

PUB. SEWER STATUS VERIFIED BY _____

ISSUE DATE: 05/25/07

P 526737

APPROVAL DATE: 12/5/07 **PERMIT**
Logged Into Permit Manager
Tax ID # 03-304272

A REPAIR

**ON-SITE SEWAGE DISPOSAL SYSTEM
HOWARD COUNTY HEALTH DEPARTMENT
BUREAU OF ENVIRONMENTAL HEALTH**

Fogles Septic Clean, Inc. IS PERMITTED TO INSTALL ALTER

ADDRESS: 580 Obrecht, Sykesville PHONE NUMBER: 410-795-5670

SUBDIVISION: Annandale LOT NUMBER: 4

ADDRESS: 1711 Underwood Road PROPERTY OWNER: L. Jerry Lewis

SEPTIC TANK CAPACITY (GALLONS): _____

PUMP CHAMBER CAPACITY (GALLONS): _____

NUMBER OF BEDROOMS: 4

SQUARE FEET PER BEDROOM: _____

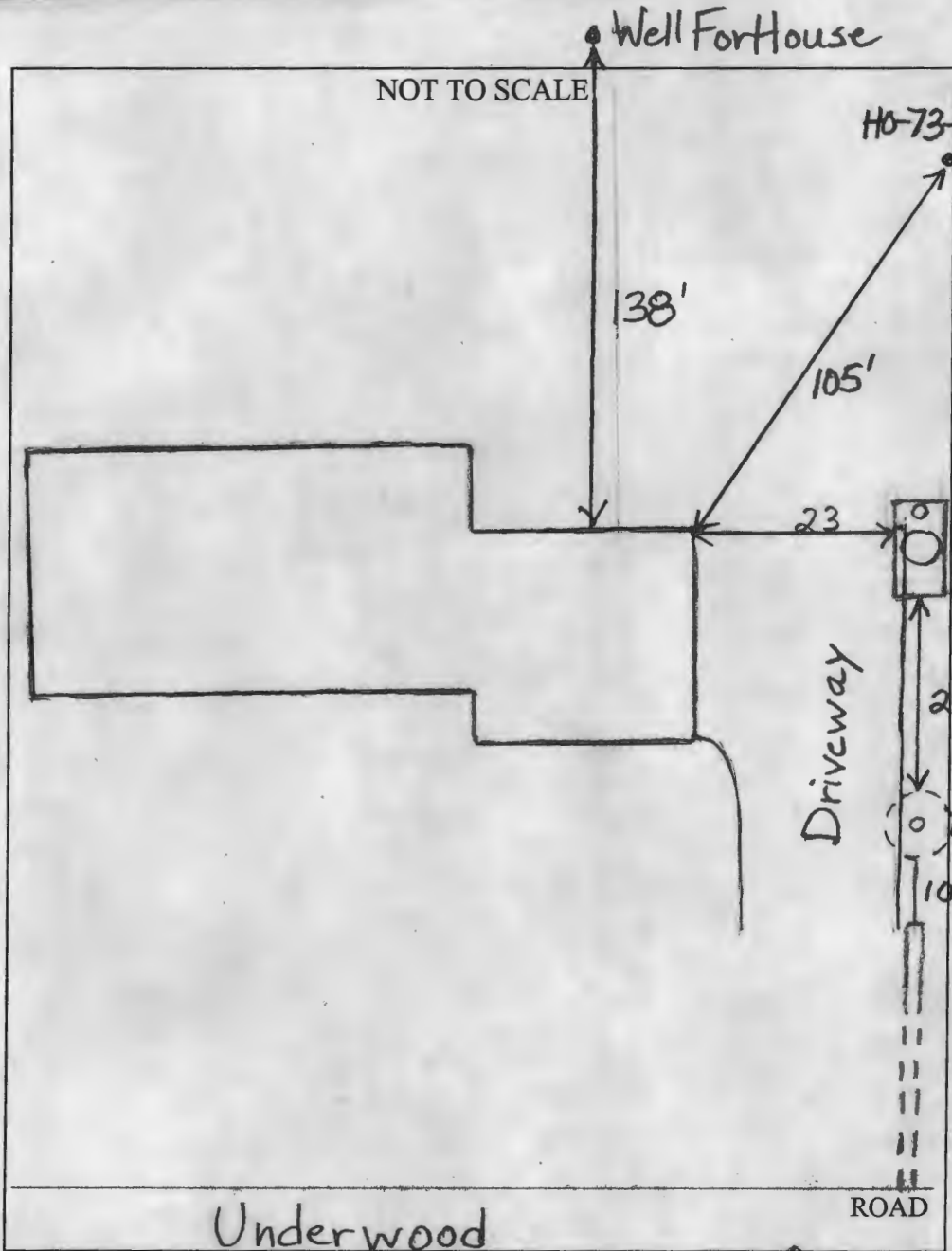
LINEAR FEET OF TRENCH REQUIRED: _____

TRENCHES:	Trench to be _____ feet wide. Inlet _____ feet below original grade. Bottom maximum depth _____ feet below original grade. Effective area begins at _____ feet below original grade. _____ feet of stone below distribution pipe.
LOCATION:	
PURPOSE:	Existing septic system has failed. Call for inspection when ground is opened so sanitarian can recommend repair.

PLANS APPROVED: B. Baker DATE: 10/30/07

- NOTE: PERMIT VOID AFTER 2 YEARS
- NOTE: CONTRACTOR RESPONSIBLE FOR SCHEDULING A PRE-CONSTRUCTION INSPECTION FOR ALL INSTALLATIONS
- NOTE: WATERTIGHT SEPTIC TANKS REQUIRED
- NOTE: ALL PARTS OF SEPTIC SYSTEM SHALL BE 100 FEET FROM ANY WATER WELL
- NOTE: MANHOLE RISERS REQUIRED ON ALL SEPTIC TANKS AND PUMP CHAMBERS

NEITHER THE HOWARD COUNTY COUNCIL OR THE HEALTH DEPARTMENT IS RESPONSIBLE FOR THE SUCCESSFUL OPERATION OF ANY SYSTEM PERMITTEE RESPONSIBLE FOR OBTAINING FINAL APPROVAL ON THIS PERMIT CALL 410-313-2640 FOR INSPECTION OF SEPTIC SYSTEM



TRENCH DRAINFIELD DATA

WIDTH	INLET	BOTTOM
_____	_____	_____
NUMBER OF TRENCHES _____		
TOTAL LENGTH _____		
ABSORPTION AREA _____		
DISTRIBUTION BOX LEVEL _____		
DISTRIBUTION BOX BAFFLE _____		
DISTRIBUTION BOX PORT _____		

SEPTIC TANK DATA

SEPTIC TANK 1 LEVEL	Yes
CAPACITY	_____ GAL
SEAM LOC	Midseam
TANK LID DEPTH	3.5'
BAFFLES	Yes
BAFFLE FILTER	No
MANHOLE LOC	Middle
6" PORT LOC	Front
WATERTIGHT TEST	No
SEPTIC TANK 2 LEVEL	N/A
CAPACITY	_____ GAL
SEAM LOC	_____
TANK LID DEPTH	_____
BAFFLES	_____
BAFFLE FILTER	_____
MANHOLE LOC	_____
6" PORT LOC	_____
WATERTIGHT TEST	_____

PRE-CONSTRUCTION 6/13/07 and 6/25/07 Shallow depth to bedrock encountered during testing. Homeowner has to produce

INSTALLATION plans for shallow system with aeration. (BB) 6/29/07 Visited site with Barry Slotfelty from MDE. We were able to find enough room to fit a bed on contour in the middle of the wooded area. (BB) 12/4/07 Fogles at site and ready to start on bed and aeration unit. Found out that Fogles had not dug up drywell and that it was only about 2/3 full. Trench off of drywell had not been used. (BB) 12/5/07 Homeowner opted

FINAL INSPECTOR B. Baker DATE OF APPROVAL 12/5/07

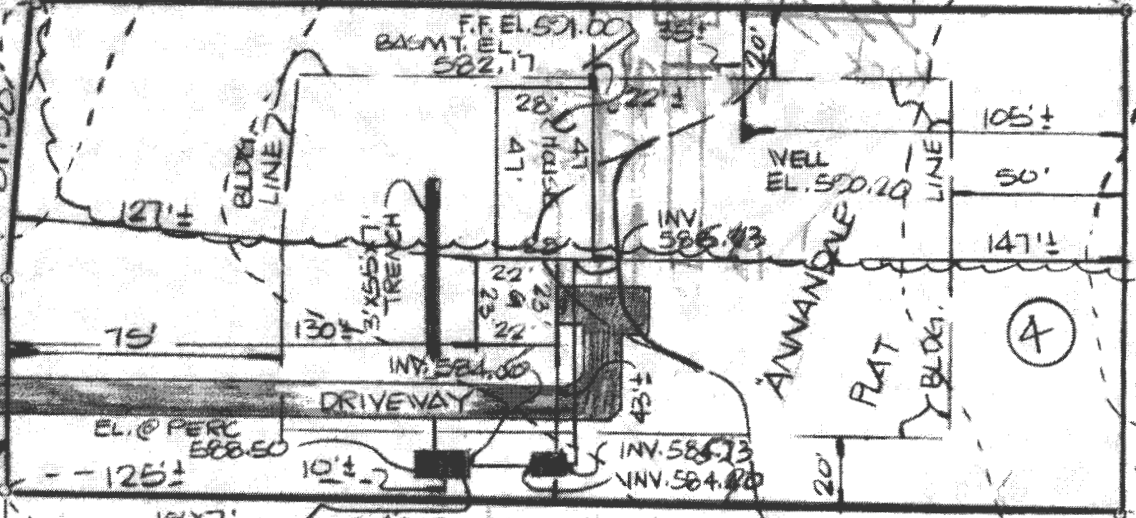
to keep drywell and trench. Fogles put in new pipe to drywell and to trench. Plans are available for future repair. (BB)

MARYLAND ROUTE #970

N11°28'21"E 81.38'

588 ONE 584°13'02"E

592 3704



FRED JAMES PIPES 707/460

SECTION 1

(15)

Just change to Elevation Septic Aug 22/77

HOUSE: 4 BEDROOM 2 1/2 STY.

OK 8/22/77

SCALE 1"=50'

PLOT PLAN LOT 4 SECTION ONE ANNANDALE

Handwritten notes and signatures at the bottom of the plot plan.



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

July 25, 2007

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

RE: Lewis Property
1711 Underwood Road

Dear Mr. Nixon:

I have reviewed the site evaluation data from your file and further evaluated the site with Brian Baker of your office. The results of our site evaluation at the referenced property indicate the site is suitable for the installation of an alternative shallow bed sewage disposal system with advanced pretreatment. The property may also be suitable for a modified sand mound with drip irrigation and advanced pretreatment, a drip irrigation system with advanced pretreatment or an alternative at-grade mound system. However, because of limitations on available area, and the property owner's desire to preserve mature trees on the property, the shallow bed with pretreatment may be the best option for the property. The property owner may wish to contact private consultants if they feel that other options for this property can be 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 wastewater treatment plants, fabric biofilters, single pass and recirculating sand filters, peat filters, composting toilets, and greywater re-use systems. The property owner's consultant may have preferences for a pretreatment unit to complement the soil absorption system selected. Information on pretreatment units eligible for funding from the Bay Restoration Fund (BRF) is available on MDE's website – www.mde.state.md.us. An application for grant funding of the pretreatment unit is also available on MDE's website. I am available to provide further guidance as to how pretreatment options could be incorporated into a system design if requested by you, the property owner, or their consultant.



Letter to: Mr. Bert Nixon
Re: Hobbs Property
Page Two

Soil Absorption Component

Based on the testing of your staff a 0.6 gpd/sq.ft. loading rate is recommended for the bottom area of the bed. The gravel bed should be constructed to a depth not to exceed 12 inches. In order to maintain a minimum of six inches of gravel beneath the distribution system, some fill cap may be needed. If a pump is required to convey treated effluent to the absorption bed, a pressure distribution network should be designed.

Plans and Specifications

A private consultant should be retained by the property owner to provide final plans and specifications for the system utilizing the design parameters contained here-in. Once plans are complete, two sets of plans must be submitted to the Onsite Systems Division of the Wastewater Permits Program and to the local Approving Authority for review before final approval to construct the system can be given

Agreement and Easement

An Agreement and Easement must be signed by all parties, recorded in the land records and returned to the local Approving Authority before permits to construct can be issued. The Agreement and Easement establishes the regulatory conditions associated with the experimental project and provides monitoring access for State and County personnel.

Linked Deposit

Financial assistance may be available for this project through the Department of the Environment's Linked Deposit Program. Information concerning this loan program can be found by entering linked deposit in the search box on the MDE website at www.mde.state.md.us. The Bay Restoration Fund may also provide assistance for a pretreatment unit that reduces nitrogen.

A copy of the site evaluation data is enclosed. Please forward a copy of this letter and attachments to the property owner. For questions about this matter please call me at (410) 537-4156.

Sincerely,



Barry Glotfelty, R.S.
Onsite Systems Division
Wastewater Permits Program

Attachments

cc: Mr. Eric Dougherty



MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Boulevard • Baltimore MD 21230
410-537-3000 • 1-800-633-6101

Martin O'Malley
Governor

Shari T. Wilson
Secretary

Anthony G. Brown
Lieutenant Governor

Robert M. Summers, Ph.D.
Deputy Secretary

September 6, 2007

Jerry Lewis
1711 Underwood Road
Sykesville, MD 21784

RE: Tax Map 9, Block 21, Parcel 300, Lot 4

Dear Mr. Lewis:

Your bid package for the Bay Restoration Fund (BRF) Onsite Sewage Disposal System (OSDS) Program has been approved for the use of funds totaling not more than \$14,875. The accepted bid amount is for the installation of a HOOT 600 BNR for your property located at 1711 Underwood Road, Sykesville, MD and shown on Tax Map 9, Parcel 300, Lot 4. You may choose to deviate from the selected unit, however the grant award for acceptable reimbursable expenses may not exceed \$14,875. All grants awarded through the Maryland Department of the Environment (MDE) are reimbursable. This means that all work done prior to this letter cannot be considered for reimbursement. In order to be eligible for reimbursement you must sign and record a copy in the land records of Howard County the Agreement and Easement for Installation of Best Available Technology Systems with Bay Restoration. You must provide MDE with the following:

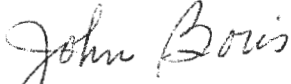
- The contractors' invoice. This invoice should include everything quoted in the bid. All expenditures greater than the bid amount will not be covered.
- A copy of the installation inspection performed by the Howard County Environmental Health program.
- A signed statement from the BAT Manufacturer that the unit was installed to their specific installation instructions.
- A signed statement that all work completed has met your satisfaction.
- A completed State Grant or Loan Payment Disbursement Request Form
- A copy of the Agreement and Easement for Installation of Best Available Technology Systems with Bay Restoration that shows that it has been recorded in the land records of Howard County.

All submitted documentation would be reviewed for compliance. Once all documentation is submitted, you will receive a payment directly from the State Comptroller's office.

Mr. Jerry Lewis
Page Two

The Maryland Department of the Environment thanks you for participating in this important program. If you have any further questions, please feel free to contact me at 410-537-3678 or 800-633-6101 ext 3678 or email at jboris@mde.state.md.us .

Sincerely,

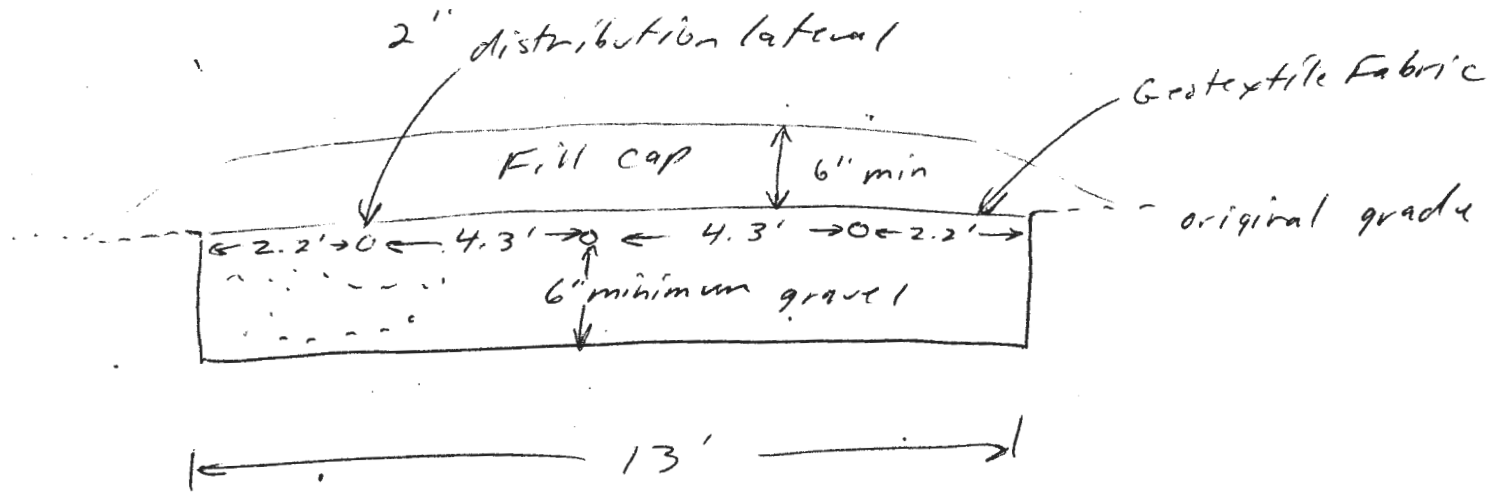


John A. Boris, Jr., R.S.
Bay Restoration Fund Project Manager

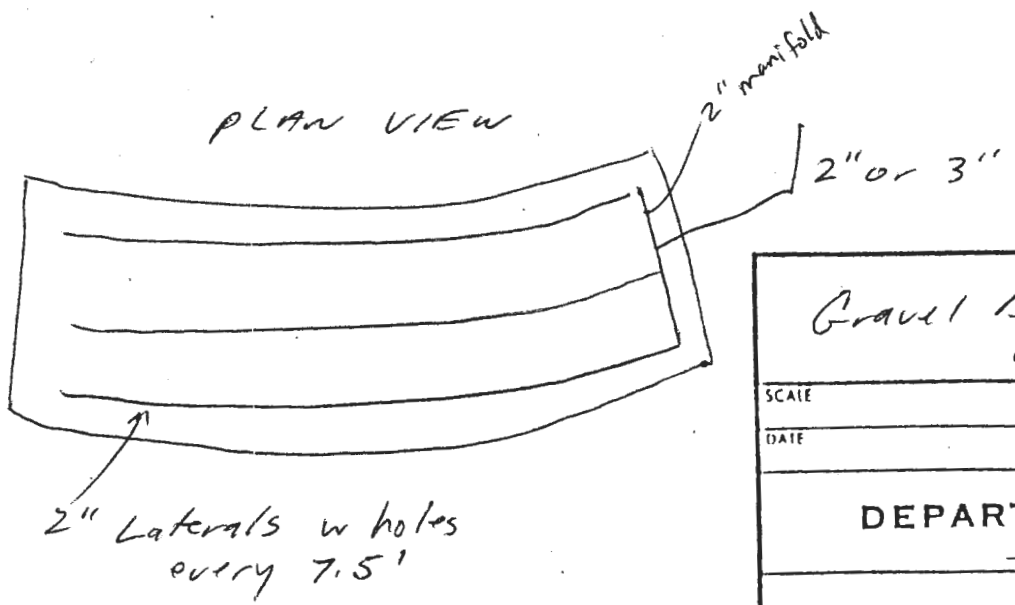
Enclosure

cc: Jay Prager
Howard County Health Department ✓
Jag Khuman, WQFA
Kurt Cassell, Fogle's Septic

CROSS SECTION



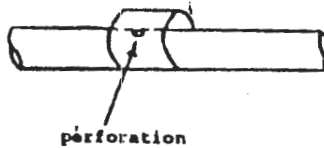
PLAN VIEW



Gravel Bed Cross Section & Plan Lewis Property			
SCALE	APPROVED BY:	DRAWN BY	
DATE		REVISED	
DEPARTMENT OF THE ENVIRONMENT			
BALTIMORE, MARYLAND 21201			
			DRAWING NUMBER

ALTERNATIVES FOR PLACEMENT OF THE END PERFORATION IN A DISTRIBUTION LATERAL

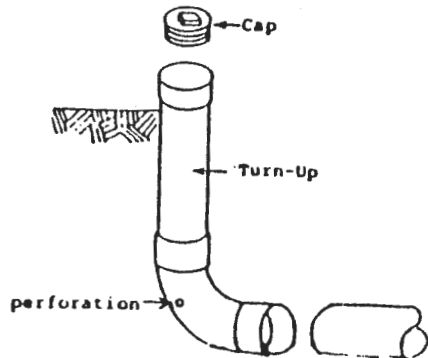
Shielded Placement



End Cap Placement



Turn-Up Placement



DISTRIBUTION SYSTEM NOTES

1. End or Center feed distribution system
2. Number of laterals = 3
3. Length of laterals = 70'
4. Diameter of laterals = 2"
5. Space between laterals = 4.3'
6. Space between lateral and bed's edge = 2.2'
7. Diameter of perforations = 5/16 in.
8. Space between perforations = 7.5'
9. Perforations per lateral = 10
10. Perforation discharge for 5/16 in. dia. perforation at 2ft. of head = 1.63 gpm
11. Lateral discharge rate = 16.3 gpm
12. Total discharge rate = 49 gpm
13. A pump must be selected that can deliver 49 gpm at _____ head
14. Dose = _____
15. Diameter of force main = 2 or 3"
16. Diameter of manifold = N/A

PRESSURE DISTRIBUTION SYSTEM

SCALE Not to Scale

DATE Jerry Lewis

DRAWN BY

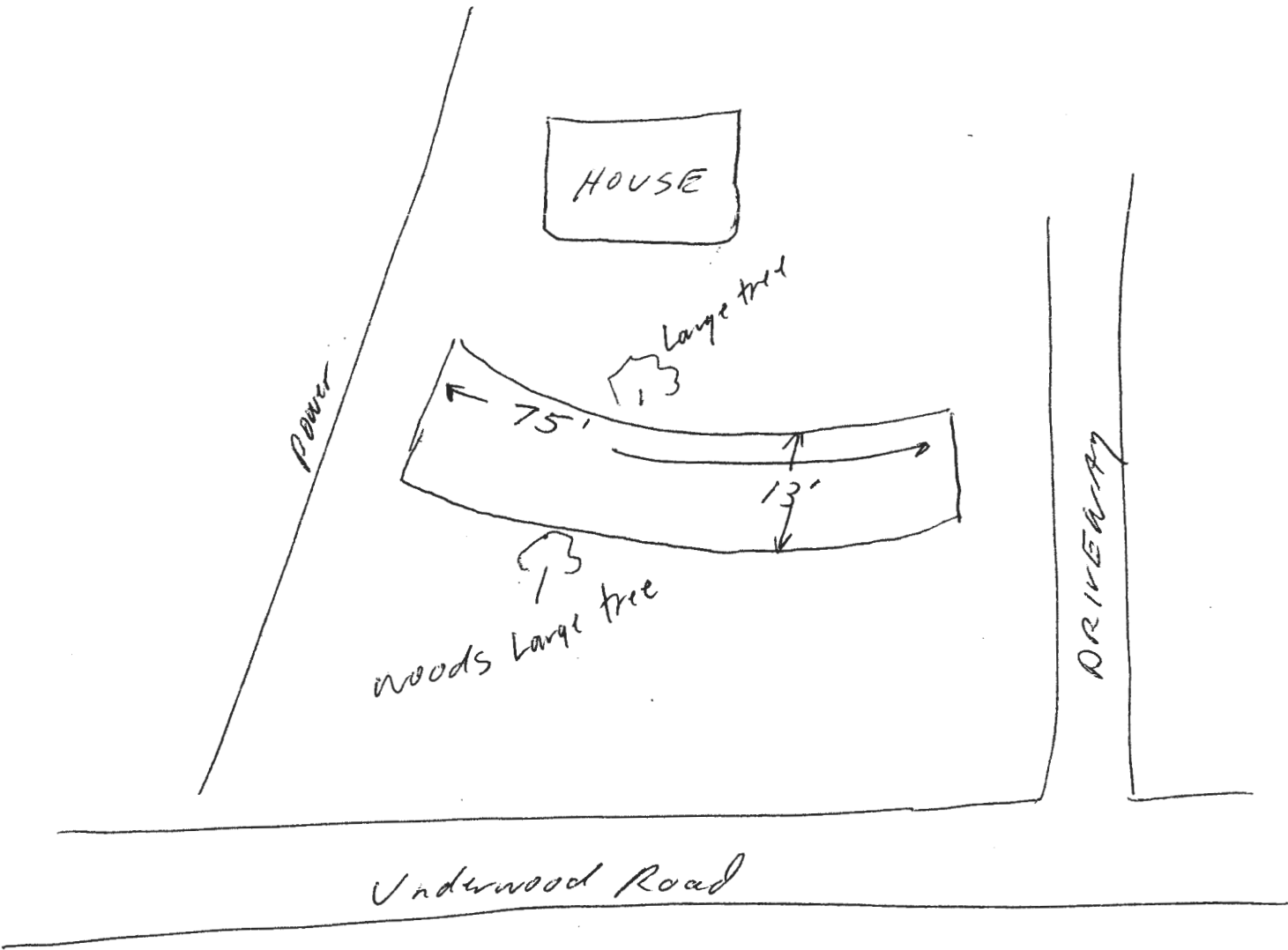
REVISED

DEPARTMENT OF THE ENVIRONMENT

DRAWING NUMBER

S I T E S K E T C H

NORTH



NAME: Jerry Lewis COUNTY: Howard DATE: _____

Note: Show the following items:

1. Property boundaries and dimensions.
2. Hand auger holes (AH), testpits (TP), boring (B) and tests (T).
3. Slope percent and direction.
4. Existing and proposed buildings, driveway, swimming pool, easements and right of ways on property.
5. Existing and proposed wells, septic systems, sewage disposal areas, ditches, water bodies and permanent stormwater control structures on property and within 150 feet of property lines.

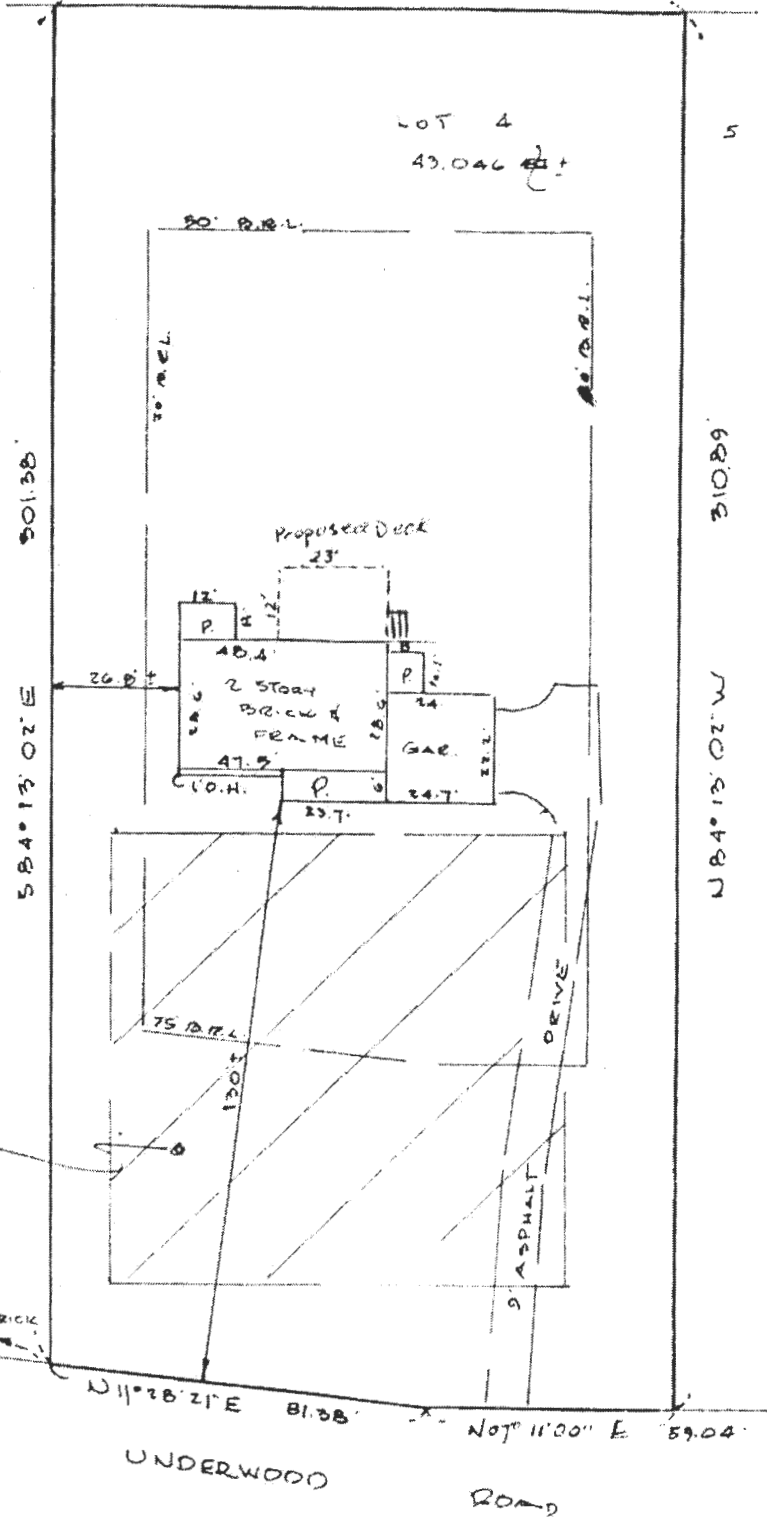
Property known as LOT 4
 SECTION ONE ANNANDALE
 PLAT # 504 3RD ELECTION DIST. HOWARD CO. MD
 # 1711 UNDERWOOD ROAD

THIS PLAT CAN NOT BE USED TO ESTABLISH PROPERTY
 LINES OR CORNERS.

505° 46' 58" W 140.00'

LOT 4
 43.046 ±

6-25-85
 PROPOSES ADDITION DOES
 NOT IMPACT ON SEPTIC
 SYSTEM OR RETRAVE AREA, OR
 WELL SITE AND LINE.
 NO EVIDENCE OF FAILURE.
 SATAN



Private
 Sewage
 Easement

To OLD FREDERICK
 ROAD

N 11° 28' 21" E 81.38'
 UNDERWOOD ROAD
 N 07° 11' 00" E 59.04'

HO-73-2237



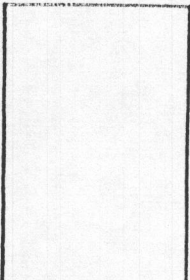
INNOVATIVE WASTEWATER TREATMENT SYSTEMS
 P.O. BOX 363, NEW WINDSOR, MD 21776
 (410) 875-9370 Office (410) 635-2883 Fax
 H. Dale Gray, Principal

INNOVA, LTD
WASTEWATER
DISPOSAL SYSTEM

Project Title: LEWIS PROPERTY

Address: 1711 UNDERWOOD ROAD SYKEVILLE, MD (HOWARD COUNTY) 21784

OK - Perry 11-6-07



10/18/2007

Note: Revision

Lewis Property
 1711 Underwood Road Sykesville MD

Page 10

Please replace indicated perforated end caps with drilled elbow/turn up

LEWIS PROPERTY
1711 UNDERWOOD ROAD
SYKESVILLE, MARYLAND 21784

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<u>SHEET</u>	<u>DESCRIPTION</u>
1	WASTEWATER SYSTEM, PLAN VIEW (SCALE 1":20')
2	WASTEWATER SYSTEM, PROFILE VIEW (SCALE, HORIZONTAL: 1" =10', VERTICAL: 1" = 2')
3	OVERVIEW / DISCUSSION
4	DISTRIBUTION SYSTEM / PUMP SELECTION AND PUMP CURVES
5	DISPOSAL FIELD PLAN AND PROFILE VIEW
6	SYSTEM ELEVATIONS / DRAWING WASTEWATER PRETREATMENT UNIT CONTAINMENT TANK
7	DRAWING OF WASTEWATER PRETREATMENT UNIT [HOOT H-600A]
8	PUMP CHAMBER / FLOAT SETTINGS AND INSTALLATION NOTES
9	SIMPLEX CONTROL PANEL (NEMA 4X) [230 V, single phase/control panel / 3 float switches] & INSTALLATION NOTES
10	DISTRIBUTION PIPING / DRILLING MENU 5/16" PERFORATIONS
11	CONSTRUCTION PROCEDURES (ADAPTED TO SHALLOW IN-GROUND DISPOSAL BED)

OCTOBER 18, 2007

WELL

100'

Tanks Cannot Go Here
> 100' From Neighbor's
Well

(BLOWER) CONTROL PANEL
PUMP CONTROL PANEL

COMMON TRENCH -
Electrical conduit

PUMP TANK

1500 GAL. (Top Se

Aerator Pump

Hoot H-600 A

TREATMENT UN

DECK

4" PVC SH 40

102.4' R

(EXIT)

± 102(R)

(Top Seam)
Custom Containment Tank

1711
LINDERWOOD ROAD

TURN
97.5'

OLD
DRY WELL
(OFF LINE)

2 1/2" PVC SH 40 FORCE MAIN (165')

101.1(R)

102.9(R)

*100.6(R)

101.2(R)

A

101(R)

*100.95(R)

2 1/2" PVC SH 40 MANIFOLD

100(R)

SHALLOW IN-GROUND DISPOSAL SYSTEM BED

XG

B

C

Project J. LEWIS PROPERTY
1711 UNDERWOOD R
Sykesville MD 21776

Sheet Title:
WASTEWATER
SYSTEM
PLAN

DRAWING

WWT-1
1 of 1 Sheet

TESTS SHALLOW IN-GROUND 12" (MIN. 4' UNSATURATED

CONVENTIONAL OR DEEP TRENCH

DEPTH

- A - FAILED GROUND WATER 13'
- B - FAILED >50% ROCK @ 3.5'
- C - FAILED >50% ROCK @ 5'
- D - FAILED >50% ROCK @ 7'
- E - FAILED >50% ROCK @ 6'
- F - FAILED >50% ROCK @ 7'
- G NOT EXCAVATED

- AAA
- NNN
- @ 36" 77 MIN /INCH
- @ 18" 48 MIN /INCH
- @ 24" 8 MIN /INCH

ADEQUATE
ADEQUATE
ADEQUATE

UNDERGROUND
UTILITY CABLE

UNDERWOOD RD.

te: 10/18/07

ale: 1" = 20'



INNOVA, LTD

INNOVATIVE WASTEWATER TREATMENT SYSTEMS

P.O. BOX 363, NEW WINDSOR, MD 21776

(410) 875-9370. Office

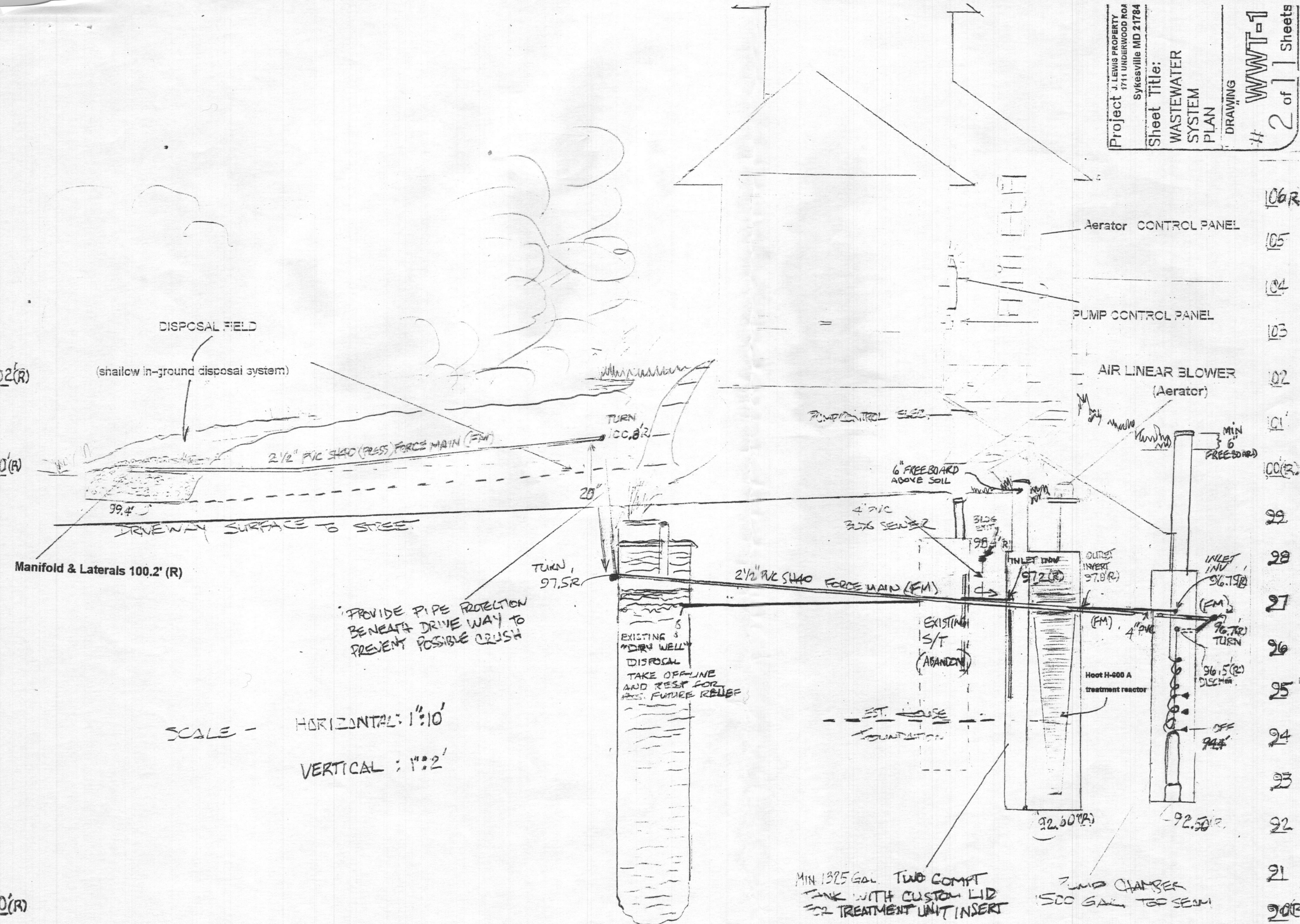
(410) 635-2883 Fax

H. Dale Gray, Principal

Project: J. LEWIS PROPERTY
 1711 UNDERWOOD ROA
 Sykesville MD 21784

Sheet Title:
 WASTEWATER
 SYSTEM
 PLAN

DRAWING
 # WWT-1
 2 of 11 Sheets



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 P.O. BOX 363, NEW WINDSOR, MD 21776
 (410) 875-9370 Office
 (410) 635-2883 Fax
 H. Dale Gray, Principal

Date: 10/18/07
 Scale: 1" = 10'-0"
 AS SHOWN

LEWIS PROPERTY
1711 UNDERWOOD ROAD
SYKESVILLE, MD 21784

OVERVIEW / DISCUSSION

OVERVIEW

A dry well, soil disposal pit has been serving the property's 30+ year old, four bedroom home since the home was constructed. Recently, it has become evident that the dry well has failed, causing the owner to periodically pump the dry well and septic tank to avoid wastewater breakout. The home, fronting on Underwood Road, is located on a 1.3 acre lot, gently sloping [1 - 2.5%] from rear boundary to Underwood Road.

Representatives of Howard County's Bureau of Environmental Health (HCBEH), the approving authority, and the Maryland Department of the Environment [MDE] Area Sanitarian evaluated site soil infiltration rates ["perc" testing], and soils capability observations (soil profiles). Based on the observations, and test results requirements for a new wastewater system were stipulated by HCBEH as necessary for a wastewater disposal system approval:

PRETREATMENT [CONTAMINANT REDUCTION] OF SITE WASTEWATER
is needed due to reduced water disposal characteristics of the soil, and limited amount of useable disposal area available on the site. Just as important, a need to protect, and extend the use-life of the area/soil that is available.

USE OF A NON-CONVENTIONAL SOIL DISPOSAL SYSTEM
referring to observed conditions of soil depth, and structure, conventional trench disposal was considered not feasible. It is necessary to satisfy the MD State standard four (4') foot depth of continually dry (unsaturated), non-rock laden soil below the point of proposed wastewater introduction. The requirement is satisfied using a shallow in-ground gravel disposal bed (12" depth - unsaturated soil depth 4+ feet), dosed by low pressure application of treated wastewater (effluent) over the bed [of all tests observed, Test Pit "E" with a rock limitation beginning at a 6' depth was the most limiting (shallow) depth observation in the Disposal Area].

DISCUSSION

Site testing and evaluation located useable soil disposal in front of the home, in a wooded area. Vegetation understorey in the area is moderately open, and clear except, along the edges. The bed structure describes a gentle bow-like curvature along contour. The designated disposal bed reaches 75' across the lot (along contour) with a width of 13', and extends between two large trees near the bed center. The area, as indicated is generally open except for two, possibly three small trees (6" dia.) that may need to be cut off at ground level.

The owner hopes to protect the large trees from harm (root damage/suffocation) caused by excavation and excessive soil depth burial of root systems during disposal bed construction and soil cap grading. The problem can be reduced substantially by not burying that part of the native soil surface (with cap grading soil), adjacent to the tree trunks. When excavating the disposal bed between the large trees, hand excavation should be employed to reduce major root system damage by not severing root runners.

The original septic tank, assumed to be a 1250 gallon, mid-seam tank (commonly used in the 1970's) must be pumped/cleaned to HCBEH standards, and rendered no longer useable, and safe. A new, custom built, top seam tank (min size 1325 gal.) will receive building sewer discharge in the trash/grit interceptor (400 gallon) compartment passing sewage (influent) to the 920 gallon (min.) compartment for treatment by means of a 1 foot Aerobic Systems, Inc. aeration treatment unit. At estimated wastewater strength of 220 mg/L BOD₅ (organic contamination), and average daily flow of 300 gallons the BOD₅ discharge is anticipated to be less than 10 mg/l and Total Nitrogen reduced about 70%, from an estimated 40 mg/L to about 12 mg/L. Based on reduced levels of organic contamination and even distribution of the treated wastewater across the Bed, the system is designed to maximize the useful life of the disposal area.

The original, now failed, Dry Well Disposal Pit should be put into a rest condition, but not abandoned. The Dry Well pit is considered the property's alternative (future) disposal application, to be used in the event that this shallow in-ground disposal bed fails. Introduction (future) of treated wastewater to the Dry Well would be a positive, renovating factor, but re-use of the Dry Well, in the future would require HCBEH approval before reconnecting to that system.

* revision 10/18/2007

Project	J. LEWIS PROPERTY 1711 UNDERWOOD ROAD Sykesville MD 21784
Sheet Title:	WASTEWATER SYSTEM PLAN
DRAWING	
#	WWT-1
	3 of 1 Sheets



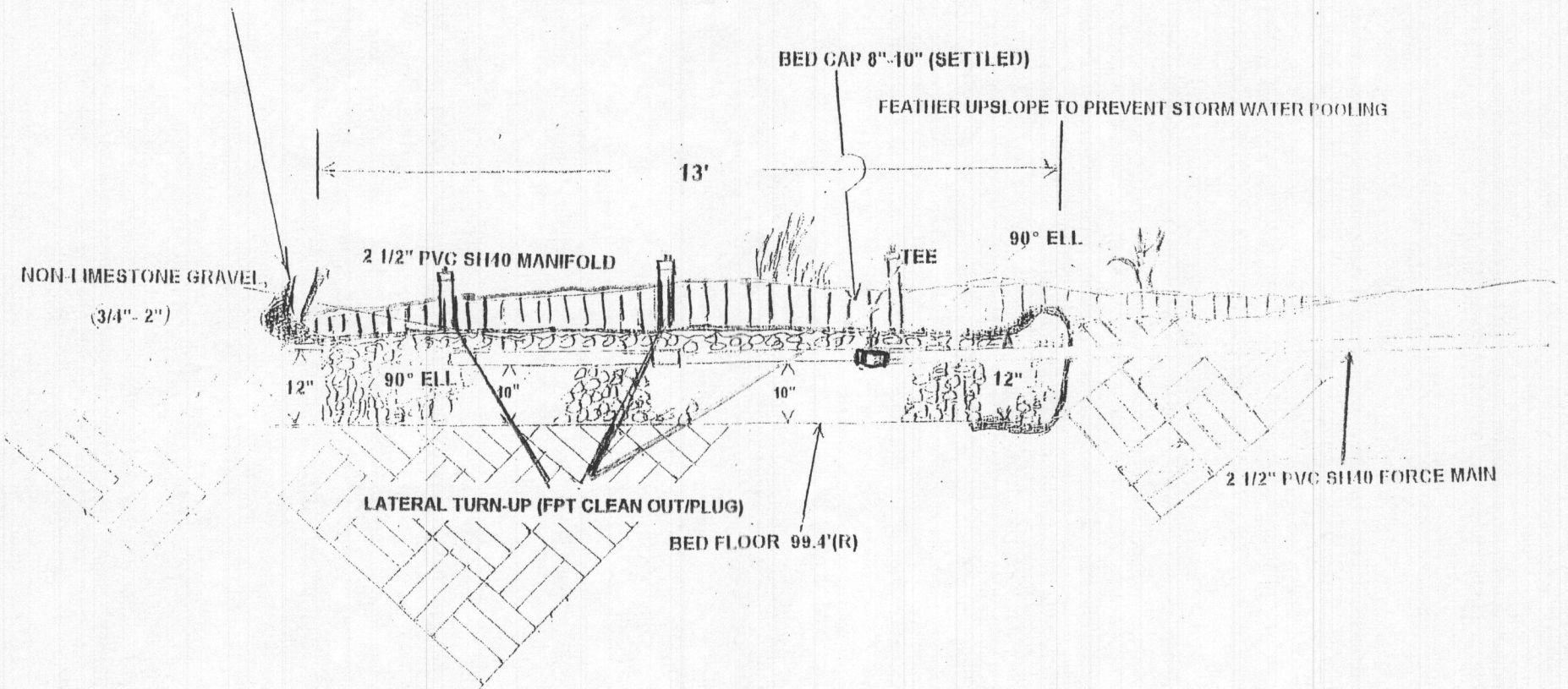
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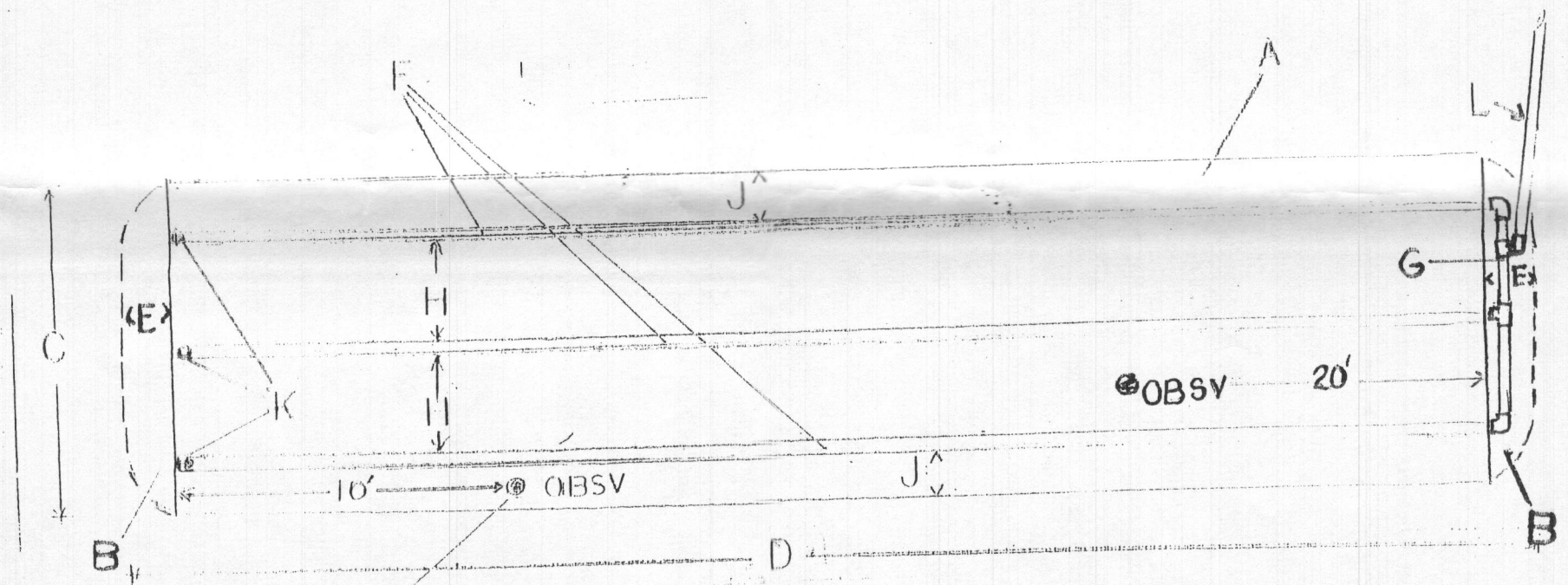
(410) 635-2883 Fax
H. Dale Gray, Principal

date: 10/18/07
scale: 1" = NA

SPUN GEOTEXTILE FABRIC (BED COVER)
 SECURE FABRIC BY PLACING AN 18" FLAP ON FLOOR OF BED ALONG UPSLOPE SIDE AND ANCHOR BY
 PLACING THE STONE IN THE BED - FOLD AND COVER ENTIRE BED BEFORE PLACING TOPSOIL CAP COVER.
 SECURELY STAKE THE FABRIC ON THE DOWN SLOPE SIDE OF BED BEFORE FINISH GRADING

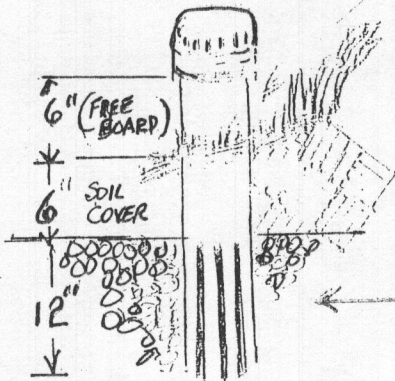


END VIEW PROFILE
 SHALLOW IN-GROUND ABSORPTION BED
 SCALE AS SHOWN



SCALE AS SHOWN

- A Absorption Bed 13'W X 75' L
 - B Piping Support Pad 13' W X 2.5' L
 - C Bed Width 13'
 - D Bed Length 75'
 - E Bed End pipe set back 2.5'
 - F 2" PVC, Lateral [Sh 40- press.] length 70'
 - G 2 1/2" PVC Manifold (end feed) 8' 8"
 - H Lateral separation 4' 4"
 - J Bed Side set back 2' 2"
 - K Lateral pipe turn up
 - L 2 1/2" PVC Force Main [Sh 40- press.]
- OBSV 4" PVC capped observation pipe (slotted base)(2)



PLAN VIEW
 SHALLOW IN-GROUND ABSORPTION BED

Project	J. LEWIS PROPERTY 1711 UNDERWOOD RD Sykesville MD 21781
Sheet Title:	WASTEWATER SYSTEM PLAN
DRAWING	
#	WWT-1 5 of 1 Sheet

Site: 10/8/07
 Scale: AS SHOWN
 1" = SHOWN



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 INNOVATIVE WASTEWATER TREATMENT SYSTEMS

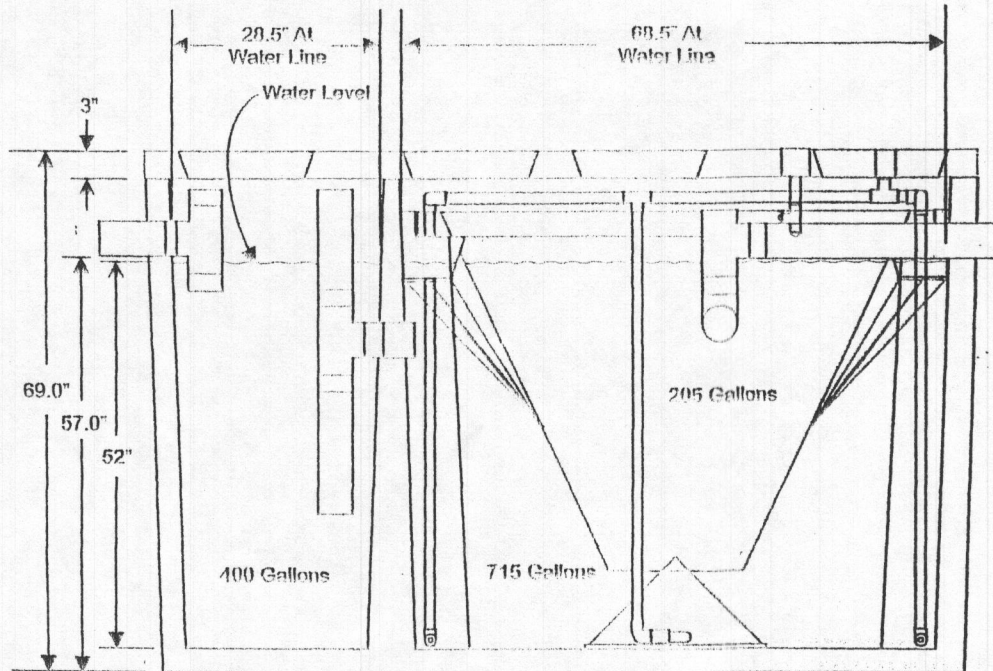
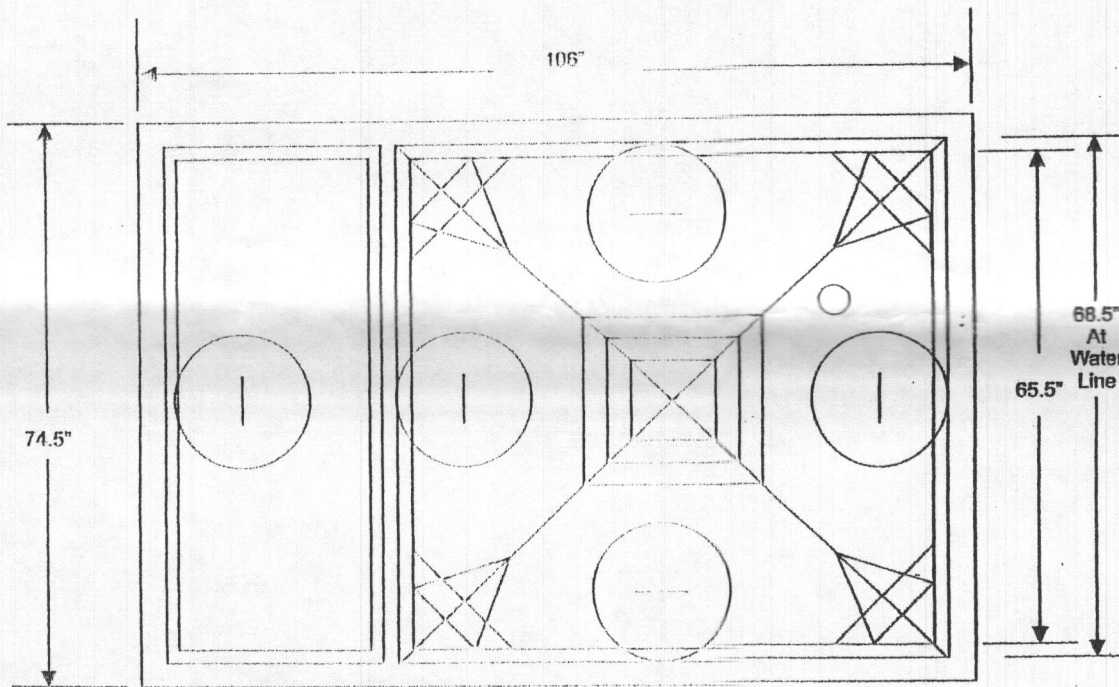
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 H. Dale Gray, Principal

LEWIS PROPERTY
 1711 UNDERWOOD ROAD
 SYKESVILLE, MD 21784

SYSTEM ELEVATIONS [Bench - driveway edge @ existing Septic Tank = 100'R]

	Native Surface	System Element
Building Sewer Exit	102.4' R	Pipe- 98.4' R
OLD Septic Tank Inlet	100.0'R	Pipe(invert) 97.0' R
NEW SYSTEM		
Septic/Treatment Tank	100' R	Top 98.25' R
		Inlet Inv 97.25' R
		Outlet Inv 97.0' R
		Floor 92.87' R
		Base 92.5' R
Pump Chamber (Tank)	99.7' R	Top 98.72' R
		Inlet 96.75' R
		Discharge 96.50' R
2 1/2" Force Main		Turn 96.50' R
		Turn 96.74' R
		Turn 97.5' R
		Turn 100.8' R
Bed [12" gravel depth, max.]		Floor 99.4' R
2 1/2" PVC Distribution Manifold		Pipe 100.2' R
2" PVC Lateral(s)		Pipe 100.2' R
Bed Top (surface)		Gravel 100.4' R
Soil Cap [8"-10", unconsolidated]		Soil 101.2' R

**600 GPD GRAVITY DISCHARGE SYSTEM
 H-600 A**



2.229' Avg. Length
 5.600' Avg. Width
 4.333' Depth

Project J. LEWIS PROPERTY
 1711 UNDERWOOD ROAD
 Sykesville MD 21784
 Sheet Title:
**WASTEWATER
 SYSTEM
 PLAN**
 DRAWING
 # WWT-1
 6 of 11 Sheet

10/18/07

AS SHOWN



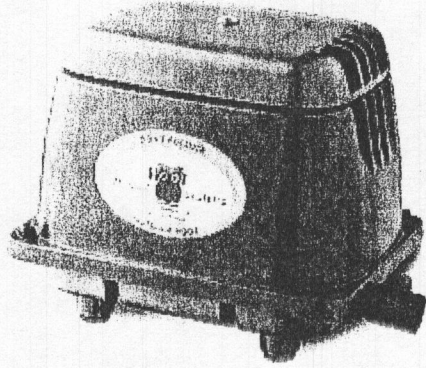
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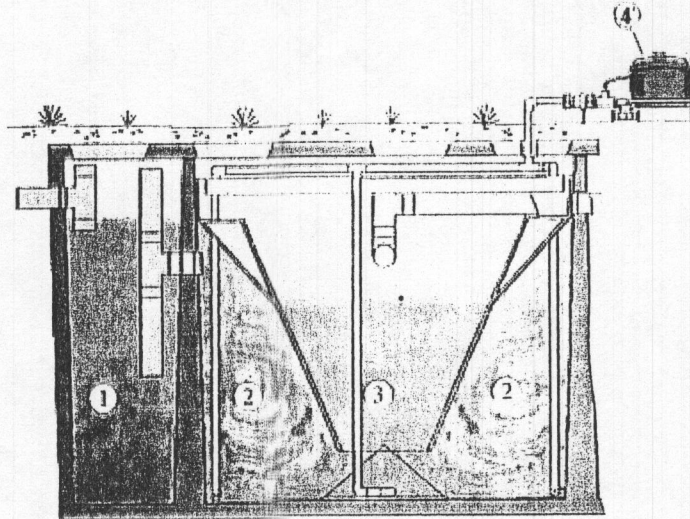
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 H. Dale Gray, Principal



THE TROY AIR BLOWER

Oxygen, key to the Aerobic Treatment Process, is supplied by the Troy Air Linear Blower, a very quiet, energy efficient linear air pump.

It is so quiet; most people standing next to it find it difficult to hear! It uses less electricity than a 150 watt light bulb and less than 1/3 the electricity required by louder carbon vane pumps saving you hundreds of dollars per year over the competition.



Hoot Aerobic System

H 600 A

600 GPD GRAVITY DISCHARGE SYSTEM

- 1 Pretreatment (trash collection chamber) chamber, receives sewage from house and passes this effluent to the aeration chamber.
- 2 Aeration Chamber, oxygen pumped into wastewater
- 3 Clarifier Chamber where clear odorless effluent rises and is discharged to the Pump Tank
- 4 Linear Air Blower 115 V 30 AMP BLOWER MAY BE LOCATED WITHIN 50' OF TREATMENT UNIT

Project	J. LEWIS PROPERTY 1711 UNDERWOOD ROAD Sykesville MD 21784
Sheet Title:	WASTEWATER SYSTEM PLAN
DRAWING	
#	WWT-1 7 of 11 Sheets

10/12/07



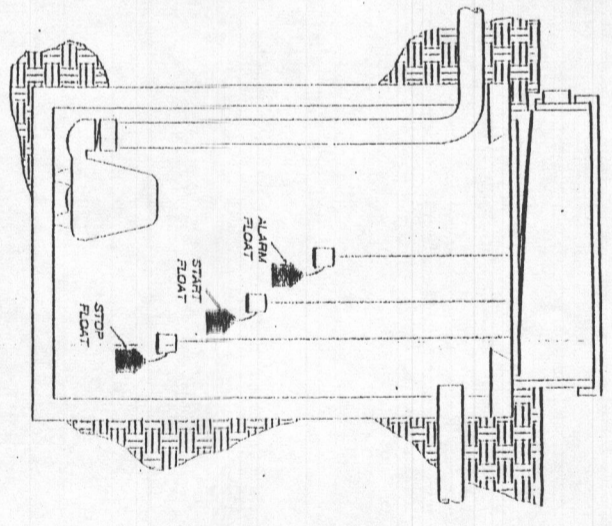
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Thomibus
TECHNOLOGY

INSTALLATION INSTRUCTIONS - PAGE 2
Control switches with external weights

Figure 1 - Three Float Installation



MANUAL TESTING To simulate simplex operation sequence.

For ease of installation and safety reasons, we recommend manual testing of float switch operation prior to attaching floats to discharge pipe in the pump chamber.

1. Make sure all float switches are in off position. SEE FIGURE 2.
2. Turn on power source. The control panel control switch should be on and the H/OA switch should be in automatic position.
3. Tip stop float to on position.
4. While stop float remains tipped, the start float to on position. At this point the pump and pump run light will turn on.
5. Return start float to off position. Return stop float to off position. Pump and pump run indicator light will now be off.
6. To test alarm operation, the alarm float to on position. The red light and horn should be activated.

NOTE: UNIT SHOULD BE PERIODICALLY TESTED TO INSURE PROPER OPERATION.

Mounting Control Switches

CAUTION: Do not begin installation in pump chamber until all power source circuit breakers have been turned off. For added safety, also turn off the control switch and the H/OA switch. Failure to turn off power could result in serious or fatal electrical shock.

- Cable Weight (Figure 2)**
1. Lay cable in weight channel.
 2. Align clip with weight groove and slide towards cable.
 3. Snap clip snugly up to cable, manually moving clip to the tightest possible position.
 4. Wire cable leads directly into control device.
 5. Suspend unit at desired activation level. See Figure

Float Switch Specifications:
Sensor Float Control switch. HOUSING: 3.36 in. (6.56 cm), diameter x 4.55 in. (11.56 cm), long, high impact resistant, non-corrosive PVC plastic for use in liquids up to 140° F (60°C). CASE: 5.16 gauge, 2 conductor SJOW-4 (UL), SJOW(W/OSA) water resistant; Neoprene.

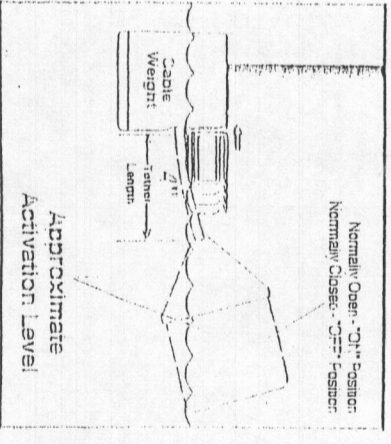
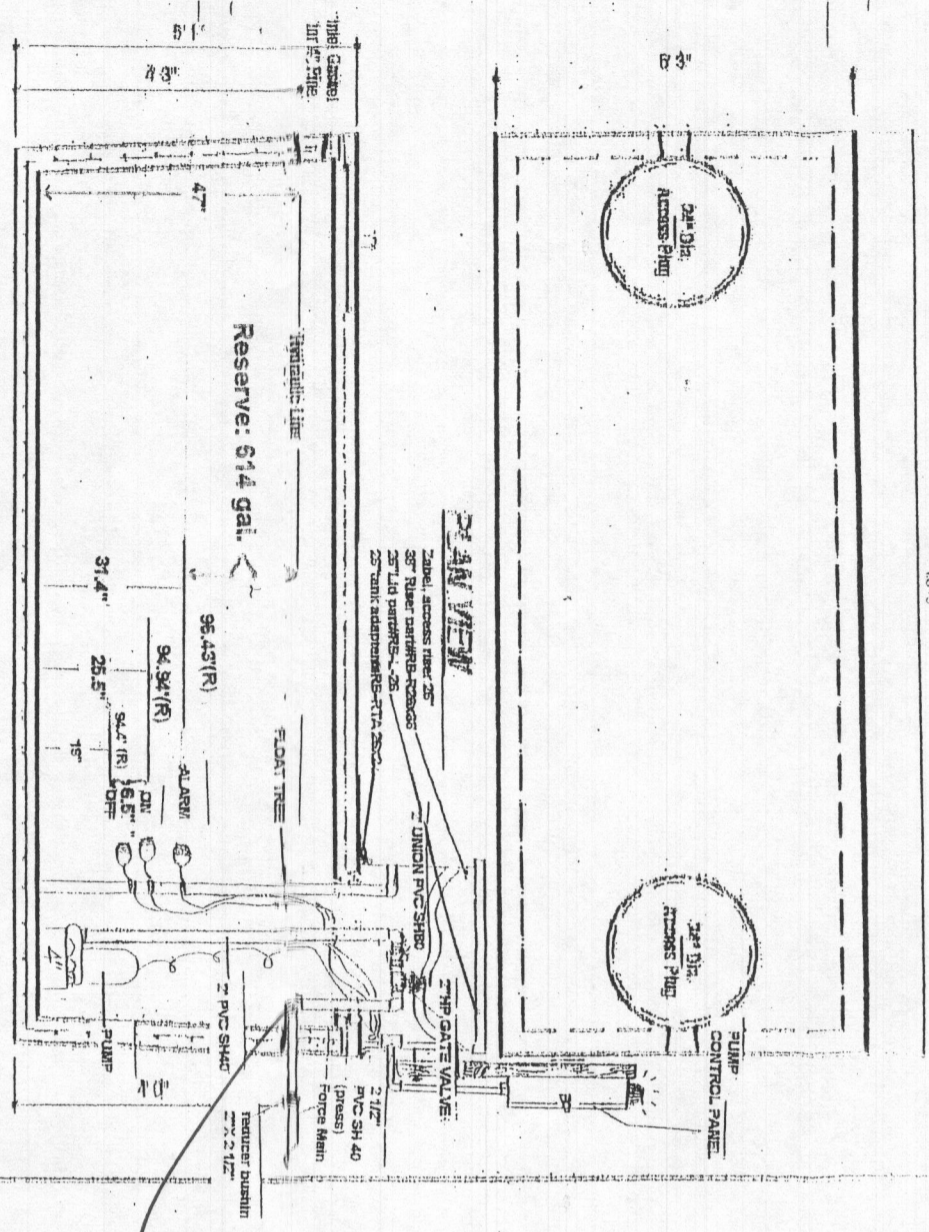


Figure 2

Float installation shown is for a high level (pump down) system. To install a low level (pump up) system, stop float should be mounted at upper level, and a start float mounted at lower level. Start float remains as shown above. Wire connections to terminal strip are the same for a high or low level system.

Handwritten note: Need 1/4" 5/16" or weep hole here.

SECTION A-A



DESIGN DATA & GENERAL NOTES

1. Concrete strength to be 4,000 p.s.i. @ 28 days. Density - 150 p.c.f.
2. Cement - Portland type III per ASTM C 150-65
3. Admixtures & Disinfectants per ASTM C 231-65 & AWWA C 200
4. Reinforcing per ASTM A 618, Min. 1.00 in. spac.
5. For steel rebar with epoxy type mortar.
6. For wall, base, & top thickness.

MWB
Meyer Bros., Inc.
2500 Perry Road
P.O. Box 21075
St. Louis, MO 63121
Tel. 314-792-5483
Fax 314-792-1522

1,500 GALLON SETPOINT PUMP TANK
1-COMPARTMENT
NON-TANKED MAX SIZE OF COVER
DWG. NO. 150B-1C Net Scale
DATE 1, 2000

4" depth = 33.4 gal.

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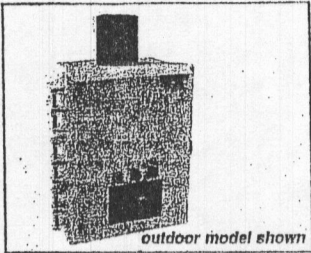
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112IW104H + OPTIONS 8A, 8C, 10E

MODEL 112 control panels

Single-phase, simplex motor contactor control.

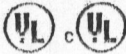


APPLICATIONS

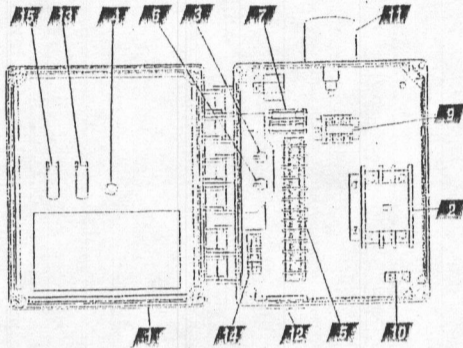
The Model 112 control panel provides residential and commercial customers with a reliable means of controlling one 120, 208, or 230 VAC single-phase pump in water and sewage installations. Two control switches activate a magnetic motor contactor to turn the pump on and off. If an alarm condition occurs, an additional alarm switch activates the audio/visual alarm system. Common applications include pump chambers, sump pump basins, irrigation systems, and lift stations.

FEATURES

- Entire control system (panel and switches) is UL Labeled to meet and/or exceed industry safety standards
 - Dual safety certification for the United States and Canada
 - Package includes float switches (optional)
 - Complete, step-by-step installation instructions included
 - Two-year limited warranty
- 1 Enclosure measures 10 x 8 x 4 inches (25.4 x 20.32 x 10.16 cm) with removable mounting flanges. Choice of NEMA 1 (engineered thermoplastic for indoor use), or NEMA 4X (ultraviolet stabilized thermoplastic for outdoor use).
 - 2 Magnetic Motor Contactor controls pump by switching both electrical lines
 - 3 HOA Switch for manual pump control
 - 4 Green Pump Run Indicator Light
 - 5 Float Switch Terminal Block
 - 6 Control ON/OFF Switch
 - 7 Control and Alarm Fuses
 - 8 Circuit Breaker (optional) provides pump disconnect (not shown)
 - 9 Input Power Terminal Block
 - 10 Ground Lug



Model Shown 112IW114X



ALARM PACKAGE (OPTIONAL)

- RT** Red Alarm Beacon provides 360° visual check of alarm condition
- RT** Alarm Horn provides audio warning of alarm condition (83 to 85 decibel rating)
- RT** Exterior Horn Silence Switch allows alarm horn to be silenced
- RT** Horn Silence Relay automatically resets alarm after alarm condition has been resolved
- RT** Exterior Alarm Test Switch allows for testing of horn and light to



TYPE 112 INSTALLATION INSTRUCTIONS Single Phase Simplex Control Panel

CAUTION:

Rhombus cannot be responsible for damages caused by the faulty or negligent installation of this control. We recommend that you engage the services of a competent plumber, electrician or qualified service person to install this product in accordance with the national and local electrical codes.

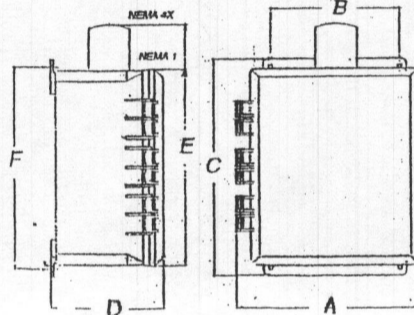
All conduit routing from the sump or tank to the control panel must be sealed with conduit sealant to prevent moisture or gases from entering the panel. Nema 1 enclosures are for indoor use primarily to provide a degree of protection against contact with enclosed equipment. Cable connectors are not required to be liquid tight in Nema 1 enclosures. Do not use Nema 1 enclosures if subjected to rain, splashing water, or hose directed water. Nema 4X enclosures are for indoor or outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose directed water. Cable connectors must be liquid tight in Nema 4X enclosures.

MOUNTING AND WIRING CONTROL PANEL

1. Determine mounting locations for control panels. If distance exceeds the length of either the float switch cables or the pump power cables, splicing will be required. For outdoor or wet installation we recommend the use of a junction box with liquid tight connectors (S.J. Electro System's Model JB70) to make required connections. (When using conduit refer to enclosed conduit connector sheet, and be sure to use conduit sealant to prevent moisture or gases from entering the panel.)
2. On the control panel, determine the "power in" location (from the building power supply). Check local codes and schematic for power circuit requirements.

CAUTION: BE SURE THE POWER SUPPLY VOLTAGE AND PHASE ARE THE SAME AS THE PUMP MOTORS BEING INSTALLED. IF IN DOUBT, SEE THE PUMP IDENTIFICATION PLATE FOR VOLTAGE/PHASE REQUIREMENTS.
3. On the control panel, determine the location of the pump power cables, and the float switch cables.
4. Drill proper size holes for connection to panel.

CAUTION: IF USING CONDUIT, BE SURE THAT THE CONDUIT BEING USED IS OF ADEQUATE SIZE TO PULL THE PUMP AND SWITCH CABLES THROUGH. RECOMMENDED MINIMUM 1/4" FOR SIMPLEX APPLICATIONS.
5. Mount control panel (mounting devices are furnished with control panel).
 - a. NEMA 4X mounting flange kit included in the box.
 - b. NEMA 1 mounting feet are installed on enclosure, rotate feet to desired position.
6. Attach cable connectors and/or conduit connectors to control panel.



FOR INSTALLATION WITHOUT A SPLICE GO TO STEP 12. FOR INSTALLATIONS REQUIRING A SPLICE FOLLOW STEP 7 - 11.

- CAUTION: AT THIS POINT, TURN OFF ALL POWER SOURCES.**
7. Determine location for mounting junction box according to local code requirements. Do not mount the Junction Box inside the sump or basin.
 8. Run the conduit or connectors to junction box and drill the junction box as required to make the proper connections. Attach the conduit or connectors to the junction box.
 9. Mount junction box to proper support.
 10. Pull pump power cables and float switch cables through connectors into junction box. Identify and label each wire before pulling through conduit into control panel. Make necessary wire splice connections at junction box.
 11. Firmly tighten all fittings on junction box.
 12. If a junction box is not required, pull pump cables and float switch cables through connectors into control panel.
 13. Attach pump cables and float switch cables to the proper numbered terminals. SEE WIRING DIAGRAM INSIDE CONTROL PANEL.

CAUTION: IF FLOAT SWITCH CABLES ARE NOT WIRED IN THE PROPER ORDER, THE PUMP SYSTEM WILL NOT FUNCTION PROPERLY.

14. Connect "power in" conductors to proper terminals. (SEE WIRING DIAGRAM)

	NEMA 1	NEMA 4X
A	9 1/2"	9 1/8"
B	6 1/2"	6"
C	12 1/2"	11 3/4"
D	7 1/2"	7 1/4"
E	10 1/2"	13 1/2"
F	11 3/4"	10 3/4"

112 I W I O 4 H 8A 8C, 10E

MODEL 112

ALARM PACKAGE

- 0 = select options or no alarm package
- 1 = alarm package (includes test/normal/silence switch, fuse, red light, horn & float)

ENCLOSURE RATING

- I = Indoor, NEMA 1 (metal)
- W = Weather-proof, NEMA 4X (engineered thermoplastic)

STARTING DEVICE

- 1 = magnetic motor contactor 120/208/240V
- 9 = magnetic motor contactor 120V only

PUMP FULL LOAD AMPS

- 0 = 0-7 FLA
- 1 = 7-15 FLA
- 2 = 15-20 FLA
- 3 = 20-30 FLA

PUMP DISCONNECTS

- 0 = no pump disconnect
- 1 = pull-out with safety deadfront in a 10"x8" enclosure
- 4 = circuit breaker 120V (select STARTING DEVICE option 9 above) 120/208/240V (select STARTING DEVICE option 1 above)

FLOAT SWITCH APPLICATION

- I or L = pump down or pump up
- X = no floats

WITH alarm package
WITHOUT alarm package

OPTIONS Listed below

★ ENCLOSURE UP-SIZE - If you selected 3 or more of the ★ options, or one ★★ option, a one-time enclosure upsize fee would apply.

Additional features are required, call the factory for a quote on an Engineered Custom Control Panel.

<p>CODE DESCRIPTION</p> <ul style="list-style-type: none"> 1A Red beacon only / no audio (must select 1E if floats included) 1C Horn only / no visual (must select 1E if floats included) 1E Alarm float 3A Alarm flasher 3B Manual alarm reset 4A Low level cutoff (select option 4D if floats included) 4B Red low level indicator & alarm (must select 4A also) 4D Low-level float 5A Thermal cut-off/heat sensor auto reset (for pumps with thermal switch leads) 5E Seal failure circuit & red indicator (2 wire) 6A Auxiliary alarm contact, form C type 8A Elapsed time meter 8C Event (cycle) counter 8E A Pump overload (specify amperage after number 0 followed by letter "A". Example: 012A = 12 amp pump.) 10E Lockable latch - NEMA 4X 10F Lockable latch - NEMA 1 10G Lightning arrester 10K Anti condensation heater 	<p>CODE DESCRIPTION</p> <ul style="list-style-type: none"> 11C NEMA 1 alarm panel must select option 6A 11D NEMA 4X alarm panel must select option 6A 114B Main disconnect (rotary style, mounted through door) non-fused ★★ 0-20 FLA (total of both pumps) ★★ 20-30 FLA (total of both pumps) 15A Control / alarm circuit breaker (Does not include the circuit board as in standard.) 16A 10' cord in lieu of 20' (per foot) 16B 15' cord in lieu of 20' (per foot) 16C 30' cord in lieu of 20' (per foot) 16D 40' cord in lieu of 20' (per foot) 17A SJE SignalMaster® / mounting strap (per foot) 17B SJE SignalMaster® / externally weighted (per foot) 17C Sensor Float® / internally weighted (per foot) 17D Sensor Float® / externally weighted (per foot) 17E Sensor Float® Mini / pipe clamp (per foot) 17F Sensor Float® Mini / externally weighted (per foot) 19T TOA (Test/Off/Automatic) switch and pump run light through door mounted 19U HOA (Hand/Off/Automatic) switch and pump run light through door mounted 19X Door mounted pump run indicator 21A SJE PumpMaster® in lieu of on/off switches ● 21B SJE PumpMaster® Plus in lieu of on/off switches ● 21C Super Single® in lieu of on/off switches ▲ 21D Double Float® in lieu of on/off switches ▲ <p>● Mechanically-activated ▲ Mercury-activated</p>
---	--

SAMPLE

MODEL 112 I W 9 I 4 H 3A 8A

Alarm Package _____
Enclosure Rating _____
Starting Device _____
Pump Full Load Amps _____
Pump Disconnect _____
Float Switch Application _____
Options: Flasher, Elapsed Time Meter _____

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Sheet Title:
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SYSTEM
PLAN**

DRAWING

11 WWT-1
9 of 1 sheets

10/8/07
6: 1" = NA

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AS
1" = 80MM



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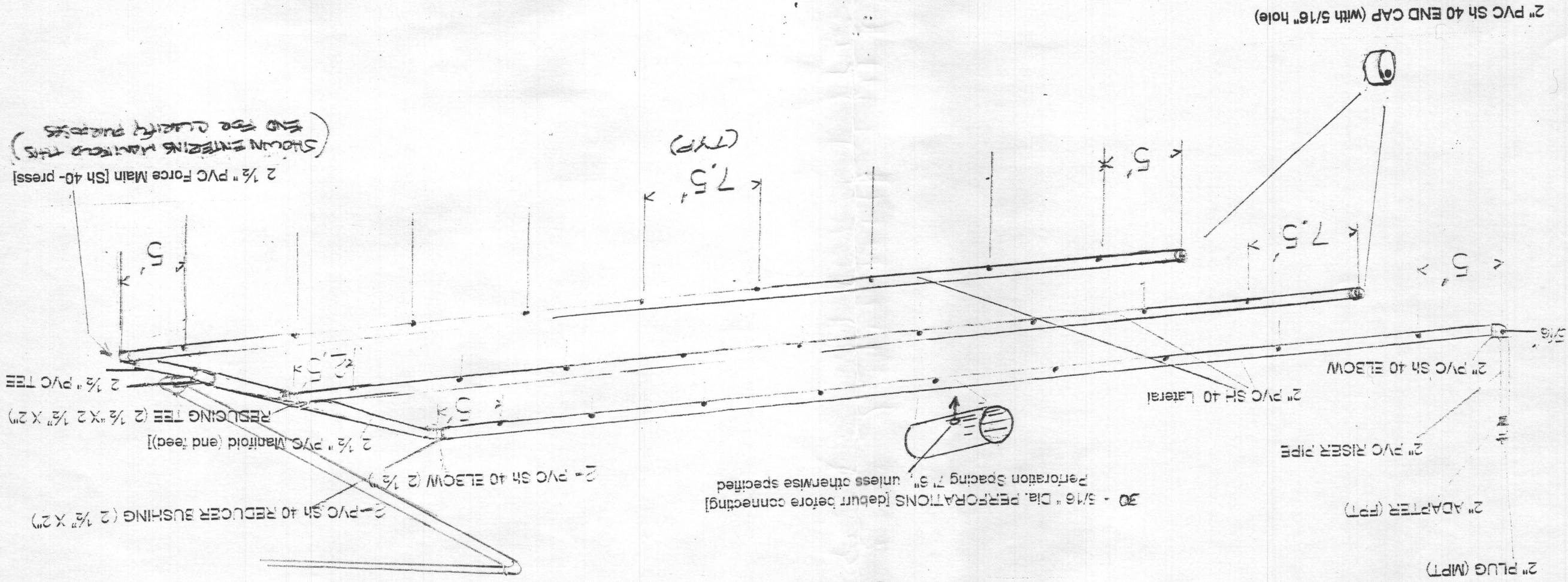
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DRAWING
11 WWT 1 of 1
10 of 1 Sheet

SHALLOW IN-GROUND ABSORPTION BED
LOW PRESSURE DISTRIBUTION SYSTEM
DRILLING MENU

30 - 3/16" Dia. PERFORATIONS [deburr before connecting]
Perforation Spacing 7" 5", unless otherwise specified



2 1/2" PVC Force Main [Sh 40-press]
(SHOW ENTERING MANHOLE THIS)
END FOR CLARITY PURPOSES

2 - PVC SH 40 REDUCER BUSHING (2 1/2" X 2")
2 1/2" PVC Manifold (end feed)
REDUCING TEE (2 1/2" X 2 1/2" X 2")
2 1/2" PVC Tee

2 - PVC SH 40 ELBOW (2 1/2")
2" PVC SH 40 Lateral
2" PVC SH 40 ELBOW
2" PVC RISER PIPE
2" ADAPTER (FPT)
2" PLUG (MPT)

2" PVC SH 40 END CAP (with 5/16" hole)

CONSTRUCTION PROCEDURES*

* [Modified for Shallow In-Ground Bed Structure]

5.1. GENERAL

Proper construction is extremely important if the sand mound is to function as designed. Installation of a sand mound system is prohibited when soils are frozen. Construction of the ~~bed~~ mound should not occur if the soil is too wet. Compaction and puddling of the soil in the location of the mound and downslope should be avoided. Soil is too wet for construction of the ~~manifold~~ manifold if a sample, taken anywhere within the upper eight inches, when rolled between the hands forms a wire. If the sample crumbles, the soil is dry enough for construction to proceed.

5.2. EQUIPMENT

The following special equipment is recommended:

1. A small track-type tractor with blade for placing and spreading the sand-fill. ^{STRAVEL}
2. A cordless drill for drilling holes in the pipe on-site.
3. A moldboard or chisel plow for plowing the soil within the perimeter of the ~~bed~~ mound. A rototiller may be used on structureless soils with USDA sand textures.
4. A rod and level for determining bed elevations, slope on pipes, outlet elevation of septic tank, slope of site, etc.

5.3. MATERIALS

The following specifications are required:

1. Sand fill material must be approved by the local Approving Authority prior to hauling to the site. Submit a sample to the local Authority for analyses at least three weeks in advance of construction or select a sand fill from the list of potential sand suppliers. If a sample is submitted for analyses a fee will be charged. Sand fill shall have an effective size between 0.25 mm and 0.5 mm with a uniformity coefficient of 3.5 or less. A copy of the receipt from the sand supplier showing the company name, address, phone number, date and product name will be required.
2. Aggregate shall be clean aggregate free of fines and between 3/4 to 2 inches in diameter.
3. Geotextile fabric shall be of a type approved by the Approving Authority.
4. Cap material shall be soil relatively free of coarse fragments and preferably a clay loam or silt loam texture.

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material into place using a small track-type tractor with a blade. Work from the end and upslope side. Always keep a minimum of six inches of material beneath the tracks of the tractor to minimize compaction of the natural soil. The ~~fill~~ material should be worked in this manner until the height of the fill reaches the elevation of the top of the absorption bed.

- 5.5.3 With the blade of the tractor, form the absorption bed. Hand level the bottom of the bed and check it for proper elevation. The bed should be level for proper functioning of the mound. Call for inspection.

MA 5.5.4 Shape the sides of the sand fill to design slope (ie., 3:1 or flatter).

5.6. BED AND DISTRIBUTION NETWORK

- 5.6.1 Carefully place the coarse aggregate in the bed. Do not create ruts in the bottom of the bed. Level the aggregate to a minimum depth of six inches.
- 5.6.2 The distribution network is assembled in place setting the manifold to ensure draining the laterals between doses. The laterals should be laid level with the holes directed downward. Call for inspection. Test the pumping chamber and distribution network with clean water.
- 5.6.3 Place additional aggregate to a depth of at least two inches over the crown of the pipe.
- 5.6.4 Place the approved geotextile fabric over the aggregate bed. The fabric may extend beyond the bed ~~over the sand fill~~ ^{over native soil (UNDISTURBED)}.

5.7. COVER MATERIAL

- 5.7.1 Place a finer textured soil material such as sandy clay loam, clay loam, or silt loam on top of the fabric over the bed. The minimum depth of this cap shall be six inches at the outer edges of the bed and 12 inches along the center.
- 5.7.2 Place a minimum of six inches of good quality topsoil over the entire mound surface including the sideslopes. Call for final inspection.

5.8. VEGETATION

- 5.8.1 Fertilize, lime, seed and mulch the entire surface of the mound. Grass mixtures adapted to the area should be used.
- 5.8.2 Consult the county extension agent or Soil Conservation Service for recommendations.

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5.4. TANK INSTALLATION AND SITE PREPARATION

- 5.4.1 Locate and rope-off the entire sewage disposal area to prevent damage to the area during other construction activity on the site. Vehicular traffic over the disposal area should be prohibited to avoid soil compaction.
- 5.4.2 Install septic tank(s) and pumping chamber(s) and pump as shown on the drawings. Call for inspection.
- 5.4.3 Stake out the initial and recovery mound perimeters in their proper orientation as shown in the drawings. Reference stakes offset from the mound corner stakes are recommended. Locate the upslope edge of the absorption bed within the mound and determine the ground elevation at the highest location. Reference this elevation to a benchmark for future use. This is necessary to determine the bottom elevation of the absorption bed.
- 5.4.4 Excess vegetation should be cut and removed. Trees should be cut at ground level and stumps left in place.
- 5.4.5 Determine the location where the force main from the pumping chamber will connect to the distribution network manifold within the mound. ~~BEFORE EXCAVATION~~ ^{BEFORE EXCAVATION}
- 5.4.6 Install the force main from the pumping chamber to the proper location within the mound. Pipe should be laid with uniform slope back to the chamber so that it drains after dosing. Cut and stub off pipe one foot below existing grade within the proposed perimeter of the initial mound. Backfill trench and compact to prevent seepage along the trench.
- 5.4.7 Plow the soil within the perimeter of the mound to a depth of about eight inches, if the soil is not too wet. Moldboard or chisel plows may be used. Plowing should be done along the contour, throwing soil upslope. Use a two bottom or larger Moldboard plow. In wooded areas with stumps, roughening the surface to a depth of four to six inches with backhoe teeth may be satisfactory. However, all work should be done from the upslope or sides of the mound if at all possible. Rototilling may be used on soils with USDA textures of sand. After plowing, all foot and vehicular traffic shall be kept off the plowed area.

5.5. FILL PLACEMENT

- 5.5.1 Relocate and extend the force main several feet above the ground surface. ~~BEFORE EXCAVATION~~ ^{BEFORE EXCAVATION}
- 5.5.2 Place the approved sand-fill material on the upslope edge(s) of the plowed area. ~~Keep delivery trucks off the plowed area. Minimize traffic on the downslope side. Fill should be placed and spread immediately after plowing. Move the fill~~ ^{side.}

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11 of 11 Sheets