Pulled		
	B	7.5'/14'	2:09	2:30	Pulled		
	B	8.3'/14'	2:46	2:58	Pulled		
	B	10'	Visual, <5 min. infiltration				

REMARKS No redox features in profile: Sidewall begins at ~7' at B.

SANITARIAN _____ BACKHOE Paul OTHERS Erika

TEST HOLES USED IN SDA _____ AVG. PERC TIME _____ SQ. FT/BR _____

TRENCH WIDTH _____ INLET DEPTH _____ MAX. BOT DEPTH _____ EFFECTIVE S/W _____

Tom W. Ashton R.E.H.S

P.O. Box 220 Bluemont VA 20135 540-454-4672

PROJECT NAME : Biggens
6726 Surrey Lane
Clarksville, MD 21029
Clarksville Ridge Lot 24

COUNTY : Howard County Maryland

DATE: May 22, 2009

TITLE : Health Department Evaluation

DESIGNED BY: Tom W. Ashton R.E.H.S

HOMEOWNER OPERATION and MAINTENANCE

The homeowner is the owner of the onsite system and is ultimately responsible for its proper use / operation and acceptable performance. It is recommended that the owner be familiar with this design package, and the components of the system. The owner is required to operate, monitor, and maintain the system as outlined below.

Remember, improper contact with sewage and electricity may be fatally hazardous.

All materials accompanying specific components such as the Treatment Unit, pump, and control panel are to be retained and kept with this package.

System Overview / Sequence of Operation

Household sewage enters the Advantex Treatment Unit by way of a standard gravity sewer line. The treatment system is sized to treat the maximum daily flow (600 gallons per day).

The dosing chamber contains a pump that is activated by floats within the pump chamber. The pump and floats have grade access by way of a riser. There are three floats, with the lowest float being the pump off float. When the effluent level rises to the second float, the pump will activate and evacuate the chamber, dosing the drainfield until the lower, "off" float terminates the cycle. A third, upper most float, located above the "on" float will sound in the event of pump, float switch, or control system failure. A minimum of 25 % of maximum daily emergency flow storage is provided above this float. If this alarm sounds call the installation contractor or a plumber.

In addition to the dose chamber floats and pumps, the pumping system includes a control panel, part of the Advantex control. The panel provides for manual operation of the pump, and testing of the alarm. An audiovisual high water alarm is encompassed in the panel.

A pressurized pump delivery line deposits the effluent to low pressure distribution system (LPD). The LPD system consists of pressure control valves followed by a supply manifold with the leach line distribution laterals branching to the graveled trenches. These dosing laterals are 1.25" in diameter with a specified size and number of holes. By design, when the pump activates the effluent is distributed equally throughout the length of all the trenches.

General Use Guidelines

The drainfield system is a biological treatment system that utilizes natural process to renovate and recycle wastewater into the environment. When properly used and maintained the system will give many years of service with little or no impact on the public health and environment.

Further, more efficient aerobic (with oxygen) treatment takes place within the drainfield at the soil interface and the unsaturated zone below.

As a biological treatment system, care should be taken with what is disposed into the system. Inorganic material such as feminine hygiene material, disposable diapers, plastics, synthetic rubber products, contraceptives, cigarettes, cat litter, and medications are not to be disposed into the system. Other materials that have a resistance to ready biologic treatment such as laundry lint, hair (cat feces), coffee grounds, and grease should be limited and should only enter the system incidentally.

Common household chemicals such as drain cleaner, disinfectants, and bleach should not effect the system when used in the quantities and frequencies recommended by the manufacturer. Under no circumstances are paints, solvents, pesticides / herbicides, petroleum products, and other similar materials to enter the system.

The system may become hydraulically overloaded and fail if abused through overuse, excessive peak use (laundry day), plumbing□Ø□□ fixture leakage, or surface water is allowed to enter the system. Footer drains, sump pump discharges, water treatment backwash, air conditioner condensation discharges, swimming pools, and other non sewage flows are not to be disposed into the system.

Surface, drive, and roof water should be directed away from the drainfield, and the finished grade should promote good surface drainage without ponding of water near the drainfield.

The drainfield area should receive only the most passive use. There should be no activity during wet periods. The area is not to be used for parking, material storage, intense recreation or any other activity that may cause compaction or erosion. Compaction will limit the oxygen exchange with the surface, compromising the treatment capacity of the drainlines, and may cause premature clogging of the soil.

The drainfield area should be maintained in an aggressive turf cover, cut to a moderate to long length. Do not plant maple, weeping willow, sycamore, cottonwood, locust, mimosa, or bamboo on or within 50' of drainfield. These and other known hydrophilic plants may enter and clog the systems . Do not mulch over system.

Required Operational Monitoring and Maintenance

Following are the minimum monitoring and maintenance procedures and frequencies. A log of activity should be maintained. Refer to manufacture's recommendations for additional information on specific components.

Note sewage and electricity may be fatally hazardous. Contact installation contractor, plumber, pumper, or electrician for specialized maintenance or repair.

Every 6 months
** Inspect pump chamber access risers interiors for signs of surface water infiltration.
** Visually inspect pump chamber for loose or tangled floats, solids etc.
** At pump control panel manually test the alarm and manual pump override.
** Inspect condition of valve box and distal end pipe housings.
** Walkover drainfield area and inspect for ponding and moist areas. I f noted, cause could be from hydraulic overload (plumbing leaks, overuse, infiltration), or broken or clogged pipe. System flushing frequency may be indicated.

Every Year
** Inspect the sludge level in the pump chamber. This may be performed with the use of a "sludge judge" or by a licensed septic tank pumper.

Lateral Flushing

The distal end of the distribution laterals have grade access for periodic testing and flushing. Additionally, grade access pressure adjustment valves are located at the lowest portion of the system. The frequency of lateral flushing will typically depend primarily upon the use of the system. Yearly flushing should be assumed.

Pump run times to evacuate the chamber vary with each design but are typically approximately five minutes. Shorter runs are acceptable, longer may indicate lateral orifice plugging, indicating a need for flushing. Contact the Health Department, septic tank pumper, contractor, or other service provider for acceptable flushing procedures.

Tom W. Ashton R.E.H.S
P.O. Box 220 Bluemont VA 20135 540-454-4672

PROJECT NAME : Biggens
6726 Surrey Lane
Clarksville, MD 21029
Clarksville Ridge Lot 24
COUNTY : Howard County
Maryland

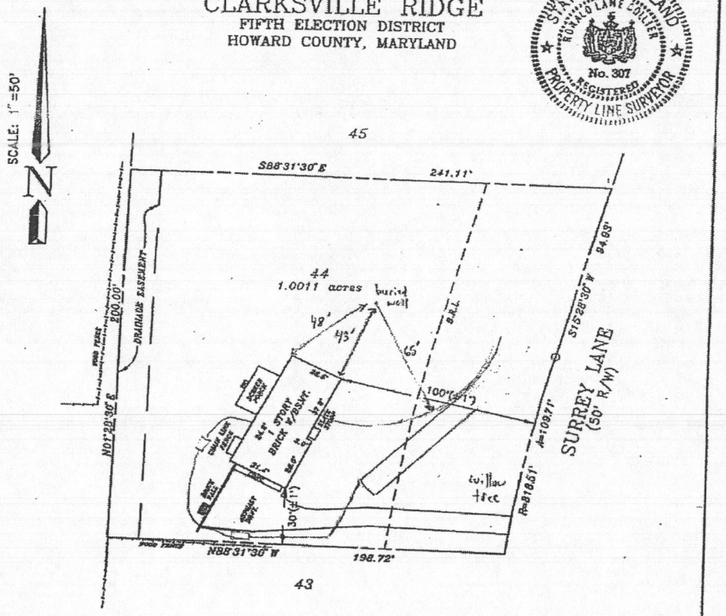
DATE: May 22, 2009

TITLE :
General Operation

DESIGNED BY: Tom W. Ashton R.E.H.S

LOCATION DRAWING
6726 SURREY LANE
LOT 44
CLARKSVILLE RIDGE
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

STATE OF MARYLAND
RONALD LANE COLLIER
No. 307
REGISTERED
PROPERTY LINE SURVEYOR



"THE SUBJECT DWELLING DOES NOT LIE WITHIN A FLOOD HAZARD ZONE AS SHOWN ON HUD FLOOD INSURANCE STUDIES"

HOUSE LOCATION SURVEY: 5/19/95

SURVEYORS CERTIFICATE

I hereby certify that the position of the existing improvements shown hereon have been carefully established by accepted land surveying practices and that, unless shown, there are no visible encroachments either way across the property lines. The plan is of benefit to a consumer only insofar as it is required by a lender or a title insurance company or its agent in connection with contemplated transfer, financing or refinancing. The plan is not to be relied upon for the establishment or location of fences, garages, buildings, or other existing or future improvements. The plan does not provide for the accurate identification of property boundary lines, but such identification may not be required for the benefit of title or securing financing or refinancing. This drawing was prepared solely for the benefit of a title report.

5-19-95

RONALD L. COLLIER
REG. PROPERTY LINE SURVEYOR
MD. NO. 307

Charles P. Johnson & Associates, Inc.
PLANNERS • ENGINEERS • LANDSCAPE ARCHITECTS • SURVEYORS
1751 ELTON ROAD SILVER SPRING, MARYLAND 20903
(301)434-7000 Fax(301)434-7610 FREDERICK, MD - FAIRFAX, VA

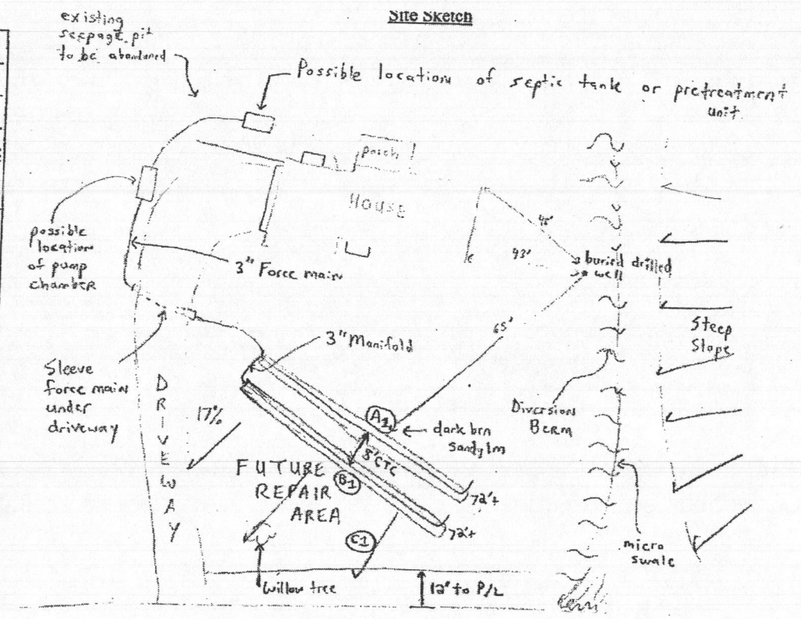
REFERENCE	Drawn by BLT	Checked by RLC
Plat Book 7	Date 5/23/95	Record No.
Plat No. 29	Scale 1"=50'	23-078-91.03

TEST DATA

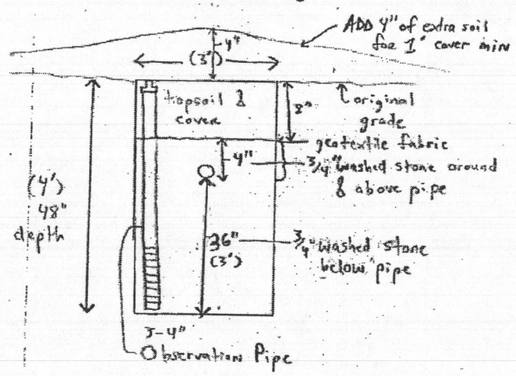
NAME Robin Biggins — FILE NO
LOCATION Clarksville Ridge Lot 44 — COUNTY Howard
6726 Surrey Lane — DATE 10/15/08
Clarksville, MD 21029 — GRID E
RECORDED BY Steven R. Krieg / Stuart Oster — N

HOLE NO.	TEST NO.	DEPTH	CLOCK TIME	ELAPSED TIME	MEASUREMENT	REMARKS (Method, Moisture, Biopores)
A1	A1	6" below grade	12:16	—		STD. PERC HOLE 1'X1' w/ PERC STICK
			12:18	2min	5"	
			12:22	4min	4"	
						4mpi
B1	B1	1' below grade	12:38	—		STD. PERC HOLE 1'X1' w/ PERC STICK
			12:48	10min	5"	
			1:03	15min	4"	
						15mpi
C1	C1	18" below grade	1:45	—	18"	
			1:50	5min	17 1/16"	6.6mpi
			1:55	5min	16 1/16"	8.8mpi
			2:00	5min	16 1/16"	16mpi
			2:05	5min	16"	13mpi
						Open hole Test w/ hook guage
						15mpi ±

Site Sketch



TRENCH PROFILE



Tom W. Ashton R.E.H.S
P.O. Box 220 Bluemont VA 20135 540-454-4672

PROJECT NAME : Biggens
6726 Surrey Lane
Clarksville, MD 21029
Clarksville Ridge Lot 24
COUNTY : Howard County Maryland

DATE: May 22, 2009

TITLE :
MDE Evaluation

DESIGNED BY: Tom W. Ashton R.E.H.S

MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard • Baltimore MD 21230
410-537-3000 • 1-800-633-6101

Martin O'Malley
Governor

Anthony G. Brown
Lieutenant Governor

Shari T. Wilson
Secretary

Robert M. Summers, Ph.D.
Deputy Secretary

Mr. Bert Nixon, Director
Howard County Health Department
Bureau of Environmental Health
7178 Columbia Gateway Drive
Columbia, Maryland 21046

December 10, 2008

RE: **Biggins Property**
Clarksville Ridge, Lot 44
6726 Surrey Lane
Clarksville, MD 21029

Dear Mr. Nixon:

I have reviewed your site evaluation data from your file and further evaluated the site with Stuart Oster of your office on October 15, 2008. The results of our site evaluation indicate the site is suitable for an advanced pretreatment unit followed by the installation of an LPD (low pressure dosing) system. LPD systems have several advantages in that they improve distribution through pressurized laterals that disperse the effluent uniformly throughout the entire drainfield area in conjunction with periodic dosing and resting cycles, which enhance and encourage aerobic conditions in the soil. Since the proposed system location will require a variance to reduce the setback to the existing buried well, the installation of an LPD system versus pumping to a standard gravity distribution box system is recommended.

The property owner may wish to contact a qualified soils and onsite system design consultant if they feel that other options for this property should be explored or proposed. The following sections summarize requirements necessary for proceeding with the project.

Pretreatment

Employing advanced pretreatment on septic tank effluent is beneficial from the standpoint of enhancing the soil absorption component of the system's performance and extending its life. There are a variety of devices and methods for providing advanced pretreatment, including constructed wetlands, aerobic pretreatment units, fabric biofilters, single pass and recirculating sand filters, peat filters, composting toilets, and greywater re-use systems.

Advanced pretreatment units that can reduce nitrogen compounds are preferred and may be eligible for grant funding through MDE's Bay Restoration Fund. The property owner's consultant may have preferences for a pretreatment unit to complement the soil absorption system selected. A good comparison of some pretreatment units can be found at the EPA's New England's Center for Environmental Industry and Technology (CEIT) web site at:
http://www.epa.gov/region1/assistance/ceitts/wastewater/techs.html.

Pretreatment units eligible for grants from MDE's Bay Restoration Fund are listed at:
http://www.mde.state.md.us/Water/CBWRF/osds/brf_bat.asp

Soil Absorption Component

The soil loading rates are based on the soil morphology observed in the test pits, and percolation testing (see attachments). The loading rates indicated are in conformance with MDE's alternative systems policy and the Tyler chart included with this letter. If utilizing pretreated effluent with low pressure trenches (LPD), a 0.7 gpd/sq.ft. loading rate is recommended.

The initial system for a four bedroom house would require 143 linear ft (2-72 ft trenches if equal length) of shallow pressure dosed trenches assuming the soil evaluations indicate a design where trenches are 3 feet wide, 4 feet deep with 3 feet of effective sidewall. This will provide 857 sq. ft. of absorption area and will satisfy the recommended loading rate of 0.7 gpd/sq.ft. for a four bedroom max design flow of 600 gpd. Alternatively, a more conservative design assuming only 2 ft of effective sidewall would require 180 linear feet (3-60 ft trenches if equal length). The designer should chose the option that works best for the site, taking into consideration contour, trench spacing and room for future repair.

Septic Tank(s) and Pump Chamber

A top seam two-compartment septic tank with a total capacity of 1500 gallons should be provided. The volume of the first chamber should be 1000 gallons. Access for an effluent filter should be provided at the outlet of the second chamber. Since advanced pretreatment is required, the septic tank size may vary depending on the design of the pretreatment unit selected and may comprise only one tank of a smaller size prior to the pretreatment unit/chamber/tank. The pretreatment unit itself may incorporate the tankage required for the settling of solids usually provided by the septic tank.

A top seam pump chamber should be included that is a minimum volume of 1,000 gallons. This may allow for dosing of the effluent as well as one day's storage above a high water alarm which is required.

As always, an inspection should be conducted to evaluate all tanks for water tightness.

Plans and Specifications

It is recommended that a qualified on-site systems design consultant be retained by the property owner to provide final plans and specifications for the system. Enclosed are MDE minimum requirements for the submission of acceptable plans. Alternative system design review can be handled by the county, but I will be available to assist with this review. Initially, one set of plans must be submitted to your office and one set to MDE's Onsite System's Division.

Agreement and Easement

An Agreement and Easement needs to be signed by all parties, recorded in the land records and returned to the local Approving Authority and MDE before permits to construct can be issued. The Agreement and Easement establishes the regulatory conditions associated with the project. A combined BRF and Alternative Agreement is available and preferred if a BRF grant funded system is employed. Contact the BRF program for additional information.

Location of Utility Lines

The location of any utilities leading from the street to the house must be located to determine the feasibility of using the front yard for a sewage disposal system.

Upslope Drainage Diversion

Construction of a small diversion swale and berm along the right side of the property as seen when facing the house from the road, should be performed to intercept and collect surface runoff from the upslope drainage areas and divert water away from the LPD dispersal system. Diversion of roof rain drainage, and surface water from upslope areas around the back of the house should also be considered for the installation of the septic tanks or pretreatment units.

Variance

The property is currently served by a drilled well buried below grade and although up gradient of the proposed system, it will be located less than 100 feet to the proposed system location (Approximately 65 ft). A variance is required to reduce the setback distance. Please have the property owner send a request in writing to your office. Code of Maryland Regulations (COMAR 26.04.02) contains a reasonable provision for such variances to be granted by the MDE upon the recommendation of the Approving Authority.

Howard Co. Health Dept
Env. Health - Mike Davis

Linked Deposit

Additional financial assistance may be available for this project through the Department of the Environment's Linked Deposit Program. Information concerning this loan program:
http://www.mde.state.md.us/Programs/WaterPrograms/Water_Quality_Finance/Link_Deposit/index.asp

Bay Restoration Fund

Information on the Bay Restoration Fund (BRF) which may provide a grant to cover the cost of a nitrogen reducing aerobic pretreatment unit, is available on MDE's website.
http://www.mde.state.md.us/Water/CBWRF/osds/index.asp The BRF project manager for your county may provide additional information. The BRF Hotline is (410) 537-4195.

A copy of the site evaluation data is enclosed. Please forward a copy of this letter and the attachments to the property owner. If you have questions regarding this matter please call me at (410) 537-3680 or email at skrieg@mde.state.md.us.

Sincerely,

Steven R. Krieg, R.S

Steven R. Krieg, R.S.
Regional Consultant, On-Site Systems Division

Attachments

cc: Barry Glotfelty
John Boris

Tom W. Ashton R.E.H.S
P.O. Box 220 Bluemont VA 20135 540-454-4672

PROJECT NAME : Biggens
6726 Surrey Lane
Clarksville, MD 21029
Clarksville Ridge Lot 24

COUNTY : Howard County
Maryland

DATE: May 22, 2009

TITLE :
MDE Letter

DESIGNED BY: Tom W. Ashton R.E.H.S

LOCATION DRAWING

6726 SURREY LANE

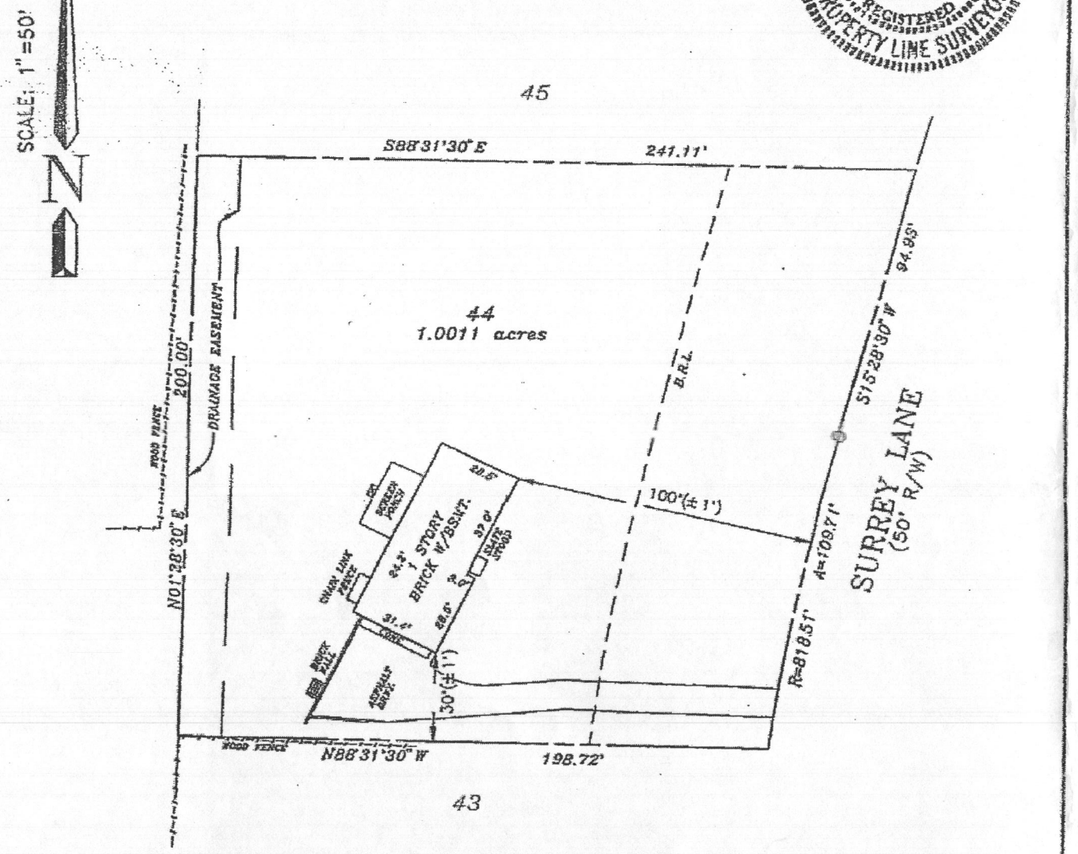
LOT 44

CLARKSVILLE RIDGE

FIFTH ELECTION DISTRICT

HOWARD COUNTY, MARYLAND

STATE OF MARYLAND
RONALD LANE COLLER
No. 307
REGISTERED
PROPERTY LINE SURVEYOR



"THE SUBJECT DWELLING DOES NOT LIE WITHIN A FLOOD HAZARD ZONE AS SHOWN ON HUD FLOOD INSURANCE STUDIES"

HOUSE LOCATION SURVEY: 5/19/95

SURVEYORS CERTIFICATE

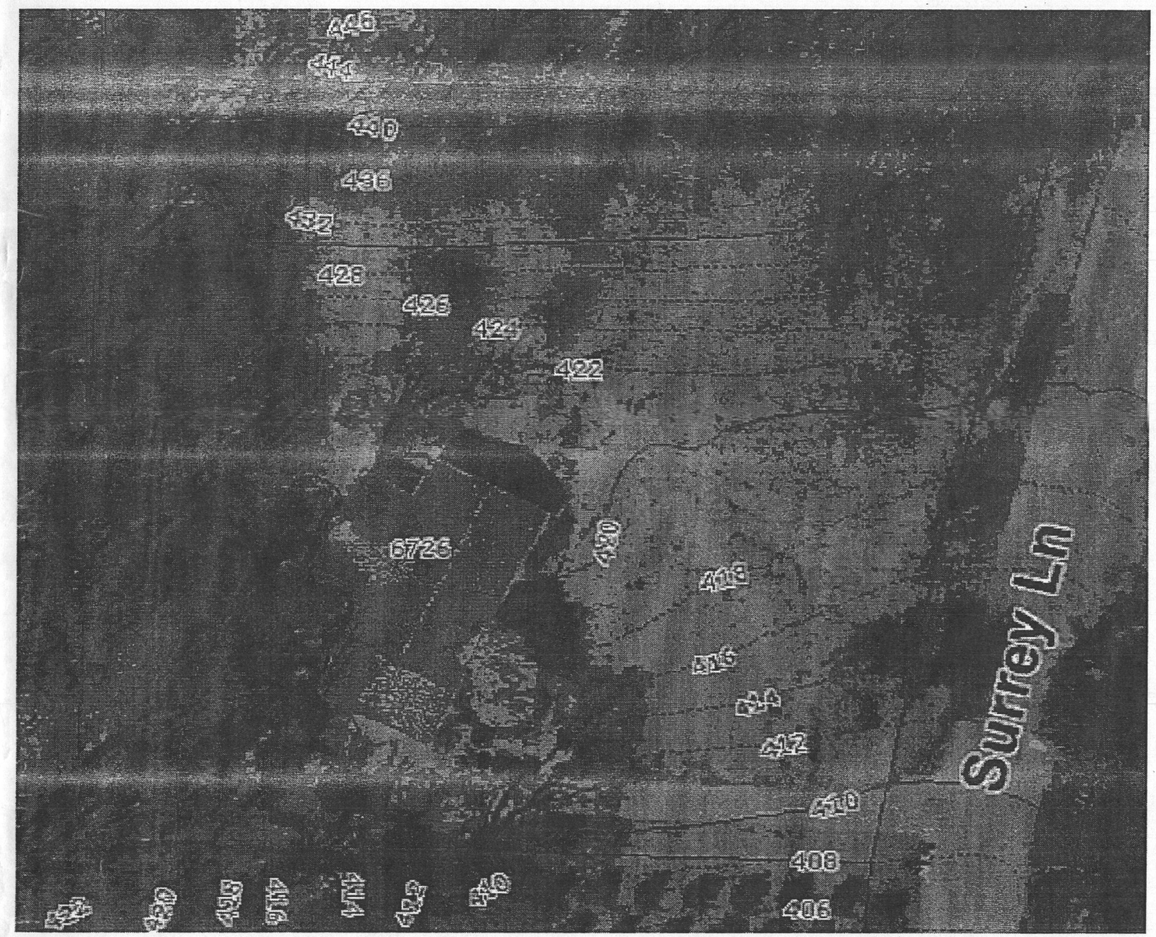
I hereby certify that the position of the existing improvements shown hereon have been carefully established by accepted land surveying practices and that, unless shown, there are no visible encroachments either way across the property lines. The plan is of benefit to a consumer only insofar as it is required by a lender or a title insurance company or its agent in connection with contemplated transfer, financing or refinancing. The plan is not to be relied upon for the establishment or location of fences, garages, buildings, or other existing or future improvements. The plan does not provide for the accurate identification of property boundary lines, but such identification may not be required for the transfer of title or securing financing or refinancing. This drawing was prepared w/o the benefit of a title report.

5-19-95

RONALD L. COLLER
REG. PROPERTY LINE SURVEYOR
MD. NO. 307

Charles P. Johnson & Associates, Inc.
PLANNERS • ENGINEERS • LANDSCAPE ARCHITECTS • SURVEYORS
1751 ELTON ROAD SILVER SPRING, MARYLAND 20903
(301)434-7000 Fax(301)434-7010 FREDERICK, MD - FAIRFAX, VA

REFERENCE	Drawn by BLT		Checked by RLC	
Plat Book 7	Date 5/23/95		Record No.	
Plat No. 29	Scale 1"=50'		23-078-91.03	



Tom W. Ashton R.E.H.S

P.O. Box 220 Bluemont VA 20135 540-454-4672

PROJECT NAME : Biggens
6726 Surrey Lane
Clarksville, MD 21029
Clarksville Ridge Lot 24

COUNTY : Howard County
Maryland

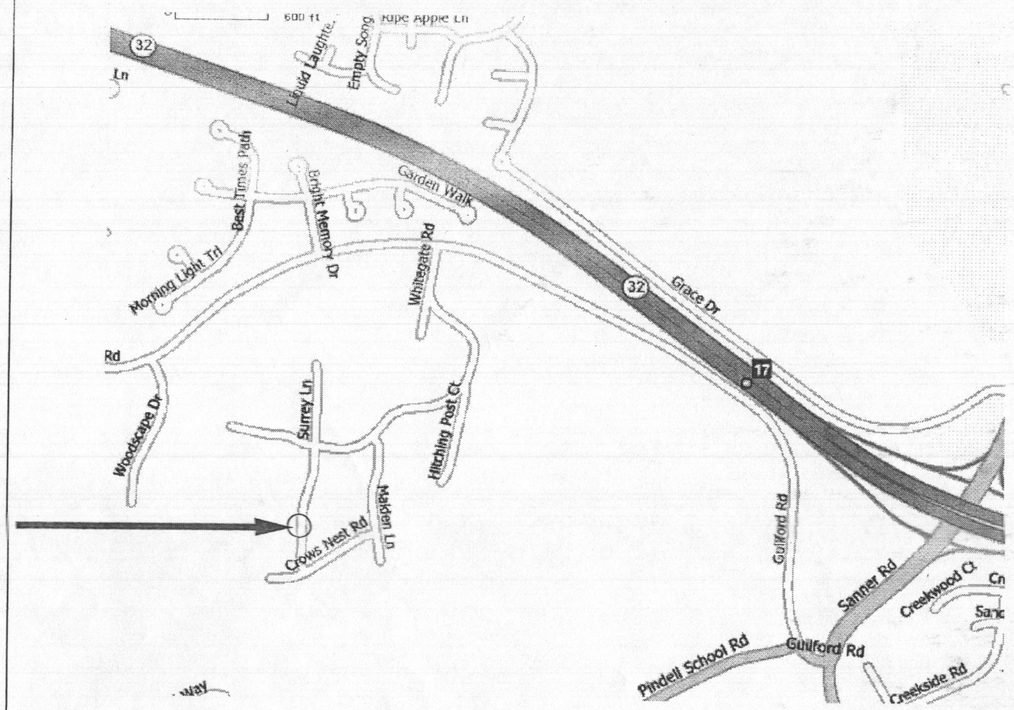
DATE: May 22, 2009

TITLE :
House Location TOPO

DESIGNED BY: Tom W. Ashton R.E.H.S

SHEET: 15 of 16

LOCATION MAP



NOTE: ***The preservation of the original structure of the soil in the absorption area is essential to maintaining the percolative capacity of the soil. No activity other than the construction of the system is permitted within the absorption area.***

The absorption system is not to be constructed during periods of wet weather when the soil is sufficiently wet at the depth of installation to exceed its plastic limit. The plastic limit is exceeded when the soil can be rolled between the palms of the hands to produce threads 1/8 inch in diameter without breaking and crumbling.

Vegetation should be removed by hand and not by machine. All stumps are to be left intact and cut flush with the ground. Stumps are to be removed only when encountered during installation. Removal to be with a minimum of soil disturbance. Stumps should be cut out such that as much as the root system as possible is left intact.

NOTES TO CONTRACTOR:

General: This On Site Sewage Treatment and Dispersal system is to be installed according to the following specifications referencing the enclosed attachments. These plans are to be accompanied by a current valid Health Department permit prior to construction. The exact location of all utilities must be determined prior to construction and any required setbacks adhered. The contractor is responsible to be familiar with the system design and install the system in accordance with Department of Health, local County ordinances, local standard practices, and is to be properly licensed and certified as may be required by the appropriate state and local agencies.

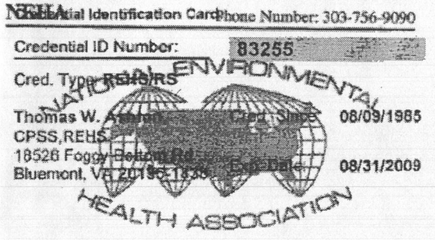
Pre construction meeting: Experienced on site sewage disposal system installation contractors should not require a pre construction meeting unless an individual design specifically requires it. Please call with any questions or to request a pre-construction meeting.
The contractor is responsible to perform a pre construction recognizance and / or stakeout prior to construction to verify the design and to plan the construction process. Get in touch if there are any questions.

Specification: All manufacturers requirements must be adhered to and materials accompanying specific components such as the outlet filter, pump, and control panel are to be retained and kept with this package for future owner reference.

SCOPE: HOUSEHOLD SEWAGE WILL FLOW BY GRAVITY an Advantex TREATMENT UNIT
bio– FILTER WHERE IT IS THEN RETURNED TO THE Low Pressure Distribution DOSE TANK
This chamber WILL DISPOSE OF THE EFFLUENT
BY demand DOSING to the SOIL ABSORBTION AREA.

CONTENTS:

Approved Septic System Plan
Howard County Health Department
Pretreatment & L.P.D.
repair approved as shown Sheets 1 to 16
9/1/2009
Date
Signature



Tom W. Ashton R.E.H.S
P.O. Box 220 Bluemont VA 20135 540–454–4672

PROJECT NAME : Biggens
6726 Surrey Lane
Clarksville, MD 21029
Clarksville Ridge Lot 24

COUNTY : Howard County
Maryland

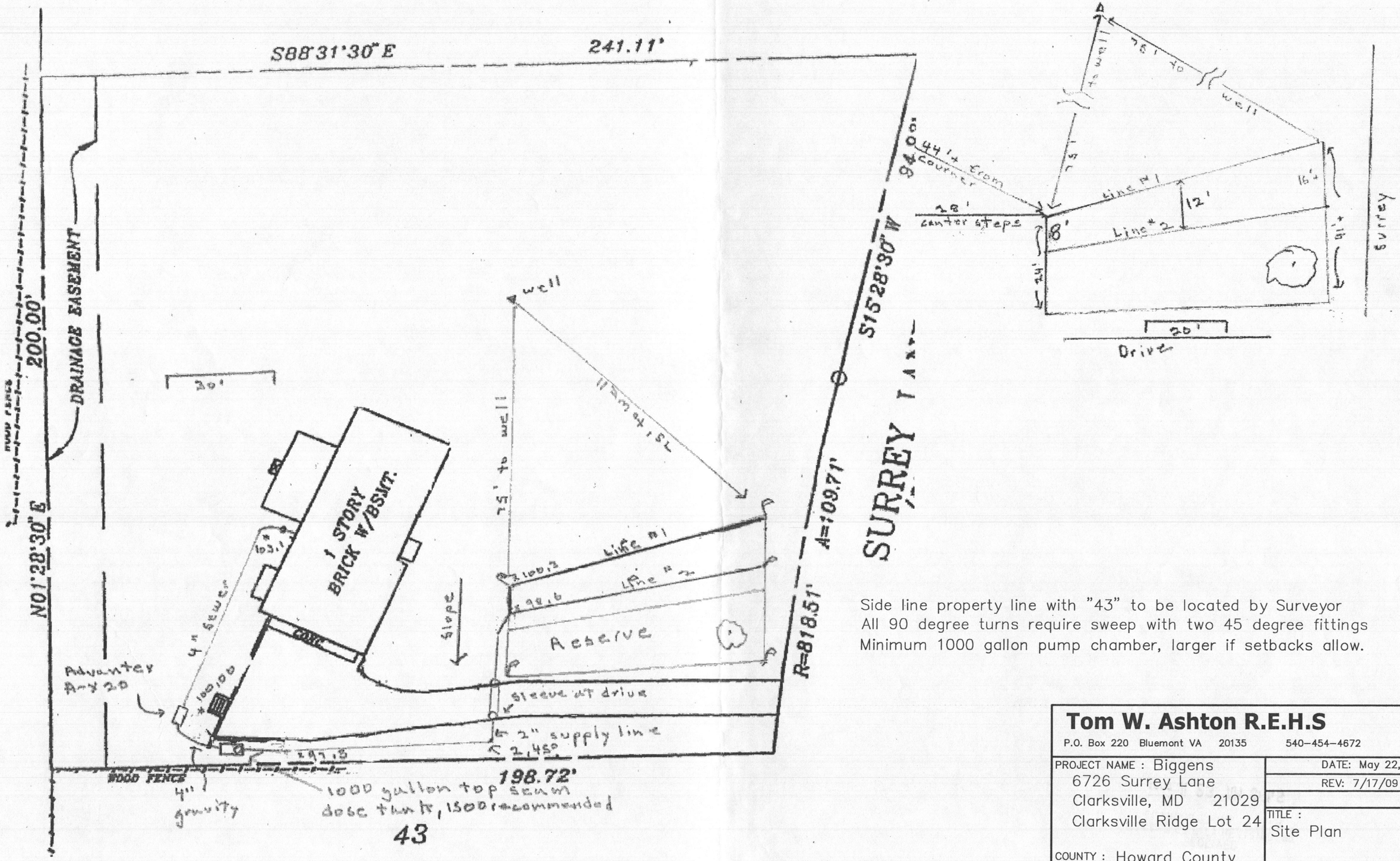
DATE: May 22, 2009
REV: 7/17/09

TITLE :
COVER SHEET
PERC–RITE® DRIP
DESIGN

DESIGNED BY: Tom W. Ashton R.E.H.S

NTS

SHEET: 1 OF 16



Side line property line with "43" to be located by Surveyor
All 90 degree turns require sweep with two 45 degree fittings
Minimum 1000 gallon pump chamber, larger if setbacks allow.

Tom W. Ashton R.E.H.S
P.O. Box 220 Bluemont VA 20135 540-454-4672

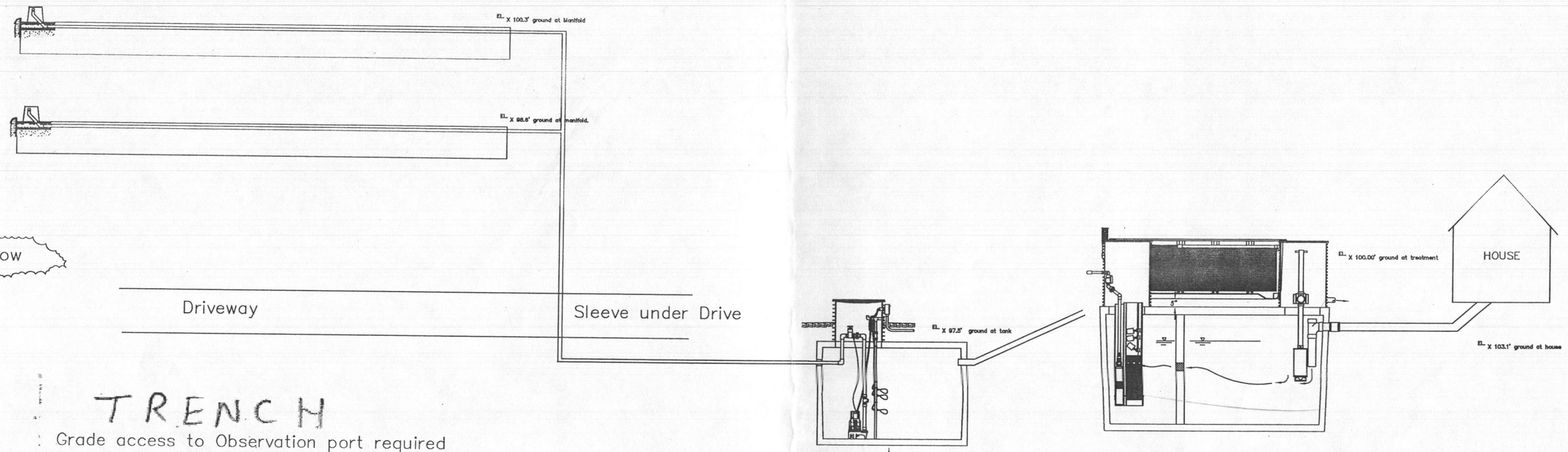
PROJECT NAME : Biggens
6726 Surrey Lane
Clarksville, MD 21029
Clarksville Ridge Lot 24

COUNTY : Howard County

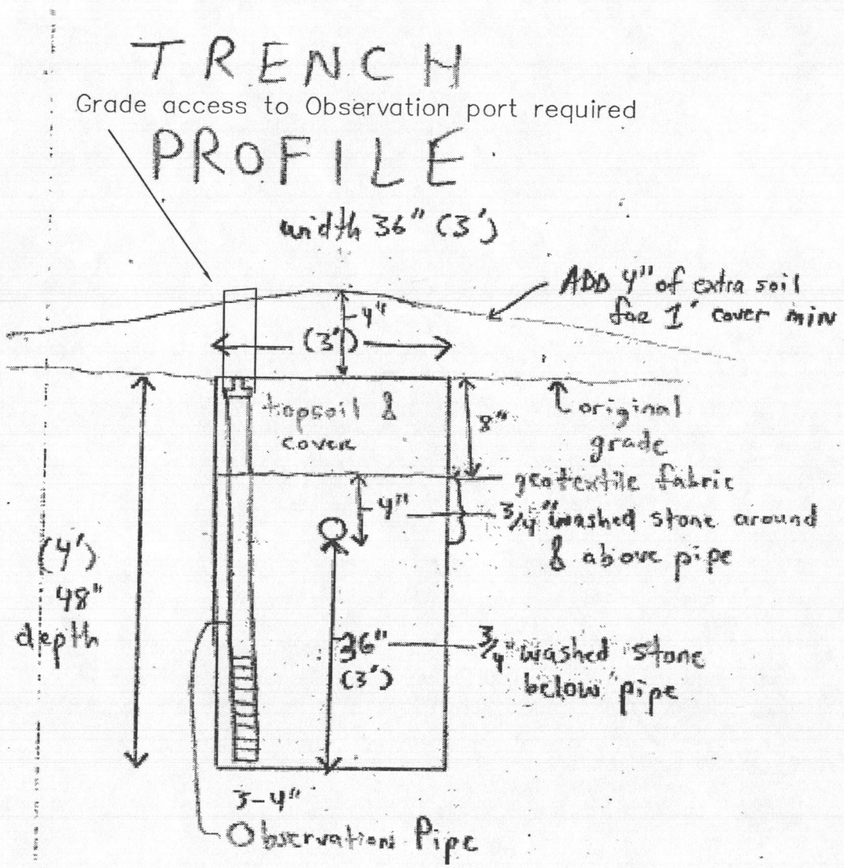
DATE: May 22, 2009
REV: 7/17/09

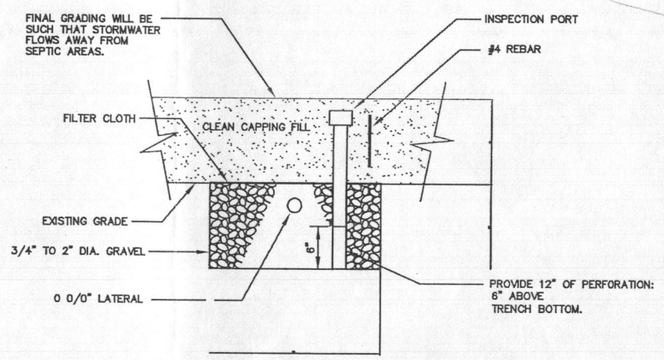
TITLE : Site Plan

DESIGNED BY: Tom W. Ashton R.E.H.S



Minimum 1000 gallon pump chamber, larger if setbacks allow.





TRENCH SECTION

N.T.S.

NOTE: DEPTH TO BOTTOM OF GRAVEL FROM FINISHED GRADE MAY VARY SLIGHTLY.

DESIGNED BY: Tom W. Ashton R.E.H.S

Tom W. Ashton R.E.H.S
P.O. Box 220 Bluemont VA 20135 540-454-4672

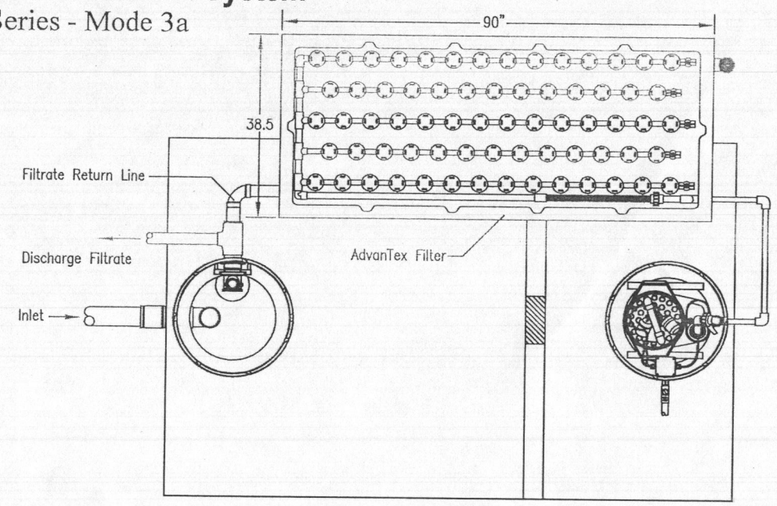
PROJECT NAME : Biggens
6726 Surrey Lane
Clarksville, MD 21029
Clarksville Ridge Lot 24
COUNTY : Howard County Maryland

DATE: May 22, 2009
REV: 7/17/09

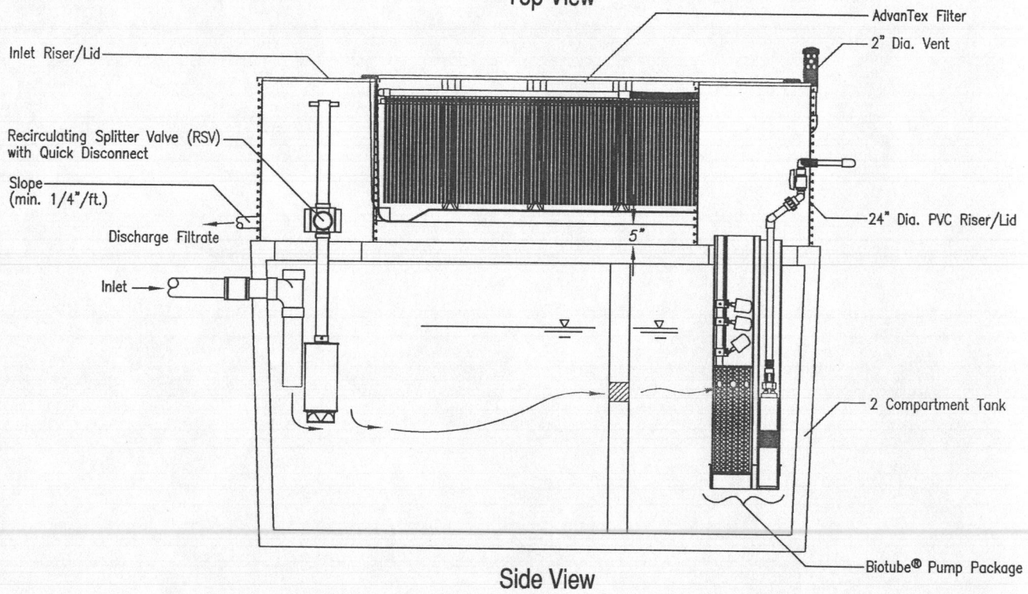
TITLE :
HYDRAULIC PROFILE

AdvanTex™ Treatment System

AX 20 Series - Mode 3a

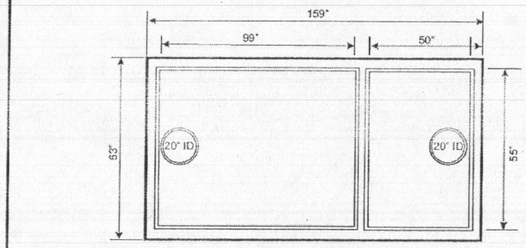


Top View

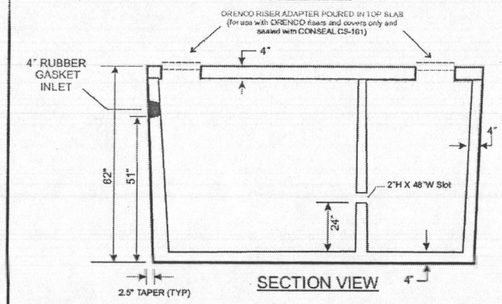


Side View

1500 GALLON 2-C TANK
for Advantex® Treatment System



TOP VIEW



SECTION VIEW

BAYSTAR PRECAST CORPORATION — Since 1989

925 Skinners Turn Road
P.O. Box 959
Owings, Maryland 20736-0959

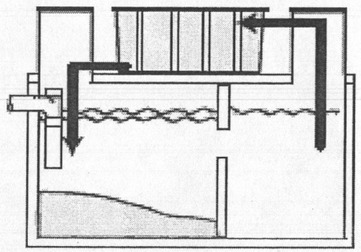
800.451.5583
410.257.5777
301.855.5777
fax 410.257.1312

Date Appr. 081208 | 1500 2C ADX_STA rev 052009 | Drawing not to scale

1500 GALLON 2-COMPARTMENT TANK
for Advantex® Treatment System

GENERAL NOTES: CONCRETE STRENGTH 4000 PSI AT 28 DAYS

REINFORCING DETAILS: 6X6 #10 GAUGE WIRE MESH INSIDE BOTTOM
TOP HAS #3 BAR 12" O/C SIDES AND BOTTOM HAS #3 BAR 12"O/C



Mode 3 with processing tank
(Optimized for denitrification)

Tom W. Ashton R.E.H.S
P.O. Box 220 Bluemont VA 20135 540-454-4672

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6726 Surrey Lane
Clarksville, MD 21029
Clarksville Ridge Lot 24

COUNTY : Howard County
Maryland

DATE: May 22, 2009

REV: 7/17/09

TITLE :
Advantex Treatment

DESIGNED BY: Tom W. Ashton R.E.H.S

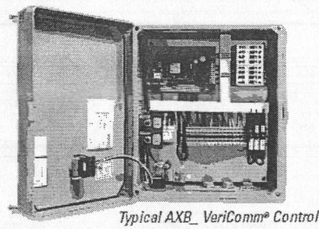
VeriComm® AXB_ Control Panels

Technical Data Sheet

For AdvanTex® Treatment Systems

Applications

VeriComm® AXB1 and AXB2 remote telemetry control panels are used with two-pump operations — recirculation and discharge (on-demand or timed) — for AdvanTex® Treatment Systems. Interlocked controls prevent the recirculation pump from running if there is a high level alarm on the discharge side. Coupled with the VeriComm Web-based Monitoring System, these affordable control panels give water/wastewater system operators and maintenance organizations the ability to monitor and control each individual system's operation remotely, with real-time efficiency, while remaining invisible to the homeowner. VeriComm AXB panels allow remote operators to change system parameters, including timer settings, from the Web interface.



Typical AXB_ VeriComm® Control Panel
Standard Models: VCOM AXB1, VCOM AXB2

To Specify...

To specify this panel for your installation, require the following:

Basic Control Logic: Three Operating Modes

- A "Start-up Mode" for the initial 30 days, during which the system collects trend data to establish operating standards for future reference.
- A "Normal Mode" that manages day-to-day functions.
- A "Test Mode" that suspends data collection and alarm reporting during installation and service.

Data Collection and Utilization

- Data logs of system conditions and events, such as pump run times, pump cycles, and alarm conditions.

Troubleshooting and Diagnostic Logic

- Troubleshooting capabilities that can report suspected failed components, which then trigger Alarms.

Advanced Control Logic

- Advanced control logic that activates during float malfunctions to diagnose the situation and keep the system operating normally until servicing.

Communication and Alarm Management

- Remote telemetry capabilities coupled with a Web-based monitoring application (see *VeriComm Monitoring System*, ATD-WEB-VCOM-1) for communication and alarm management. Updating of point values (including timer settings) and receipt of queued changes during each communication session with host. Communication sessions that occur monthly, at a minimum, and more frequently during alarm conditions.
- Multiple methods of communication, as follows:

  Call-In to VeriComm® Host
  - Automatic notification to host of "Alarms," which signal fault conditions that need to be addressed immediately (e.g., pump failure).
  - Automatic notification to host of "Alerts," which signal less critical fault conditions and which trigger the panel's troubleshooting logic and alternative operating mode (e.g., stuck float switch).
  - Automatic notification to host of "Updates," which include alarm updates or all-clear notifications following Alarms/Alerts, as well as normally scheduled monthly panel reports.
  - Manual, forced communication from panel to host to effect an updating of point values and receipt of queued changes.

  Real-Time Direct Connection to Panel
  - Manual, direct connection at the site via RS-232 serial port, to allow a local operator real-time access to detailed logged data and the ability to change point values from a laptop.
  - Manual, forced communication by local operator/homeowner at the site to initiate an auto-answer mode, allowing a remote operator real-time access to detailed logged data and the ability to change point values.

During real-time, manual connections, software with open architecture (and password security) is used; no proprietary software is required. VT100 protocol allows access and control from any computer modem (Mac or PC) with a simple communication program (e.g., Windows® HyperTerminal); multilevel password protection in panel ensures that only qualified personnel can access the panel's data.

Additional Features

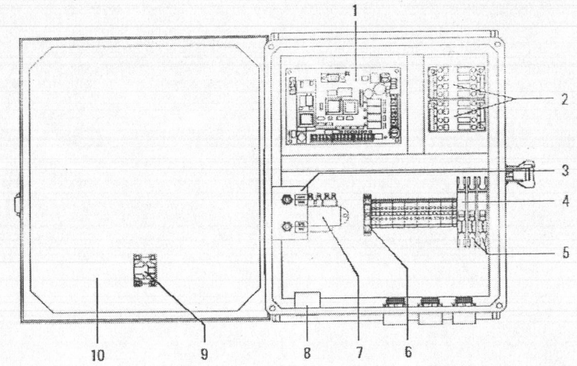
- Status light indicators on the board, including . . .
  - Flashing green LED for normal operation
  - Yellow LEDs for status of digital inputs
  - Red LEDs for status of digital outputs and modem activity
- UL-recognized and FCC-approved

For more information, try our online demo at www.vericomm.net (no password required).

Orenco Systems® Incorporated

Changing the Way the World Does Wastewater®

800-348-9843
www.orenco.com



1. VeriComm® Remote Telemetry Board
2. Motor-Start Contactors
3. Toggle Switches
4. Control Circuit Breaker
5. Pump Circuit Breakers
6. Fuse
7. Transformer
8. Audio Alarm
9. Visual Alarm
10. Panel Enclosure

Standard Components

Feature	Specifications
1. VeriComm® Remote Telemetry Unit*	ATRTU-100: 36/18 VAC (center tap transformer), 8 digital inputs, 4 analog inputs, 4 digital outputs, 0 analog outputs, on-board modem (2400 baud), LED input and output indicators, 1-year battery backup of data and program settings.
2. Motor-Start Contactors	120 VAC: 16 FLA, 1 hp, 60 Hz; 2.5 million cycles at FLA (10 million at 50% of FLA). 240 VAC: 16 FLA, 3 hp, 60 Hz; 2.5 million cycles at FLA (10 million at 50% of FLA).
3. Toggle Switches	Single-pole switch, automatic On, with spring-loaded, momentary, manual On. 20 A, 1 hp.
4. Control Circuit Breaker	10 A, OFF/ON switch. Single-pole 120 VAC, double-pole 240 VAC. DIN rail mounting with thermal magnetic tripping characteristics.
5. Pump Circuit Breakers	20 A, OFF/ON switch. Single-pole 120 VAC, double-pole 240 VAC. DIN rail mounting with thermal magnetic tripping characteristics.
6. Fuse	120 VAC Primary, 36 VCT @ 0.85 A Secondary.
7. Transformer	250 VAC, 1 A.
8. Audio Alarm	95 dB at 24 in. (610 mm), warble-tone sound.
9. Visual Alarm	7/8 in. (22 mm) diameter red lens, "Push-to-silence." NEMA 4, 1 W bulb, 120 VAC.
10. Panel Enclosure	Measures 15.5 in. high x 13.3 in. wide x 6.7 in. deep (384 mm x 338 mm x 170 mm). NEMA 4X rated. Constructed of UV-resistant fiberglass; hinges and latch are stainless steel. Conduit couplings provided.
VCOM-AXB1	120 VAC, 3/4 hp, 14 A, single-phase, 60 Hz.
VCOM-AXB2	240 VAC, 2 hp, 14 A, single-phase, 60 Hz.

Optional Components

Feature	Specifications	Product Code Adder
Pump Run Light	7/8 in. (22 mm) diameter green lens. NEMA 4, 1 W bulb, 120 VAC.	PRL
Anticondensation Heater	Self-adjusting: radiates additional wattage as temperature drops.	HT
Programmable Timer	Discharge side timed dosing.	PT
UV Disinfection Compatibility	UV grounded power circuit and alarm contacts. Pump disable upon UV failure.	UV

** See VeriComm® Remote Telemetry Unit (ATD-CP-VCOM-1) and VeriComm® Monitoring System (ATD-WEB-VCOM-1) for more detail.*

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PROJECT NAME : Biggens
6726 Surrey Lane
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Clarksville Ridge Lot 24
COUNTY : Howard County
Maryland

DATE: May 22, 2009
REV: 7/17/09

TITLE :
Vericom Panel

DESIGNED BY: Tom W. Ashton R.E.H.S

SHEET: 5 OF 16

SPECIFICATIONS

ITEM 1: Building Sewer

Materials

The building sewer is to be constructed with 4" Schedule 40 PVC pipe. is to be greater than 1.25" in 10'. The minimum depth is 18". To be constructed in accordance with manufactures specifications regarding preparation (sanding and primer) and gluing (chemical fusion) requirements.

Joining of pipes of different sizes and or material shall be accomplished by the use of a manufactured adapter specifically designed for that purpose. Maintain the run as straight as possible. Ells (if absolutely necessary) are not to exceed 45 degrees.

Cleanouts

A cleanout is to be installed a minimum of 5' from the structure with additional cleanouts every 50' as necessary. The cleanouts are to be installed in the direction of the sewage flow.

Bedding and support

The entire length of the sewer line (as well as the conveyance and forced main) is to be bedded uniformly on natural, in place soil or on gravel packed over in place soil to provide uniform support along the length. Where the line crosses filled areas, the line is to be supported by an angle iron, or other suitable method, firmly place on solid, natural ground for 2 feet at either end.

Where the sewer line crosses the angular open space around the septic tank hole, the space is to be bridged by use of an angle iron, or other suitable method, for support. The iron would rest on the lower portion of the inlet punch out and 2 feet onto solid ground in the trench.

Backfilling

The trench is to be backfilled with suitable material free of large stones and clumps of earth. The fill is to be firmly tamped during the backfilling process to prevent movement of the sewer.

Sewer lines passing within 50' of a nonpublic water supply source are to meet special construction requirements as required by the Health Department.

ITEM 2: Pretreatment Systems

Treatment Tank (Advantex AX 20 Mode 3)

All tanks to be installed as shallow as possible, out of low areas, isolated from surface drainage sources including drive, road, and gutters, and by methods to minimize and preferably eliminate water infiltration. Parge the inside and outside of the tank seam. Additional tarring and plastic wrapping of the outside may be indicated for additional protection. "Top Seam" tanks are required.

Placement

The tank is to be installed level onto a minimum of 6" of sand or fine gravel. The top of the tank is to be as close to the ground surface as possible to prevent infiltration. No more than 6-8" cover is advised.

Backfilling

Backfilling is to be performed in layers with sufficient tamping to avoid settling. Backfill material is to be free of large stones and debris.

ITEM 3 Conveyance to Pump Chamber.

The conveyance system from the treatment tank is to be constructed of Schedule 40 PVC pipe. The line is to be constructed, bedded, supported (as necessary), and back filled as outlined under Item 1, Building Sewer above.

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Maryland

DATE: May 22, 2009
REV: 7/17/09

TITLE :
General Notes "A"

DESIGNED BY: Tom W. Ashton R.E.H.S

ITEM 4: Pump Station

Pump chamber (Refer to Attachment)

A minimum 1000 **gallon pump chamber** (top seam) is required. Larger tank recommended as setbacks will allow. A Baystar product is specified.

The pump chamber is to be placed and backfilled as outlined in Item 2 above.

The pump chamber will have an access manhole terminating above the ground surface. A minimum width dimension of 24" with a shoe box cover is required. The crock is to be adequately sealed with waterstop to eliminate any surface water infiltration.

Drawdown (Refer to Attachment)

The **volume in gallons per inch is 22 + / - .** The **drawdown (LPD system dose) is to be 5" between the on and off float switches or approximatelly 110 gallons.** There is to be a minimum of a 3" separation between the off float switch and the high water alarm float switch. A **minimum of 20" +/- or 400 + / - gallons of reserve must be provided above the high water alarm float switch** to the inlet. This represents the minimum one quarter of the daily design sewage flow.

Pump

The site conditions and LPD design require a open face centrifugal pump rated for sewage effluent that will deliver 33 **gallons per minute against 19 feet of head.** This represents a **vertical (elevation) separation of 8 feet from the off float to the bottom (lowest lateral) of the LPD system.** The **"run" would be 100 feet of 2 inch pipe.** The pump is to be set on the bottom of the tank. The recommended pump is a Goulds WEO3M or equivalent. See Attachment.

Piping, Fittings (Refer to Attachment)

The pump chamber force main is to be constructed of 2 " pressure rated Schedule 40 PVC pipe. All joints and fittings are to be of the pressure type (PW) and assembled in accordance with manufacturers specifications.

From the pump a one eighth inch hole is drilled 2" above the low water level (lowest float switch) followed by a quick disconnect coupling. A cam lock coupling is required. A Schedule 80 union is acceptable. Assemble to provide for removal of pump without dewatering wet well.

A brass check valve is installed in a vertical position followed by a gate shut off valve. Where the forced main leaves the chamber seal with water stop.

Pump station piping and fittings are available pre-assembled from many plumbing supply houses.

ITEM 5: Pump Controls

All electrical work is to be performed by an electrician in accordance with manufacturers specifications.

Mercury float switches are to be utilized for the pump off (low water), pump on, and high water alarm controls. See Attachment. Place the floats so they are not affected by flow entering the pump chamber.

The wiring junction box located on the outside of the pump station is to carry a NEMA 3R rating. All wiring is to run to the house through conduit.

The control panel is inccorporated into the Advantex Control Unit. The panel must be located in an area where it may be easily monitored. The panel requires a master disconnect switch (@ house breaker box), a manual over ride switch, and separate circuits for the pump control and alarm system.

The control panel must contain a audiovisual high water alarm indicators. A Control and Alarm Panel produced by American Manufacturing of Manassas is required. It is very important that the control box be matched for the make and model of pump.

ITEM 6: Force Main

A 2" force main is required. The main is to be constructed with pressure rated materials and fittings (PW) in accordance with manufacturers specifications. The main is to be constructed, bedded, supported, and back filled as stated @ÆAÆin Item 1 above. The minimum depth is to be 24-30". Where the main leaves the pump chamber it is to be secured and bridged with an angle iron as stated in Item 1 above.

The 2 " forced main will travel to the valves 3' from and along the bottom line. A trencher or a 1' bucket is to be used in this area to minimize any disturbance and encroachment of the reserve area.

Where the forced main turns at 45 degrees or greater, a thrust block is to be constructed. The joint is to be encased in concrete for one foot either side of the turn.

Forced mains passing within 50' of any drinking water source are to be pressure tested as specified in section 4.23.A.5 of the Sewage Handling & Disposal Regulations.

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6726 Surrey Lane
Clarksville, MD 21029
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COUNTY : Howard County
Maryland

DATE: May 22, 2009
REV: 7/17/09

TITLE : General Notes "B"

DESIGNED BY: Tom W. Ashton R.E.H.S

ITEM 8: Distribution System

The distribution system is to be constructed of pressure rated Schedule 40 PVC pipe and fittings (PW).

Manifold The manifold lines are watertight lines that convey effluent from the valve to the pressure percolation lines (laterals). They are analogous to the "header" lines in a conventional drainfield. From the valve, the manifold diameter telescopes smaller uphill away from the valve. Where required an appropriate reducer is to be utilized.

The system is to be installed as to disturb as little of the area as possible. Do not bed manifolds on gravel. Use clean, tamped soil.

The manifold lengths and diameters are as specified in Attachment.

The manifold is identified in the field by stakes set at the top and bottom line.

Manifold/Lateral connection The manifold is best to be installed above the laterals and connect by way of a riser with the use of two tees (or 90's). This configuration will allow the manifold to drain down into the laterals when the pump turns off. In shallow installations, the manifold may be located at the ground surface and will require additional cover (>18").

Donot install with the manifold under the laterals or intersecting with one tee unless absolutely necessary.

Where the laterals leave the graveled adsorption trench, towards the manifold, they should be placed firm on undisturbed earth. See attachment.

Pressure percolation lines The absorption system consists of TWO lines, 3' wide, 72' long, with 8' centers at/and flowing from a side manifold. The installation depth is 48". The trench bottoms are to be installed flat and on contour.

All laterals are to be 1.5" in diameter. The laterals are to be installed flat in the horizontal center of the trench and maintain a straight alignment on contour. Grade boards and/or stakes are to be placed on <10' centers to maintain the gravel level for the placement of the laterals.

All laterals are to be fitted with a vertical riser and threaded cap extending to the ground surface. The 90 degree turn is to be accomplished by the use of two 45 degree fittings enabling ease of use as a cleanout. House in a minimum 6" meter housing with snap lid at surface. The lateral turnup is to be bedded within the housing with gravel, extending 2 inches above the gravel surface.

The hole size is 5/16". The lateral is to be placed in a straight line along the longitudinal axis of the pipe with the holes facing vertically down. Note that the first, and last holes are to be pointed vertically up, and housed in a small section of standard 4" drainfield pipe to act as a splash plate (utilization of orrifice shields on all hole as an alternative is acceptable). These holes will act as a vent allowing the laterals to charge quickly and drain freely when the pump turns off. The number and spacing of the holes, and distance to the first hole for each lateral are specified in Attachment. Holes to be drilled burr free.

From the manifold, there is 1' allowed for the manifold or "header" ditch, from there the lateral is to be bedded for 1'on natural, in place soil. See Attachment. This area is to be backfilled and tamped with the clayiest material available on site to prevent infiltration into the manifold ditch area. From that point the graveled absorption trench (72') will begin. **The total length of the 1.5" pipe will be 74'.** The distance from the first hole to the manifold side soil plug and from the last hole to the end of the lateral will vary and should be approximately equal. See Attachments.

Gravel The gravel is to be clean, as utilized for conventional leach lines and recommended to be between .5 to .75" in size. The minimum amoun@ÆAÆt of gravel under a lateral is 36". The lateral has a minimum of 2" gravel cover. Untreated building paper or other suitable material is to be placed over the gravel to prevent the migration of fines into the absorption trench during backfilling. See Attachment.

Relative lateral elevations Each lateral is to be placed at a specific elevation as specified in Attachment. The top lateral in each valve group is to be installed with the minimum 36" gravel underneath. The top lateral elevation represents a bench mark of zero. The following laterals will be installed at the specified lower elevation relative to the top lateral of the valve group. Additional gravel may be necessary to maintain the relative elevations.

The manifold is identified in the field by stakes set at the top and bottom line.

Lateral ends All lateral ends are to be fitted with a threaded end cap and brought to the surface as described above.

Inspection risers A vertical riser is to be provided at the end of the top and bottom lateral of each valve group. See Attachment. With the system pressurized, the valves will be adjusted until the water level is at the specified head elevation (pressure).

Once adjusted and prior to back filling, the risers are to be removed and the lateral fitted with a threaded cap to the ground surface, housed as described above.

Cover and backfilling The entire distribution system is to be backfilled and graded to provide a minimum of 12" cover over the gravel laterals. To build up cover over the area, additional material maybe required. The manifold area is to be firmly tamped during backfilling. All backfill material is to be free of large stones and debris. Final grade to be slightly mounded (turtle back) to divert surface runoff off and away from the site. Establish a lawn cover as soon as possible.

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6726 Surrey Lane
Clarksville, MD 21029
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COUNTY : Howard County
Maryland

DATE: May 22, 2009
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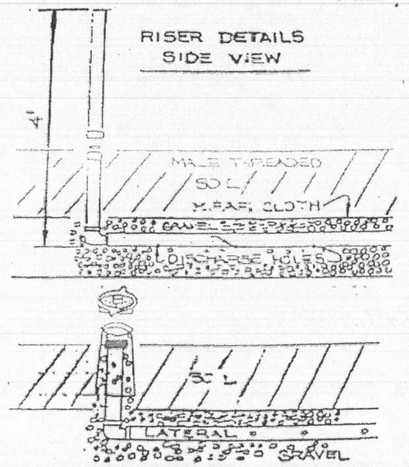
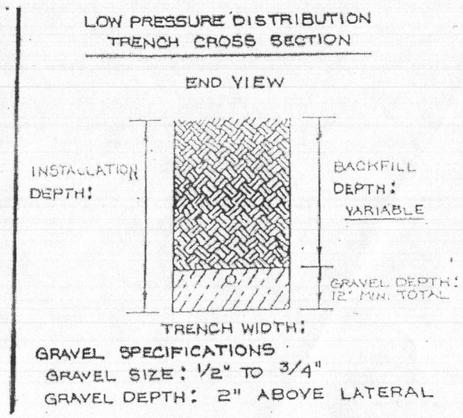
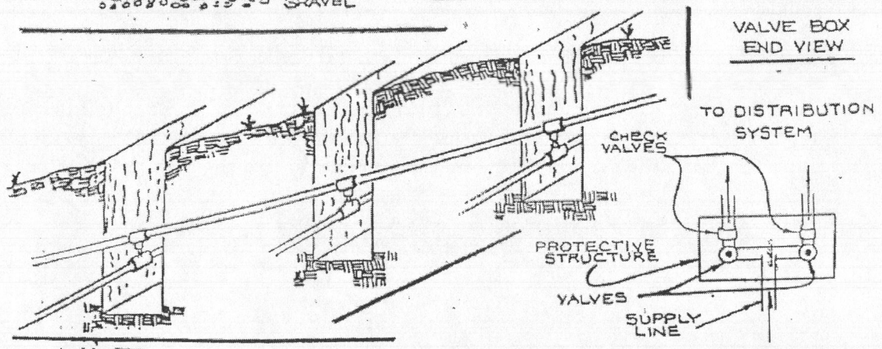
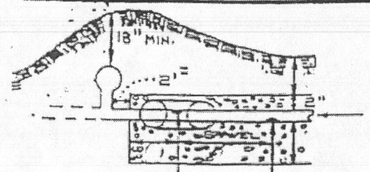
TITLE : General Notes "C"

DESIGNED BY: Tom W. Ashton R.E.H.S



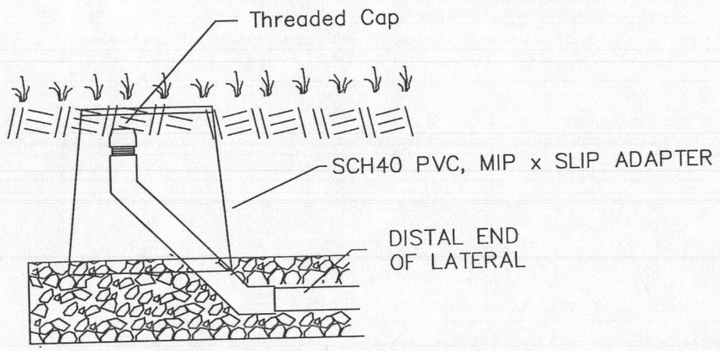




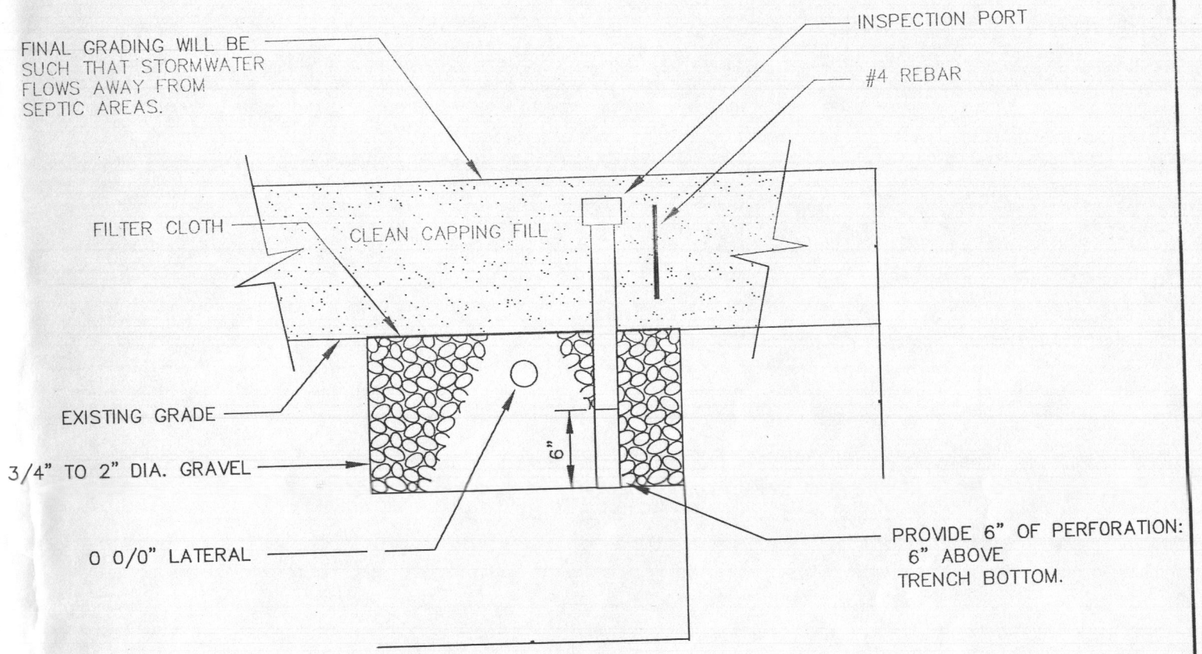


Ⓐ MANIFOLD DIAMETERS SPECIFIED
Ⓑ DISTANCE TO FIRST HOLE AS SPECIFIED.
Ⓒ HOLE SPACING AS SPECIFIED.

MANIFOLD/TRENCH CROSS SECTION



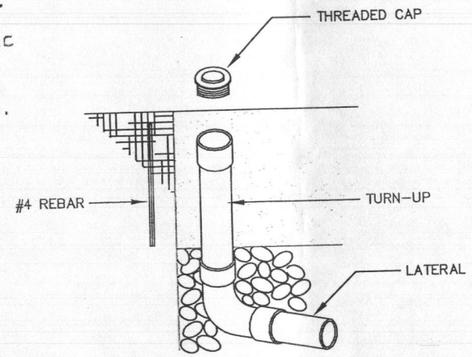
VALVE BOX DETAIL



TRENCH SECTION

N.T.S.

NOTE: DEPTH TO BOTTOM OF GRAVEL FROM FINISHED GRADE MAY VARY SLIGHTLY.



LATERAL CLEAN OUT

N.T.S.

AMERICAN MANUFACTURING CO.
5517 WELLINGTON ROAD, GAINESVILLE VA22065 PHONE : 703-754-0077

PROJECT NAME : Biggens
6726 Surrey Lane
Clarksville, MD 21029
Clarksville Ridge Lot 24
COUNTY : Howard County
Maryland

DATE: May 22, 2009
REV: 7/17/09

TITLE :
LPD Drainfield
DETAILS

DESIGNED BY: Tom W. Ashton R.E.H.S | SCALE : NTS | SHEET 9 OF 16

Biggens DESIGN INFORMATION

PUMP SIZING

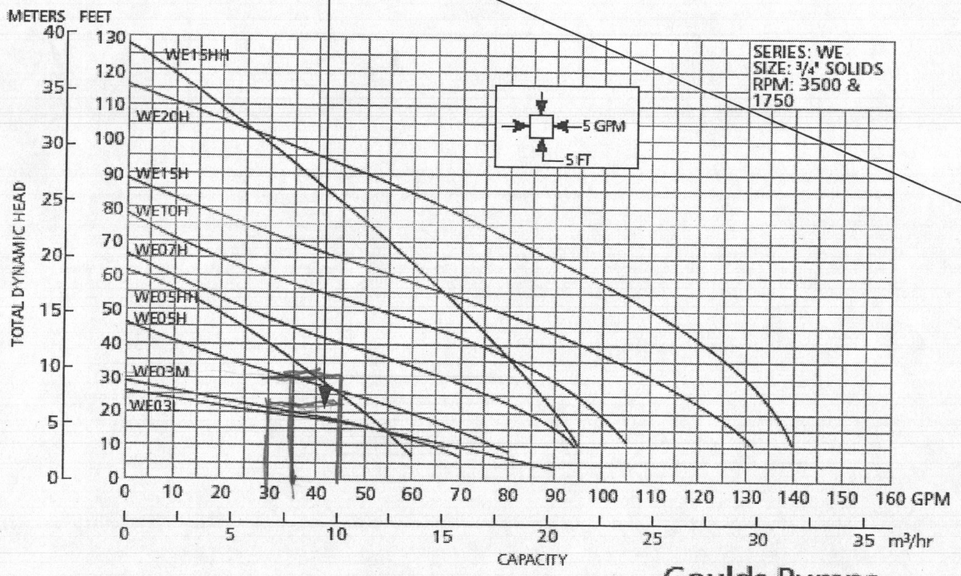
TOTAL DYNAMIC HEAD OF ABSORPTION SYSTEM @ lowest lateral (does not include valves)

A)	Elevation Across Field (ft.)		1.70	* This vaule (A) represents the total fall as field measured.
B)	+ Manifold Friction Loss Valve Group #	+	0.29	* These vaules (B-D) are the total friction loss in all the manifold segments per valve group.
C)	+			
D)	+			
E)	+ Lowest Distal Head (ft.)	+	2.00	* This (E) is the lowest distal head in the system.
F)	+ Total Lateral Friction Loss (ft.)	+	1.50	* Single lateral friction loss is 0.75 feet per 72.00 ft. line @ 11.63 GPM. (one half maximum lateral flow of 23.27 GPM.) The total lateral friction loss is 1.50 ft. The number of lines is 2.00
G)	Total Dynamic Head at Valves (ft.).	X 1.2	5.50	
H)	T D Head at bottom of system		6.59	* 20% is added to account for fittings within the system.
I)	Total System Flow Gallons per Minute	@ GPM	46.43	This vaule represents the head requirements of the lateral and manifold distribution system. Does not include supply line and valves.

TOTAL DYNAMIC HEAD FROM PUMP (Pump Sizing) Biggens

(K)	Supply Line Friction Los	+	4.82	* The supply line length= 100.00 feet. Equivalent length (length X 1.2 to acount for fittings) is 120.00 feet. The supply line diameter is 2.00 inches. The friction loss per 100' @ 46.43 GPM is 4.02 feet. The friction loss for 120.00 feet of 2.00 inch pipe = 4.82 feet.
(L)	Pump Station Friction lo	+	3.06	* The pump chamber piping is constructed of 2" diameter materials. The equivalent length of a typical standard configuration (gate valve, check valve etc.) is 75 feet. At a system flow of 46.43 GPM with a friction loss of 4.09 feet per 100', the pump station friction loss = 3.06 feet.
(M)	Total elevation from pun	+	8.00	* Elevation from pump to LPD system bottom includes pump at 6' below ground surface.
(N)	Friction loss for LPD system.	+	6.59	* This value is "H" above.
(O)	Total Dynamic Head Required	@ 46.43 GPM	22.47	* See attached pump curve for recommended pump.

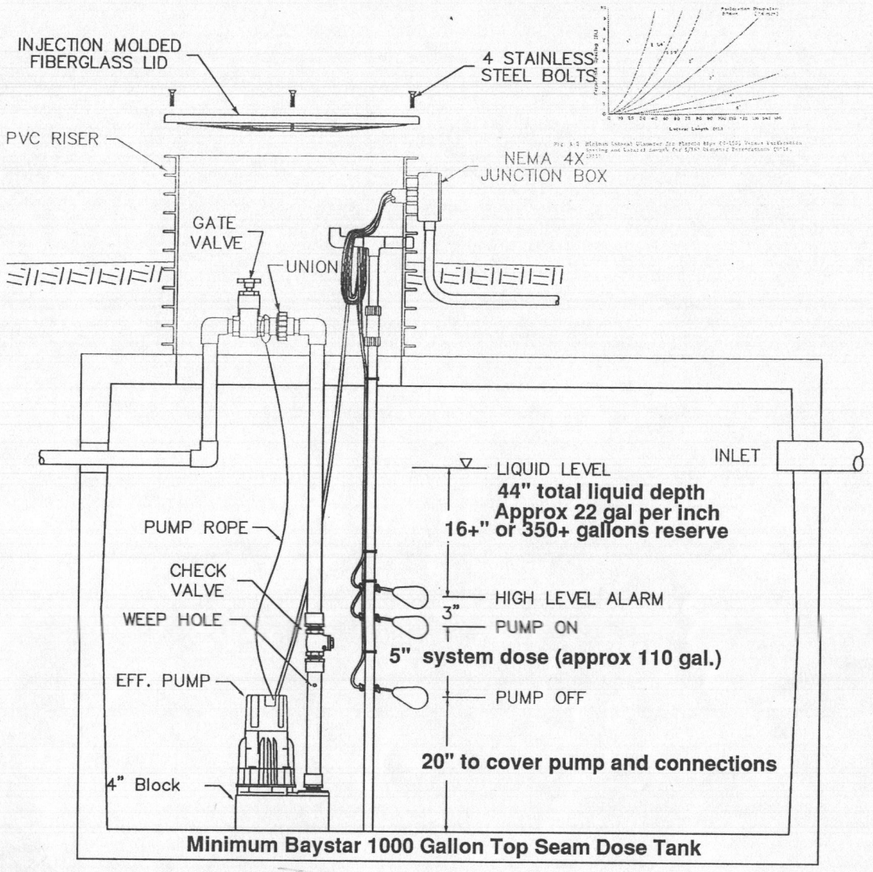
17' 8"
3' 10"



Goulds Pumps

ITT Industries

www.goulds.com



Minimum Baystar 1000 Gallon Top Seam Dose Tank

PERFORMANCE RATINGS (gallons per minute)

Order No.		WE03L	WE03M	WE05H	WE07H	WE10H	WE15H
	HP	⅓	⅓	½	¾	1	1½
	RPM	1750	1750	3500	3500	3500	3500
Total Head Feet of Water	5	86	–	–	–	–	–
	10	70	63	78	94	–	–
	15	52	52	70	90	103	128
	20	27	35	60	83	98	123
	25	–	–	48	76	94	117
	30	–	–	35	67	88	110
	35	–	–	22	57	82	103
	40	–	–	–	45	74	95
	45	–	–	–	35	64	86
	50	–	–	–	25	53	77
	55	–	–	–	–	40	67
	60	–	–	–	–	30	56
	65	–	–	–	–	20	45

SYSTEM DOSE (Simplex)

Seven X Dose		Ten X Dose	
Lateral Volume (gal.)	11.19 X 7	Lateral Volume (gal.)	11.19 X 10
Total	78.32	Total	111.89
Plus Manifold Vol. (gal.) +	1.37	Plus Manifold Vol. (gal.) +	1.37
Total "Seven X Dose" (Gallons)	79.70	Total "Ten X" Dose (gallons)	113.30

Goulds WEO5H or Equivalent, VERIFY LIFT and DISTANCE

Tom W. Ashton R.E.H.S

P.O. Box 220 Bluemont VA 20135 540-454-4672

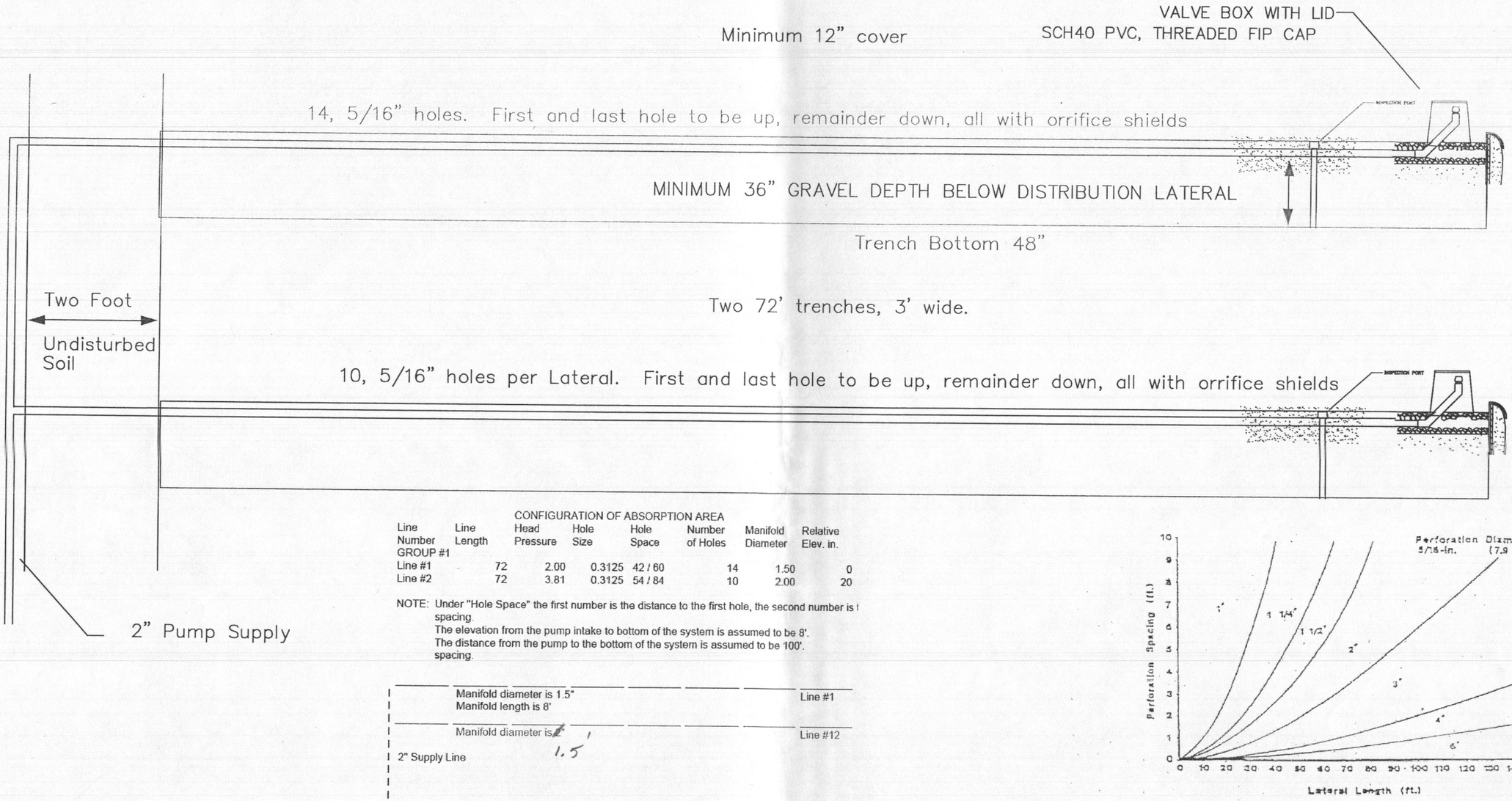
PROJECT NAME : Biggens
6726 Surrey Lane
Clarksville, MD 21029
Clarksville Ridge Lot 24

COUNTY : Howard County Maryland

DATE: May 22, 2009
REV: 7/17/09

TITLE : Pump Information

DESIGNED BY: Tom W. Ashton R.E.H.S



CONFIGURATION OF ABSORPTION AREA

Line Number	Line Length	Head Pressure	Hole Size	Hole Space	Number of Holes	Manifold Diameter	Relative Elev. in.
GROUP #1							
Line #1	72	2.00	0.3125	42 / 60	14	1.50	0
Line #2	72	3.81	0.3125	54 / 84	10	2.00	20

NOTE: Under "Hole Space" the first number is the distance to the first hole, the second number is t spacing.
The elevation from the pump intake to bottom of the system is assumed to be 8'.
The distance from the pump to the bottom of the system is assumed to be 100'.
spacing.

Manifold diameter is 1.5" Manifold length is 8' — Line #1

Manifold diameter is 2" 1.5 — Line #12

2" Supply Line

(A) Line(s) Number	(B) Distal Head Pressure (ft.)	(C) Hole Size (in.)	(D) Number of Holes per Line	(E) Flow per Hole (GPM)	(F) Lateral Flow (GPM)	(G)	(H) Manifold Flow (Side) (GPM)	(I)	(J) Line(s) Length (ft.)	(K) Hole Space (in.)	(L) Manifold Diameter (in.)	(M) Manifold Velocity (ft/sec)	(N) Manifold Length (ft.)	(O) Manifold Friction Loss (ft.)	(P) Elevation to next Lateral (ft.)	(Q) Next Line Head (B+O+P) (ft.)	(R) Flow per Linear Ft. (F/J) (gal.)	Line(s) Number
GROUP #1																		GROUP #1
Line #1	2.00	0.3125	14	1.650	23.16		23.16		72	42 / 60	1.50	7.30	8	0.15	1.67	3.81	0.32	Line #1
Line #2	3.81	0.3125	10	2.260	22.64		46.00		72	54 / 84	2.00	8.80	3	0.06			0.32	Line #2

* ADDITIONAL INFORMATION

Exact slope of site(%) = (Fall of site / Length of site) X 100
(1.70 ft. / 8.00 ft.) X 100 = 21.30 %.

% Flow Variation of laterals (during pump run) = ((Maximum flow-Minimum flow)/Minimum flow) X 100
((0.32 - 0.32) / 0.32) X 100 = 1.40 %.

Installation depth is 48.00 inches (minimum if variable).

Fig. A-2. Minimum Lateral Diameter for Plastic Pipe (C=150) Versus Perforation Spacing and Lateral Length for 5/16" Diameter Perforations (Otis, 1981)

Tom W. Ashton R.E.H.S
P.O. Box 220 Bluemont VA 20135 540-454-4672

PROJECT NAME : Biggens
6726 Surrey Lane
Clarksville, MD 21029
Clarksville Ridge Lot 24
COUNTY : Howard County Maryland

DATE: May 22, 2009
REV: 7/17/09

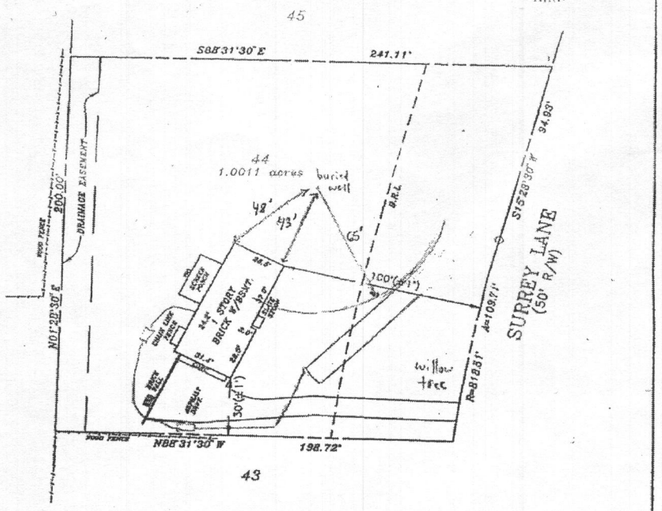
TITLE : LPD Details

DESIGNED BY: Tom W. Ashton R.E.H.S

LOCATION DRAWING
6726 SURREY LANE
LOT 44
CLARKSVILLE RIDGE
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

STATE OF MARYLAND — RONALD LANE COLLIER — No. 307 — REGISTERED PROPERTY LINE SURVEYOR

SCALE: 1"=50'



"THE SUBJECT DWELLING DOES NOT LIE WITHIN A FLOOD HAZARD ZONE AS SHOWN ON HUD FLOOD INSURANCE STUDIES"

HOUSE LOCATION SURVEY: 5/19/95

SURVEYORS CERTIFICATE

I hereby certify that the position of the existing improvements shown hereon have been carefully established by accepted land surveying practices and that, unless shown, there are no visible encroachments either way across the property lines. The plan is of benefit to a consumer only insofar as it is required by a lender or a title insurance company or its agent in connection with contemplated transfer, financing or refinancing. The plan is not to be relied upon for the establishment or location of fences, garages, buildings, or other existing or future improvements. The plan does not provide for the accurate identification of property boundary lines, but such identification may not be required for the transfer of title or securing financing or refinancing. This drawing was prepared in the benefit of a title report.

5-19-95
RONALD L. COLLIER
REG. PROPERTY LINE SURVEYOR
MD. NO. 307

Charles P. Johnson & Associates, Inc.
PLANNERS • ENGINEERS • LANDSCAPE ARCHITECTS • SURVEYORS
1751 ELTON ROAD SILVER SPRING, MARYLAND 20903
(301)434-7000 Fax(301)434-7010 FREDERICK, MD - FAIRFAX, VA

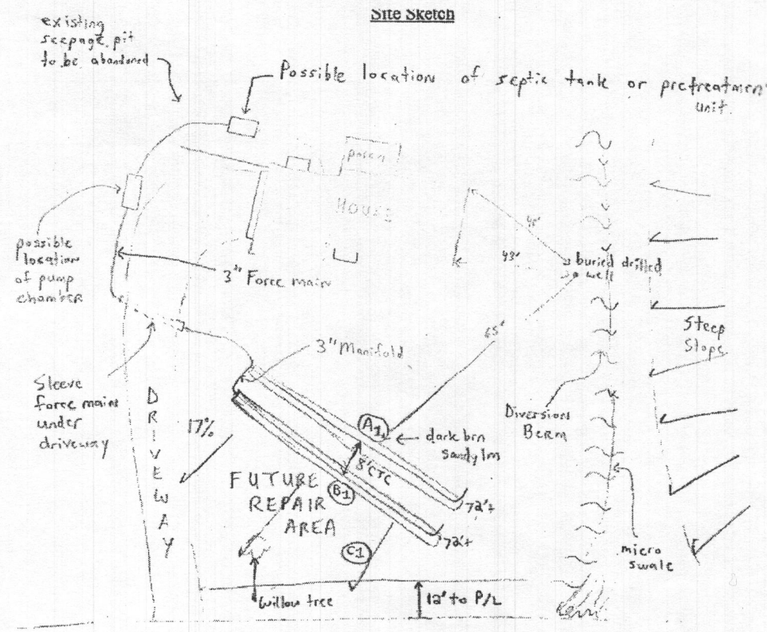
REFERENCE	Drawn by BLT	Checked by RLC
Plat Book 7	Date 5/23/95	Record No.
Plat No. 29	Scale 1"=50'	23-078-91.03

TEST DATA

NAME Robins Biggins — FILE NO
LOCATION Clarksville Ridge Lot 44 — COUNTY Howard
6726 Surrey Lane — DATE 10/15/08
Clarksville, MD 21029 — GRID E
RECORDED BY Steven R. Krug / Stuart Oster — N

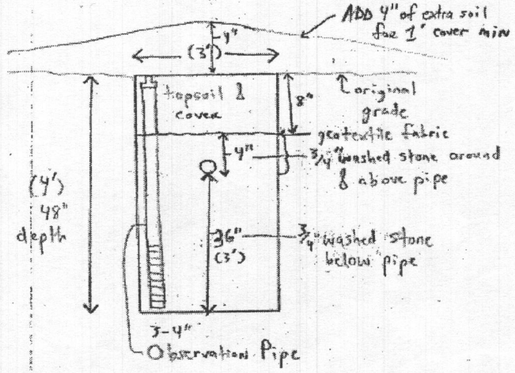
HOLE NO.	TEST NO.	DEPTH	CLOCK TIME	ELAPSED TIME	MEASUREMENT	REMARKS (Method, Moisture, Biopores)
A1	A1	6" below grade	12:16	—		STD. PERC HOLE 1'X1'
			12:18	2min	5"	w/ PERC STICK
			12:22	4min	4"	4mpi
B1	B1	1' below grade	12:38	—		STD. PERC HOLE 1'X1'
			12:48	10min	5"	w/ PERC STICK
			1:03	15min	4"	15mpi
C1	C1	18" below grade	1:45	—	18"	
			1:50	5min	17 4/16"	6.6mpi
			1:55	5min	16 "/16"	8.8mpi
			2:00	5min	16 6/16"	16mpi
			2:05	5min	16"	13mpi
						Open hole Test w/ hook gauge 15mpi ±

Site Sketch



TRENCH PROFILE

width 36" (3')



Tom W. Ashton R.E.H.S
P.O. Box 220 Bluemont VA 20135 540-454-4672

PROJECT NAME : Biggens
6726 Surrey Lane
Clarksville, MD 21029
Clarksville Ridge Lot 24
COUNTY : Howard County Maryland

DATE: May 22, 2009
REV: 7/17/09
TITLE : MDE Evaluation

DESIGNED BY: Tom W. Ashton R.E.H.S

SHEET: 13 OF 16

MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard • Baltimore MD 21230
410-537-3000 • 1-800-633-6101

Martin O'Malley
Governor

Anthony G. Brown
Lieutenant Governor

Shari T. Wilson
Secretary

Robert M. Summers, Ph.D.
Deputy Secretary

December 10, 2008

Mr. Bert Nixon, Director
Howard County Health Department
Bureau of Environmental Health
7178 Columbia Gateway Drive
Columbia, Maryland 21046

RE: **Biggins Property**
Clarksville Ridge, Lot 44
6726 Surrey Lane
Clarksville, MD 21029

Dear Mr. Nixon:

I have reviewed your site evaluation data from your file and further evaluated the site with Stuart Oster of your office on October 15, 2008. The results of our site evaluation indicate the site is suitable for an advanced pretreatment unit followed by the installation of an LPD (low pressure dosing) system. LPD systems have several advantages in that they improve distribution through pressurized laterals that disperse the effluent uniformly throughout the entire drainfield area in conjunction with periodic dosing and resting cycles, which enhance and encourage aerobic conditions in the soil. Since the proposed system location will require a variance to reduce the setback to the existing buried well, the installation of an LPD system versus pumping to a standard gravity distribution box system is recommended.

The property owner may wish to contact a qualified soils and onsite system design consultant if they feel that other options for this property should be explored or proposed. The following sections summarize requirements necessary for proceeding with the project.

Pretreatment

Employing advanced pretreatment on septic tank effluent is beneficial from the standpoint of enhancing the soil absorption component of the system's performance and extending its life. There are a variety of devices and methods for providing advanced pretreatment, including constructed wetlands, aerobic pretreatment units, fabric biofilters, single pass and recirculating sand filters, peat filters, composting toilets, and greywater re-use systems.

Advanced pretreatment units that can reduce nitrogen compounds are preferred and may be eligible for grant funding through MDE's Bay Restoration Fund. The property owner's consultant may have preferences for a pretreatment unit to complement the soil absorption system selected. A good comparison of some pretreatment units can be found at the EPA's New England's Center for Environmental Industry and Technology (CEIT) web site at:
http://www.epa.gov/region1/assistance/ceitts/wastewater/techs.html.

Pretreatment units eligible for grants from MDE's Bay Restoration Fund are listed at:
http://www.mde.state.md.us/Water/CBWRF/osds/brf_bat.asp

Soil Absorption Component

The soil loading rates are based on the soil morphology observed in the test pits, and percolation testing (see attachments). The loading rates indicated are in conformance with MDE's alternative systems policy and the Tyler chart included with this letter. If utilizing pretreated effluent with low pressure trenches (LPD), a 0.7 gpd/sq.ft. loading rate is recommended.

The initial system for a four bedroom house would require 143 linear ft (2-72 ft trenches if equal length) of shallow pressure dosed trenches assuming the soil evaluations indicate a design where trenches are 3 feet wide, 4 feet deep with 3 feet of effective sidewall. This will provide 857 sq. ft. of absorption area and will satisfy the recommended loading rate of 0.7 gpd/sq.ft. for a four bedroom max design flow of 600 gpd. Alternatively, a more conservative design assuming only 2 ft of effective sidewall would require 180 linear feet (3-60 ft trenches if equal length). The designer should chose the option that works best for the site, taking into consideration contour, trench spacing and room for future repair.

Septic Tank(s) and Pump Chamber

A top seam two-compartment septic tank with a total capacity of 1500 gallons should be provided. The volume of the first chamber should be 1000 gallons. Access for an effluent filter should be provided at the outlet of the second chamber. Since advanced pretreatment is required, the septic tank size may vary depending on the design of the pretreatment unit selected and may comprise only one tank of a smaller size prior to the pretreatment unit/chamber/tank. The pretreatment unit itself may incorporate the tankage required for the settling of solids usually provided by the septic tank.

A top seam pump chamber should be included that is a minimum volume of 1,000 gallons. This may allow for dosing of the effluent as well as one day's storage above a high water alarm which is required.

As always, an inspection should be conducted to evaluate all tanks for water tightness.

Plans and Specifications

It is recommended that a qualified on-site systems design consultant be retained by the property owner to provide final plans and specifications for the system. Enclosed are MDE minimum requirements for the submission of acceptable plans. Alternative system design review can be handled by the county, but I will be available to assist with this review. Initially, one set of plans must be submitted to your office and one set to MDE's Onsite System's Division.

Agreement and Easement

An Agreement and Easement needs to be signed by all parties, recorded in the land records and returned to the local Approving Authority and MDE before permits to construct can be issued. The Agreement and Easement establishes the regulatory conditions associated with the project. A combined BRF and Alternative Agreement is available and preferred if a BRF grant funded system is employed. Contact the BRF program for additional information.

Location of Utility Lines

The location of any utilities leading from the street to the house must be located to determine the feasibility of using the front yard for a sewage disposal system.

Upslope Drainage Diversion

Construction of a small diversion swale and berm along the right side of the property as seen when facing the house from the road, should be performed to intercept and collect surface runoff from the upslope drainage areas and divert water away from the LPD dispersal system. Diversion of roof rain drainage, and surface water from upslope areas around the back of the house should also be considered for the installation of the septic tanks or pretreatment units.

Variance

The property is currently served by a drilled well buried below grade and although up gradient of the proposed system, it will be located less than 100 feet to the proposed system location (Approximately 65 ft). A variance is required to reduce the setback distance. Please have the property owner send a request in writing to your office. Code of Maryland Regulations (COMAR 26.04.02) contains a reasonable provision for such variances to be granted by the MDE upon the recommendation of the Approving Authority.

Howard Co. Health Dept
Env. Health - Mike Davis

Linked Deposit

Additional financial assistance may be available for this project through the Department of the Environment's Linked Deposit Program. Information concerning this loan program:
http://www.mde.state.md.us/Programs/WaterPrograms/Water_Quality_Finance/Link_Deposit/index.asp

Bay Restoration Fund

Information on the Bay Restoration Fund (BRF) which may provide a grant to cover the cost of a nitrogen reducing aerobic pretreatment unit, is available on MDE's website.
http://www.mde.state.md.us/Water/CBWRF/osds/index.asp The BRF project manager for your county may provide additional information. The BRF Hotline is (410) 537-4195.

A copy of the site evaluation data is enclosed. Please forward a copy of this letter and the attachments to the property owner. If you have questions regarding this matter please call me at (410) 537-3680 or email at skrieg@mde.state.md.us.

Sincerely,

Steven R. Krieg, R.S

Steven R. Krieg, R.S.
Regional Consultant, On-Site Systems Division

Attachments

cc: Barry Glotfelty
John Boris

Tom W. Ashton R.E.H.S
P.O. Box 220 Bluemont VA 20135 540-454-4672

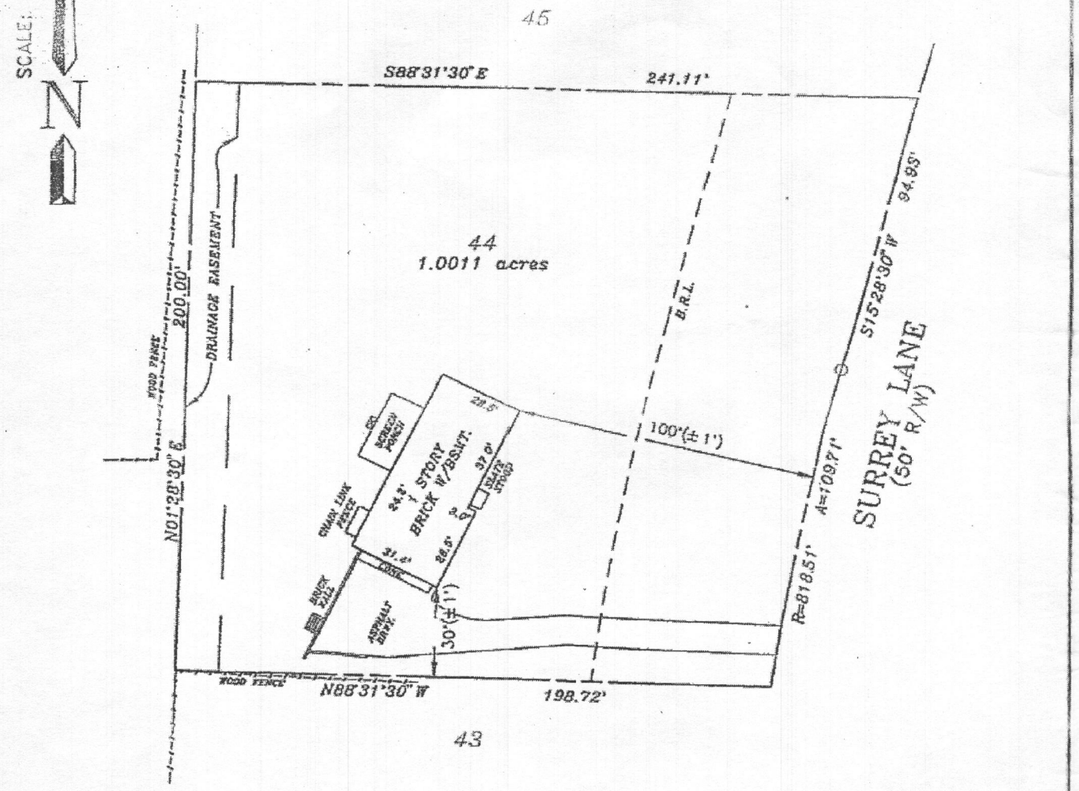
PROJECT NAME : Biggens
6726 Surrey Lane
Clarksville, MD 21029
Clarksville Ridge Lot 24
COUNTY : Howard County Maryland

DATE: May 22, 2009
REV: 7/17/09
TITLE : MDE Letter

DESIGNED BY: Tom W. Ashton R.E.H.S

LOCATION DRAWING
6726 SURREY LANE
LOT 44
CLARKSVILLE RIDGE
FIFTH ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

STATE OF MARYLAND
RONALD LANE COLLIER
No. 307
REGISTERED
PROPERTY LINE SURVEYOR



"THE SUBJECT DWELLING DOES NOT LIE WITHIN A FLOOD HAZARD ZONE AS SHOWN ON HUD FLOOD INSURANCE STUDIES"

HOUSE LOCATION SURVEY: 5/19/95

SURVEYORS CERTIFICATE

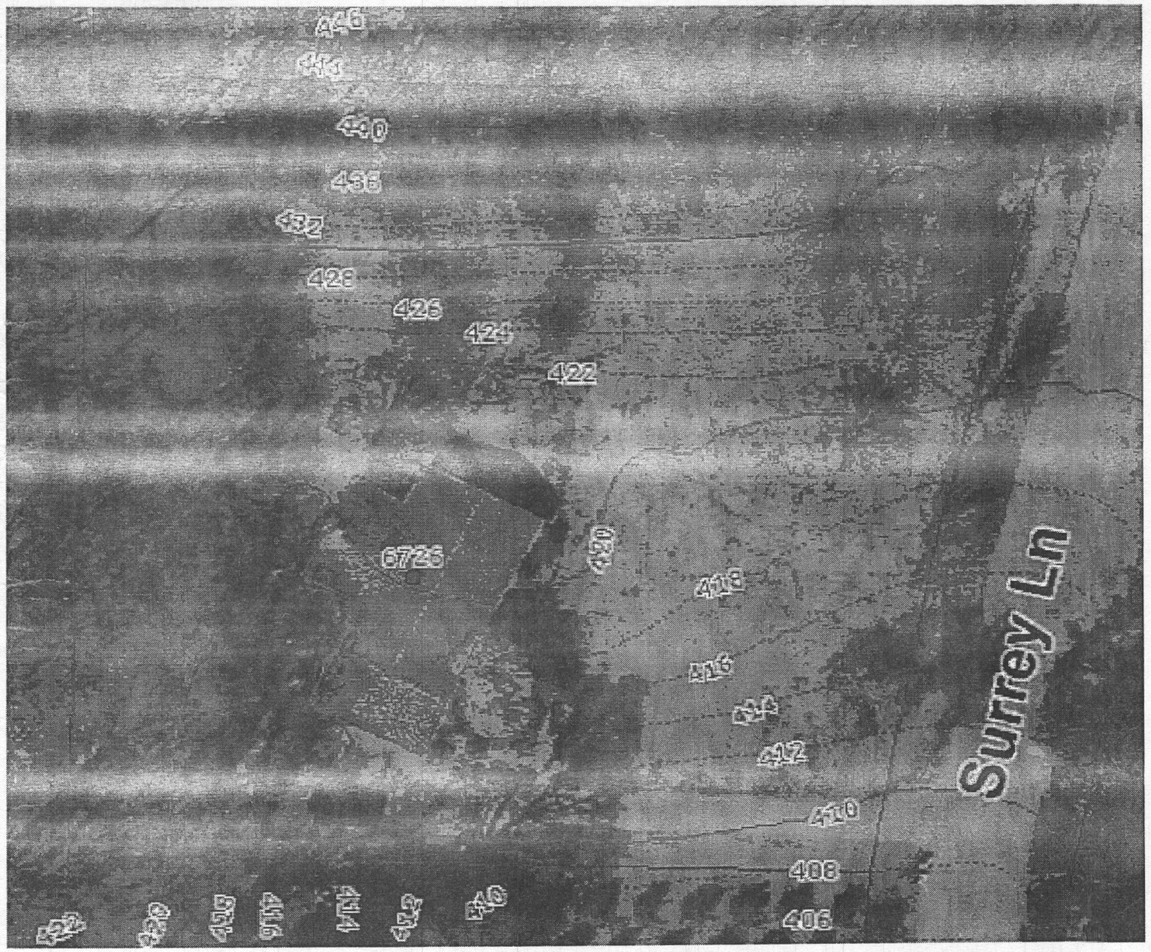
I hereby certify that the position of the existing improvements shown hereon have been carefully established by accepted land surveying practices and that, unless shown, there are no visible encroachments either way across the property lines. The plan is of benefit to a consumer only insofar as it is required by a lender or a title insurance company or its agent in connection with contemplated transfer, financing or refinancing. The plan is not to be relied upon for the establishment or location of fences, garages, buildings, or other existing or future improvements. The plan does not provide for the accurate identification of property boundary lines, but such identification may not be required for the transfer of title or securing financing or refinancing. This drawing was prepared w/o the benefit of a title report.

5-19-95

RONALD L. COLLIER
REG. PROPERTY LINE SURVEYOR
MD. NO. 307

Charles P. Johnson & Associates, Inc.
PLANNERS • ENGINEERS • LANDSCAPE ARCHITECTS • SURVEYORS
1751 ELTON ROAD SILVER SPRING, MARYLAND 20903
(301)434-7000 Fax(301)434-7010 FREDERICK, MD – FAIRFAX, VA

REFERENCE	Drawn by BLT		Checked by RLC	
Plat Book 7	Date 5/23/95		Record No.	
Plat No. 29	Scale 1"=50'		23-078-91.03	



Tom W. Ashton R.E.H.S
P.O. Box 220 Bluemont VA 20135 540-454-4672

PROJECT NAME : Biggens
6726 Surrey Lane
Clarksville, MD 21029
Clarksville Ridge Lot 24

COUNTY : Howard County
Maryland

DATE: May 22, 2009
REV: 7/17/09

TITLE :
House Location TOPO

DESIGNED BY: Tom W. Ashton R.E.H.S

SHEET: 15 of 16

HOMEOWNER OPERATION and MAINTENANCE

The homeowner is the owner of the onsite system and is ultimately responsible for its proper use / operation and acceptable performance. It is recommended that the owner be familiar with this design package, and the components of the system. The owner is required to operate, monitor, and maintain the system as outlined below.

Remember, improper contact with sewage and electricity may be fatally hazardous.

All materials accompanying specific components such as the Treatment Unit, pump, and control panel are to be retained and kept with this package.

System Overview / Sequence of Operation

Household sewage enters the Advantex Treatment Unit by way of a standard gravity sewer line. The treatment system is sized to treat the maximum daily flow (600 gallons per day).

The dosing chamber contains a pump that is activated by floats within the pump chamber. The pump and floats have grade access by way of a riser. There are three floats, with the lowest float being the pump off float. When the effluent level rises to the second float, the pump will activate and evacuate the chamber, dosing the drainfield until the lower, "off" float terminates the cycle. A third, upper most float, located above the "on" float will sound in the event of pump, float switch, or control system failure. A minimum of 25% of maximum daily emergency flow storage is provided above this float. If this alarm sounds call the installation contractor or a plumber.

In addition to the dose chamber floats and pumps, the pumping system includes a control panel, part of the Advantex control. The panel provides for manual operation of the pump, and testing of the alarm. An audiovisual high water alarm is encompassed in the panel.

A pressurized pump delivery line deposits the effluent to low pressure distribution system (LPD). The LPD system consists of pressure control valves followed by a supply manifold with the leach line distribution laterals branching to the graveled trenches. These dosing laterals are 1.25" in diameter with a specified size and number of holes. By design, when the pump activates the effluent is distributed equally throughout the length of all the trenches.

General Use Guidelines

The drainfield system is a biological treatment system that utilizes natural process to renovate and recycle wastewater into the environment. When properly used and maintained the system will give many years of service with little or no impact on the public health and environment.

Further, more efficient aerobic (with oxygen) treatment takes place within the drainfield at the soil interface and the unsaturated zone below.

As a biological treatment system, care should be taken with what is disposed into the system. Inorganic material such as feminine hygiene material, disposable diapers, plastics, synthetic rubber products, contraceptives, cigarettes, cat litter, and medications are not to be disposed into the system. Other materials that have a resistance to ready biologic treatment such as laundry lint, hair (cat feces), coffee grounds, and grease should be limited and should only enter the system incidentally.

Common household chemicals such as drain cleaner, disinfectants, and bleach should not effect the system when used in the quantities and frequencies recommended by the manufacturer. Under no circumstances are paints, solvents, pesticides / herbicides, petroleum products, and other similar materials to enter the system.

The system may become hydraulically overloaded and fail if abused through overuse, excessive peak use (laundry day), plumbing□Ø□□ fixture leakage, or surface water is allowed to enter the system. Footer drains, sump pump discharges, water treatment backwash, air conditioner condensation discharges, swimming pools, and other non sewage flows are not to be disposed into the system.

Surface, drive, and roof water should be directed away from the drainfield, and the finished grade should promote good surface drainage without ponding of water near the drainfield.

The drainfield area should receive only the most passive use. There should be no activity during wet periods. The area is not to be used for parking, material storage, intense recreation or any other activity that may cause compaction or erosion. Compaction will limit the oxygen exchange with the surface, compromising the treatment capacity of the drainlines, and may cause premature clogging of the soil.

The drainfield area should be maintained in an aggressive turf cover, cut to a moderate to long length. Do not plant maple, weeping willow, sycamore, cottonwood, locust, mimosa, or bamboo on or within 50' of drainfield. These and other known hydrophilic plants may enter and clog the systems . Do not mulch over system.

Required Operational Monitoring and Maintenance

Following are the minimum monitoring and maintenance procedures and frequencies. A log of activity should be maintained. Refer to manufacture's recommendations for additional information on specific components.

Note sewage and electricity may be fatally hazardous. Contact installation contractor, plumber, pumper, or electrician for specialized maintenance or repair.

Every 6 months
** Inspect pump chamber access risers interiors for signs of surface water infiltration.
** Visually inspect pump chamber for loose or tangled floats, solids etc.
** At pump control panel manually test the alarm and manual pump override.
** Inspect condition of valve box and distal end pipe housings.
** Walkover drainfield area and inspect for ponding and moist areas. I f noted, cause could be from hydraulic overload (plumbing leaks, overuse, infiltration), or broken or clogged pipe. System flushing frequency may be indicated.

Every Year
** Inspect the sludge level in the pump chamber. This may be performed with the use of a "sludge judge" or by a licensed septic tank pumper.

Lateral Flushing

The distal end of the distribution laterals have grade access for periodic testing and flushing. Additionally, grade access pressure adjustment valves are located at the lowest portion of the system. The frequency of lateral flushing will typically depend primarily upon the use of the system. Yearly flushing should be assumed.

Pump run times to evacuate the chamber vary with each design but are typically approximately five minutes. Shorter runs are acceptable, longer may indicate lateral orifice plugging, indicating a need for flushing. Contact the Health Department, septic tank pumper, contractor, or other service provider for acceptable flushing procedures.

Tom W. Ashton R.E.H.S
P.O. Box 220 Bluemont VA 20135 540–454–4672

PROJECT NAME : Biggens
6726 Surrey Lane
Clarksville, MD 21029
Clarksville Ridge Lot 24
COUNTY : Howard County
Maryland

DATE: May 22, 2009
REV: 7/17/09

TITLE :
General Operation

DESIGNED BY: Tom W. Ashton R.E.H.S