LAYOUT _____ INSP 4 _____

INSP 2 _____ INSP 5 _____

INSP 3 _____ INSP 6 _____

ISSUE DATE: 8/8/06

PERMIT

P 525214

APPROVAL DATE: _____

A 522089

SANDMOUND SYSTEM
ON-SITE SEWAGE DISPOSAL SYSTEM
HOWARD COUNTY HEALTH DEPARTMENT
BUREAU OF ENVIRONMENTAL HEALTH
Tax ID

KHATRACO, LLC IS PERMITTED TO INSTALL ☒ ALTER ☐

ADDRESS: 13706 MARIANNA Dr. Rockville PHONE NUMBER: 301-603-8400

SUBDIVISION: _____ LOT NUMBER 4

ADDRESS: 7145 Brooks Road PROPERTY OWNER: Omololu Oyekan

SEPTIC TANK CAPACITY (GALLONS): 2000 OUTLET BAFFLE FILTER REQUIRED ☐

PUMP CHAMBER CAPACITY (GALLONS): 2500 COMPARTMENTED TANK REQUIRED ☒

NUMBER OF BEDROOMS: 6

Size 900 GPD Gravel bed 9.75 ft by 92.3 ft

LOCATION:	Sand mound to be installed see approved plan for location and elevations.
NOTES:	Sand mounds should be staked and keep heavy equipment off location.

PLANS APPROVED: Michael J. Davis DATE: 08/01/2006

NOTES: PERMIT VOID AFTER 2 YEARS
CONTRACTOR IS RESPONSIBLE FOR SCHEDULING A PRE-CONSTRUCTION INSPECTION FOR ALL INSTALLATIONS
WATERTIGHT SEPTIC TANKS REQUIRED
ALL PARTS OF SEPTIC SYSTEM SHALL BE 100 FEET FROM ANY WATER WELL UNLESS SPECIFICALLY AUTHORIZED
MANHOLE RISERS REQUIRED ON ALL SEPTIC TANKS AND PUMP CHAMBERS UNLESS SPECIFICALLY AUTHORIZED
CONTRACTOR RESPONSIBLE FOR COMPLIANCE WITH APPLICABLE REGULATIONS, GUIDELINES AND THE TERMS OF THIS PERMIT

NEITHER THE HOWARD COUNTY COUNCIL NOR THE HEALTH DEPARTMENT IS RESPONSIBLE FOR THE SUCCESSFUL OPERATION OF ANY SYSTEM
PERMITTEE RESPONSIBLE FOR OBTAINING FINAL APPROVAL ON THIS PERMIT
CALL 410-313-1771 FOR INSPECTION OF SEPTIC SYSTEM

NOT TO SCALE

ROAD

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

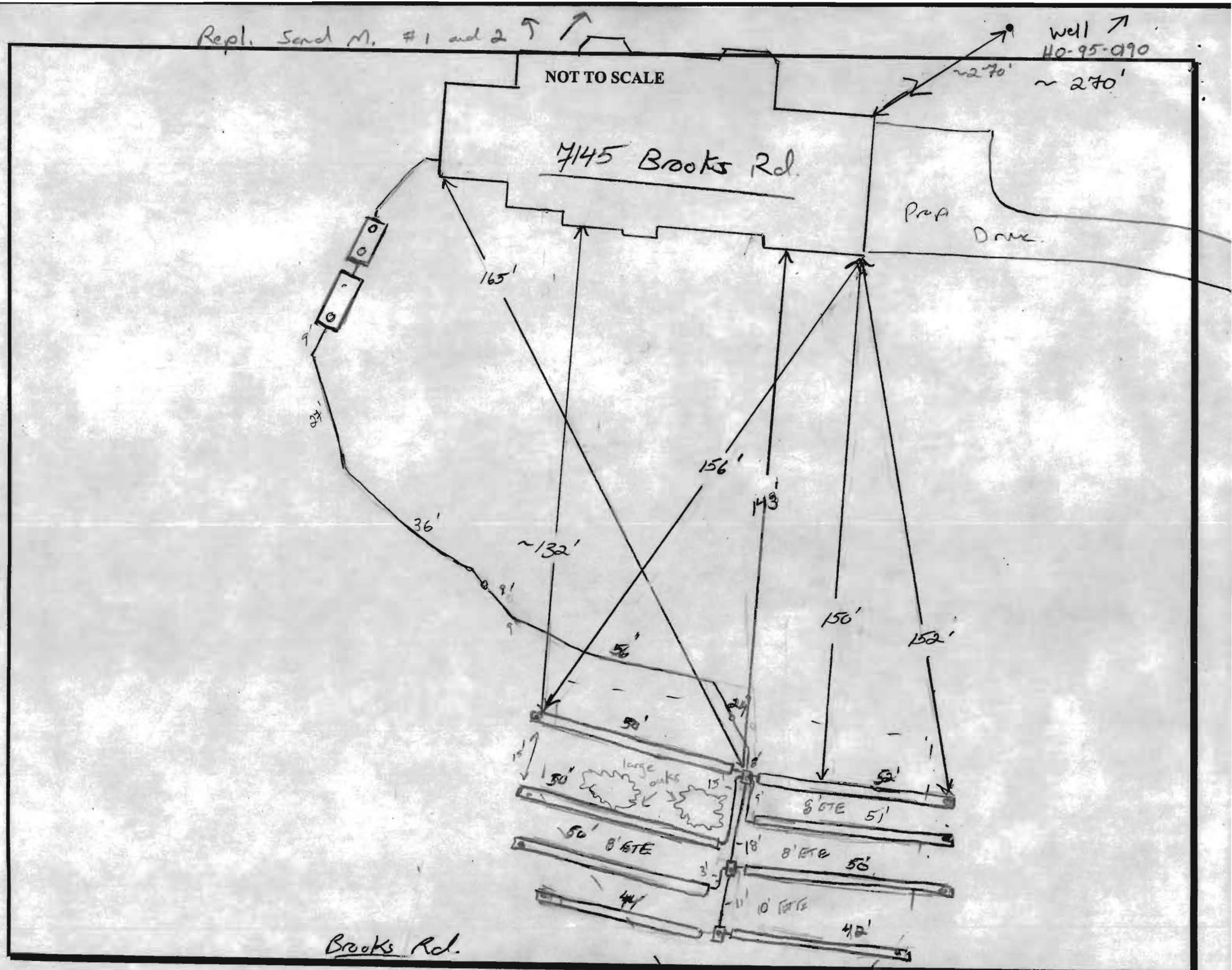
SEPTIC TANK 1 LEVEL Yes
CAPACITY 2000 GAL
SEAM LOC Top
TANK LID DEPTH 2'
Mayer Bros. BAFFLES Yes
BAFFLE FILTER Zabel 8"x18"
MANHOLE LOC Front/Rear
6" PORT LOC —
WATERTIGHT TEST —
Pump ~~SEPTIC~~ TANK 2 LEVEL Yes
CAPACITY 2250 GAL
SEAM LOC Top
TANK LID DEPTH 2'
BAFFLES Front
BAFFLE FILTER —
MANHOLE LOC Rear
6" PORT LOC none
WATERTIGHT TEST —

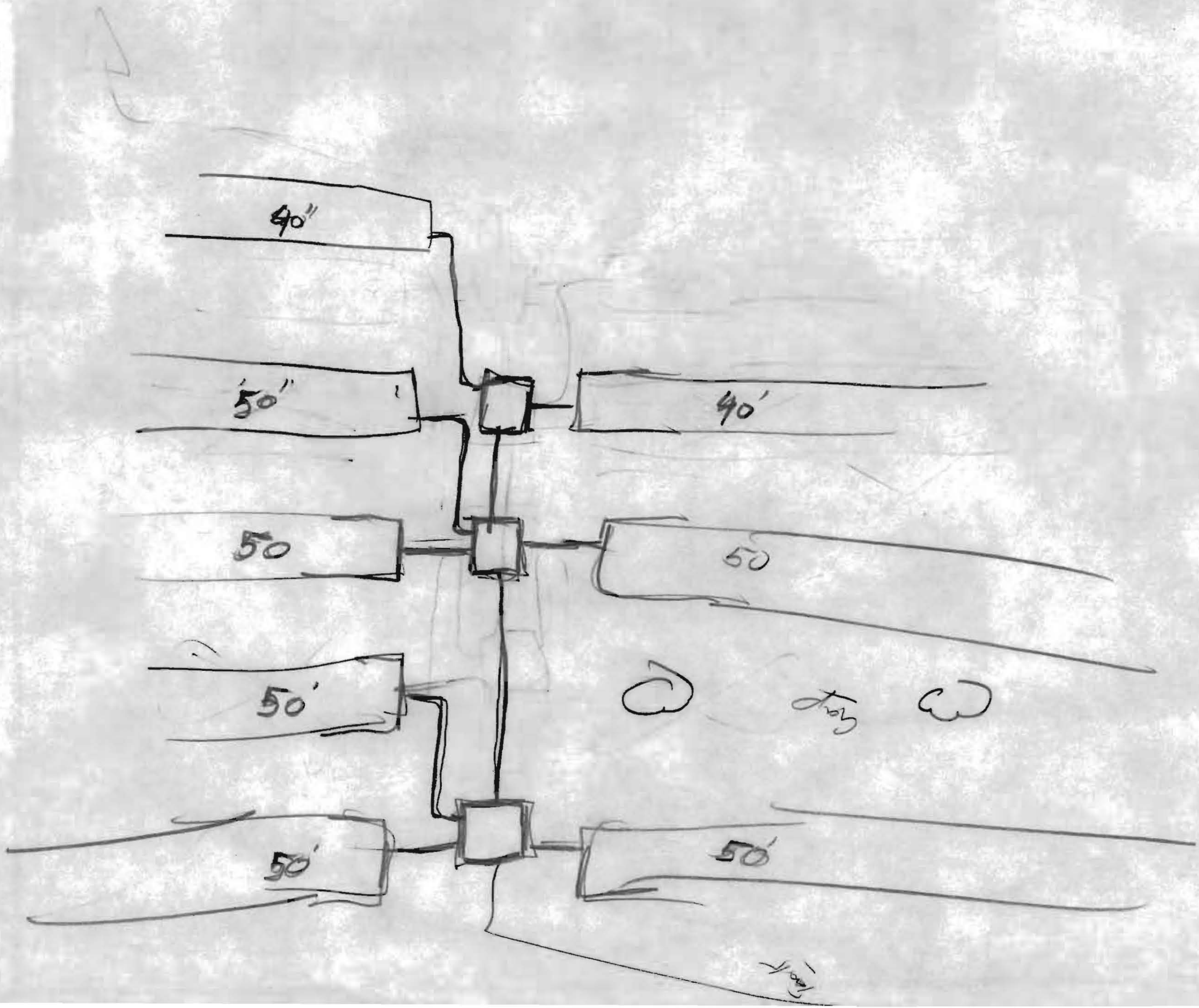
PRE-CONSTRUCTION 10/5/07 site did not match up to plan. Do not continue. OK to haul sand away from mound area. (KW)

INSTALLATION 10/9/07 Mound area contoured not staked according to plan. May need to use site #2 due to cut and fill in site #3. Call for site approval and mound stake out when area staked. (KW) 10/18/07 In an attempt to try and design a mound on contour w/ Gary, could not get bed on contour (1 foot differences). Homeowner and developer need to remark plan out again (KW) See other Permit for continued notes...

→

FINAL INSPECTOR _____ DATE OF APPROVAL _____


Repl. Sand M. #1 and 2
NOT TO SCALE
Well
HO-95-090
~270'
~ 270'
7145 Brooks Rd.
Prop
Drive
165'
156'
143'
~132'
36'
150'
152'
56'
90'
24'
15'
large oaks
50'
15'
52'
8' GTE
51'
50'
8' GTE
18'
8' GTE
50'
3'
44'
11'
10' GTE
42'
Brooks Rd.


40"
50"
50
50'
50'
40'
50
Gap
50'
Track

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

WASTEWATER DISPOSAL SYSTEM

Approved Septic System Plan
Howard County Health Department
T. Davis 8/1/06
Signature Date

Re. HCHD File A522089

Project Title: Mr. Omalalu James Oyekan

Address: 7145 Brooks Rd, Highland MD 20777

WASTEWATER DISPOSAL SYSTEM
SAND MOUND DESIGN

Design for: **Oyekan Property**
7145 Brooks Road, Howard County, Md.
Tax Map 40, Parcel #254, Raymond Morgan Subdivision Lot 4
Design by: **INNOVA, LTD.**
New Windsor, Md.

Basis: 6 Bedroom Residential Dwelling (new construction)
Percolation Testing: Sand Mound (S/M) method
Six tests @22", or 24"- -Average: 6.0 minute/inch = Conventional Sand Mound
[worst measurement (below S/M test depth), @42": 45 min./inch]

General Description:
Site adjacent to, and elevated, above Brooks Road, near Highlland, MD. The terrain slopes down, to the north west, approximately 630-650 feet from the southeast corner of the lot to Brooks Road. The Septic Disposal Area (SDA) is located in predominantly Glenelg soil series, and grades down slope to Manor series soils. The loam / sandy loam soils transition with depth to horizons with higher clay content and an increasing percentage of rock fragments, usually mica-schist. Considering information from testing, in what was determined to be the most restrictive soils in the SDA, the Howard County Bureau of Environmental Health determined that the lot was a suitable for the application of sand mound wastewater (sewerage) disposal.
Percolation testing was conducted by the Bureau of Environmental Health, Howard County Health Department (HCHD) August 16, 2005. A letter speaking to the test results and HCHD interpretation of the findings, were forwarded to the owners. The attached drawings for the wastewater system location and design are based on the percolation certification plat (dated 9/9/05) by Tri-County Surveys, Inc. and forwarded to INNOVA Ltd. by the Builder, KHATRACO, LLC. System design is based upon requirements imposed by the Design Flow figure, HCHD letter to the owner, and mound disposal structure characteristics.

WASTEWATER SYSTEM COMPONENTS:
The six bedroom (900 gpd) dwelling requires a septic tank (1750 gallon minimum) capable of retaining a day's (24 hours) wastewater flow from the house (effluent), and permitting bacterial action to take place and reduce Biological Oxygen Demand (BOD) organic contaminant levels, before discharge of the wastewater to the soils of the environment.
Septic Tank - COMAR 26.04.02.05E. [4/bedroom: 1250 gal. + 250 gal. ea. add'l bedroom] min. 1750 gal.
Hence:
Septic Tank - 2000 gal., Top-seam, Two-compartment tank with effluent filter (discharge port) (7-13).

Note:*Pressurized wastewater distribution/disposal is a requirement, by regulation, for sand mound bed disposal.*

Pump Chamber: 2500 gal. (custom size), 17 ton, single compartment, tank receives septic tank flow, provides storage, and performs as a flow modulator [tank must store one day of flow (900 gallons) volume above the high water alarm]. The pump chamber contains a pump and the associated switch control floats (6-13). Effluent (sewerage pumped) is discharged in measured doses through a two and one half inch (2.5") diameter Force Main to disposal in the 121' X 39.5' Mound structure. In the ***Sand Mound*** distribution is handled by center-feed 2.5" Manifold, and six (6) - 1 1/2" PVC Laterals. Piping lengths and layout are shown on the plan (10-13).

James Oyekan
7145 Brooks Rd, Highland MD

Sheet Title:
WASTEWATER
SYSTEM
PLAN

Sheet#
WWT-1
1 of 13 Sheets

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H. Dale Gray, Principal

Date: 6/6/06
Scale: 1" =

Stake out for
this mound should
include.

1. Toe slope at same elevation.
2. Bottom edge of bed no more than 6" elevation difference.
3. 4 corners of mound.
4. 4 corners of bed.
5. Additional 5-10 stakes to delineate arcs.
6. Manifold connection.
7. Stake out for replacement mound.

SAND MOUND DESIGN

Design for: **Oyekan Property [six (6) Bedroom Home]**
7145 Brooks Road, Howard County, Md.
Tax Map 40, Parcel #254, Raymond Morgan Subdivision Lot 4

SAND MOUND CALCULATIONS: SM test locations #1,#2,#3,#4,#5,#6
(Designed in accordance with MDE Design and Construction Manual for Sand Mound Systems, June 1991)
Mound Areas [slope position]:
upper (Initial Mound), middle (Replacement #1), and bottom (Replacement #2)
INITIAL MOUND, and Replacement #1 [10% Slope, contour 483' to 474'], also
Replacement #2 [10% Slope, contour 479' to 469']
ABSORPTION BED: 900 Gal÷1.0 gpd per ft² (sand loading rate alternative sand media)[1] = **900ft²**
BED WIDTH (selected width)**(A) = 9.75 feet** BED LENGTH **(B)** 900ft² ÷ 9.75ft = **92.3 feet**

UPSLOPE FILL **(D) = 24 inches (specified by Howard County Health Department**

DOWNSLOPE FILL **(E) = 35.7 inches**

CAP + TOPSOIL FILL (at Bed Center) **(H) = 18 inches**

CAP + TOPSOIL FILL (at Bed Edge) **(G) = 12 inches**

TOTAL BED DEPTH **(F) = 10 inches** MOUND HEIGHT = **52 inches** (above native surface)

SIDE SLOPE SETBACK **(K) = 173.55 inches (14.46 feet)**

UPSLOPE SETBACK **(J)** 10% slope (.77 corr.) = **106.26 inches (8.86 feet)**

DOWNSLOPE SETBACK 10% slope (1.44 corr.) **(I) = 249.26 inches (20.72 feet)**

TOTAL WIDTH (W) = **472.78 inches** **TOTAL LENGTH** (L) =**1454.7 inches**
mound or (W)= **39.39 feet** x (L)= **121.2 feet**

Basal Area required: 900 gpd Design Flow = **1200 ft²**
.75 gpd/ft² [worst case, Soil Loading (Manual, table 3.3 loams, silt loams 31-45 min.]
Basal Area (sloped) provided: [(A+I) X B] = **2,816 ft²** 1200/2816**[adequate]**

Linear Loading (allowed, <10gpd) : 900 gpd ÷ 92.3' (bed) = **9.75 gpd/ft, OK**

INSTALLATION:
Follow the recommended installation schedule as found in Section 5, "Construction Procedures" in the *DESIGN AND CONSTRUCTION MANUAL FOR SAND MOUND SYSTEMS* (June 1991), also plate 11 of this submittal.

2-13

2-13 Revised Work Sheet

7145 Brooks Rd James Oyekan Property
Highland, MD 6 Bedrm Residence
Alternative Sand Media Design
<10 gpd Linear Load Rate

TABLE 3.1

EQUATIONS FOR CALCULATING SAND MOUND DIMENSIONS

MOUND AREAS: UPPER [INITIAL] ; MIDDLE [REPL #1] 483-474 Contours, 10% Slope, LOWER [REPL #2] 479-469 Contours 10% Slope

Absorption bed ft.² (A × B) = Design flow (900 GPD) = 900 ft.²
1.0 gpd/ft.² (ALTERNATIVE MEDIA)

Bed length (B) = 92.3 ft. (21 ft. to 101 ft. dependent on site)

Bed width (A) = Bed 900 ft.² / B 92.3 ft. = 9.75 ft. (15 ft. or less)

Upslope sand fill depth (D) = 48 in. − Z in. = 24 in. (12 in. min.) (2.0')

Downslope sand fill depth (E) = [12 A × % slope] + D in. = 35.7 in. (2.97')

Cap + topsoil at bed center (H) = 18 in.

Cap + topsoil at bed edge (G) = 12 in.

Total Bed Depth (F) = 10 in.

Sideslope setback (K) = [(D + E) / 2 + 28 in.] × 3 = 173.55 in. (14.46')
(51.36)

Upslope setback (J) = (22 in. + D) × 3 × upslope corr. factor [.77] = 106.26 in. (8.86')

Downslope setback (I) = (22 in. + E) × 3 × downslope corr. factor [1.44] = 249.26 in. (20.77')

Total Width of Mound (W) = 12A + J + I = 472.78 in. (39.39')

Total Length of Mound (L) = 12B + K + K = 1454.7 in. (121.2')

ADDITIONAL DATA [if required]
Basal Area [Ft²] required: design flow (gpd) (900 GPD) / Soil perc. rate (loading rate) 0.75 (worst case) = 900/0.75 = 1200 Ft² Mound (Basal Area Required)

Basal Area provided:
Slope: [Bed width + downslope setback] X Bed length
Level: Mound length X width

(9.75+20.77') X 92.3' = 2816.99 ft² (Basal Area Provided)

LINEAR LOADING RATE:
900 GPD (DESIGN FLOW) / LENGTH 92.3' = 9.75 GPD/Ft

James Oyekan
7145 Brooks Rd, Highland M

Sheet Title:
WASTEWATER SYSTEM PLAN

Sheet#
WWT-1
2 of 13 Shee

Date: 6/16/06
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H. Dale Gray, Principa

WASTEWATER DISPOSAL SYSTEM
SAND MOUND DESIGN

Design for: **Oyekan Property**
7145 Brooks Road, Howard County, Md.
Tax Map 40, Parcel #254, Raymond Morgan Subdivision Lot 4

DISTRIBUTION
PRESSURE DISTRIBUTION NETWORK /PUMPING SYSTEM
(Designed in accordance with MDE Design and Construction Manual for Sand Mound Systems, June 1991)

DESIGN FLOW: 6 Bedrooms X 150 gal/day = **900 Gallons per Day**

The 92.3' X 9.75' absorption bed is dosed by a center feed [bed exceeds 51', MDE Design Manual] piping arrangement consisting of three bed length pipe runs divided into six, 1 1/2" PVC pipe laterals extending from the center manifold. This, in agreement with MDE preferred distribution design, and allows 3' spacing between the pipe laterals runs. The laterals distribute the pumped effluent through a total of 36, 5/16" perforations spaced (see below) 7.6' apart [91"]. At the selected 2' field operating pressure head the *flow rate of the lateral arrangement is 36 X 1.63 gpm,* or 58.68 gpm see (5-13). This flow is a balance of flow volume and gpm rate to retain reasonable pump size, and to maintain proper pipe flow velocity (2-5 fps).

Laterals (fig. 4.3, Design Manual), of 1 1/2" diameter with a field flow of 58.68gpm will accommodate a 7.6' (91") perforation spacing.

Field Flow Rate:58.68 gpm (above)

Pipe Volumes: 2 1/2" force main(24.9 gal/100'), 1 1/2" laterals(10.6 gal/100')

Dose Applied ea. Event - Determined by 1/6 of flow , or piping volume (largest figure is used)

6 Event Dose: (1/6 of Design Flow , 900 gallons) = 150 gal.,
or:
Pipe Volume Dose (382' force main + 6' manifold + 5 X volume of laterals) = 241 gal.
241 gallons used

DOSING SCHEDULE: to deliver the 241 gal. dose, it is necessary to allow for the filling of the force main (96.6 gallons) before water enters the absorption bed, and is the pipe drain back amount returned to the pump tank when the pump stops .

Volume Pumped ea. Event = 241 gal.+ 96.6 gal., or 337.6 gal.

Pump Run Time:337 gal ÷ 58.68gpm.= **5.74 minutes per dose/event**
900 gal. ÷ 241gal./dose = 3.74 (say 3) applications/day
5.74 minutes X three times daily = **daily run time of 17.22 minutes**

3-13

see Comm re 26.04.02.05-(3) 3 ex a day dosing

James Oyekan
7145 Brooks Rd, Highland MD

Sheet Title:
WASTEWATER SYSTEM PLAN

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H. Dale Gray, Principal

WASTEWATER DISPOSAL SYSTEM
SAND MOUND DESIGN

Design for: **Oyekan Property**
7145 Brooks Road, Howard County, Md.
Tax Map 40, Parcel #254, Raymond Morgan Subdivision Lot 4

DISTRIBUTION

PRESSURE DISTRIBUTION NETWORK /PUMPING SYSTEM
(Designed in accordance with MDE Design and Construction Manual for Sand Mound Systems, June 1991)

PUMP SELECTION

PUMP SIZING: Simplex Pump arrangement

Pump, Head Calculations

Static Head, difference pump off elev. to mound manifold elev. 484.33' [446.27']= **38.06'**

Friction Head (@ 60 gpm 2 1/2" dia. loss:2.46'/100' pipe)
2 1/2" Pipe Run - 388' force main/manifold [3.88 X 2.46']

9.54'

fittings 2 1/2" (Loss)

1- 2" HP gate valve	1.6'
4- 90 ells	32.0'
15 -couplings	37.5'
2 - side tees	24.0'
	95.1' 2.46 X.95.1=2.34' (elev.)

2.34'

Field Operating head **2.0'**

TOTAL DYNAMIC HEAD **(TDH)** **51.94'**

From the attached pump curves (9-13): Pump selected at 51.94 feet of head and pumping requirement of 58.68 gpm

USE: GOULD Submersible Effluent Pump: **Model 3885**
No. WE1512HH
(1 1/2 HP.; 230 volt; Single Phase- 3500 RPM See Pump Curve)

A Simplex Control Panel is required to manage the pumping system by turning the pump on and off for daily dosing as well as provide warning, in the event of pump failure. The Control Panel must be located in a well -observed area, preferably near the pump tank. (See 9-13)

James Oyekan
7145 Brooks Rd, Highland MD

Sheet Title:
WASTEWATER SYSTEM PLAN

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H. Dale Gray, Princi

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WASTEWATER DISPOSAL SYSTEM

SAND MOUND DESIGN

Design for: **Oyekan Property**
7145 Brooks Road, Howard County, Md.
Tax Map 40, Parcel #254, Raymond Morgan Subdivision Lot 4

DISTRIBUTION

PRESSURE DISTRIBUTION NETWORK / Bed Laterals

(initial field flow rate assumes full bed length for perforation quantity determination, and can change when balancing pump size and system needs)

Center Feed arrangement (Based on an absorption Bed length 92.3' long, 9.75 ' wide)
1 1/2" PVC Sch. 40 (press.), selected, [MDE manual fig 4-1 (L = 36 - 47 feet length)],
actual lateral length is as shown below (after off-set from bed ends) .

First perforation (perf.) from manifold [MDE Design Manual 4.2.5]
92.3' X 50% - [[(6 perf. - 1) X 7.6' sp.]] ÷ 2 = 4.075' (49")
Also each lateral is set back, 4.075' from the bed end (s), and is 42' 1" in length from the manifold.
Note: perforation spacing relates directly to bed length, not pipe length. . .

6 Perforations (5/16" dia) per lateral (10-13 see menu)
Perforation Spacing - 91 inches (7.6 feet)
First perforation (from manifold) - **49 inches** (4.08 feet)
Last perforation- (49" from end of bed) Drilled in crown of lateral endcap, or elbow if turn-up.

Layout Note: Absorption bed width is divisible by 3, providing a three foot lateral separation and a one foot ten and one half foot (1' 10 1/2") separation from the outer laterals to the bed edge. See attached drawing (10-13).

James Oyekan
7145 Brooks Rd, Highland MD

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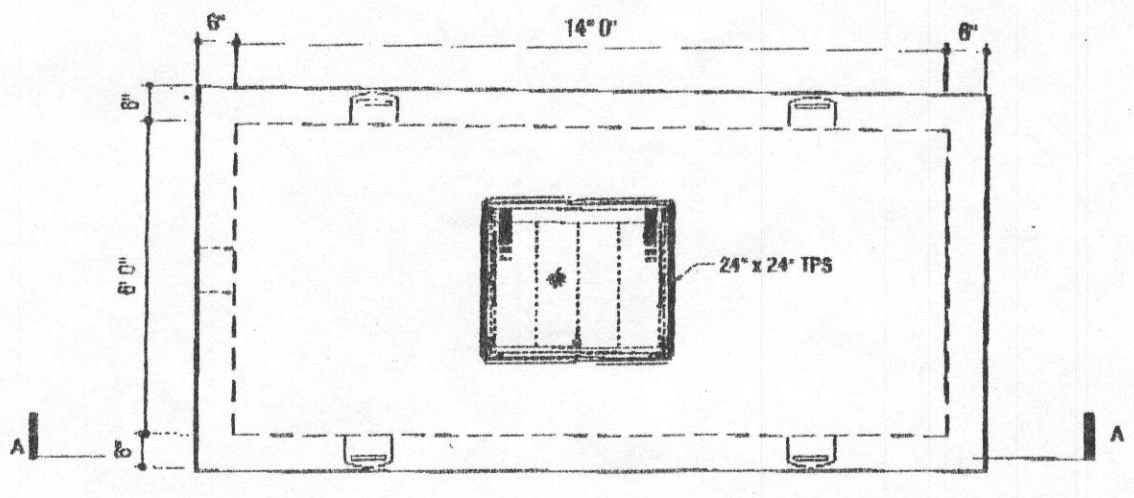
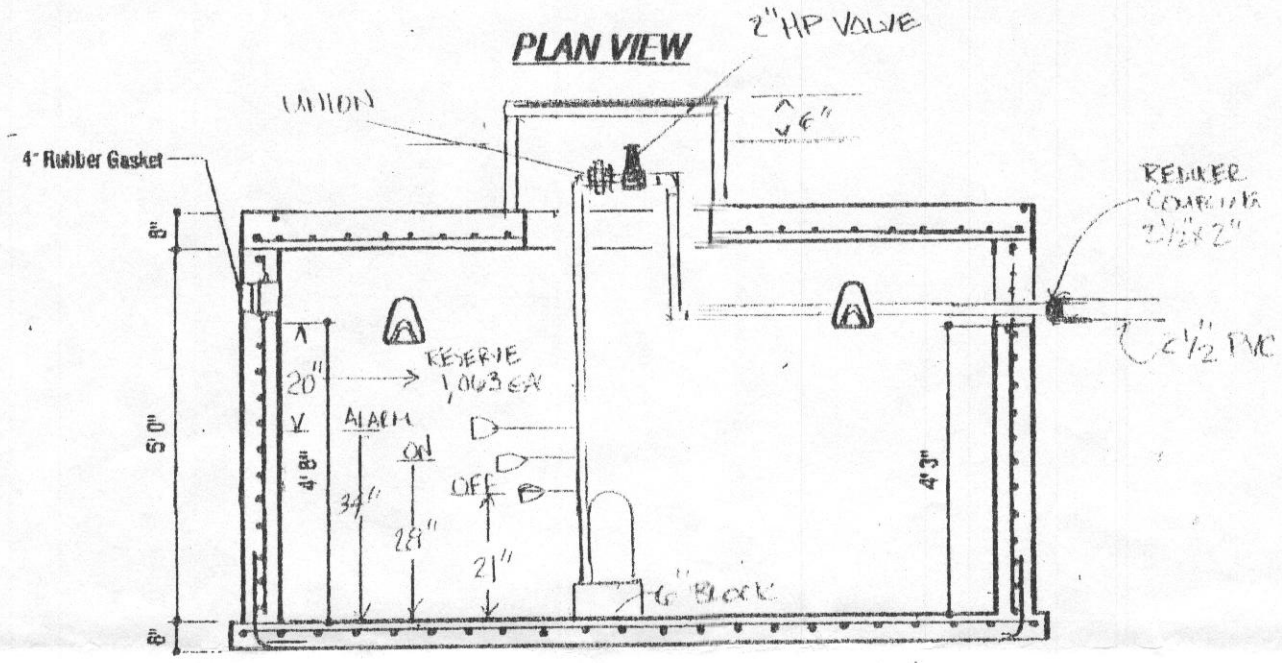


PLAN VIEW



SECTION A-A

1" DEPTH = 53.18 GAL.

DESIGN DATA & GENERAL NOTES

[1] Concrete strength f'c=5,000 p.s.i. @ 28 days. Density = 150 pcf.
[2] Cement - Portland Type I/II per ASTM C 150-92.
[3] Admixtures & plasticizers per ASTM C 260-86 & C 494-92.
[4] Reinforcing per ASTM A615, Grade 60, domestic. Min. 1-1/2" cover.
[5] Top slab sealed on jobsite with butyl rope mastic.
[6] Concrete is Air Entrained.

MBI
Mayer Bros., Inc.
6264 Race Road
Elkridge, Maryland 21075
Tel. 410.796.1434
Fax. 410.796.1438
www.mayerbrosprecast.com

2500 Gallon Non-Traffic Tank
KDAR

INNOVA, LTD.

Dwg. No. M757	No Scale	June 6, 2006

James Oyekan
7145 Brooks Rd, Highland MD

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WASTEWATER SYSTEM PLAN

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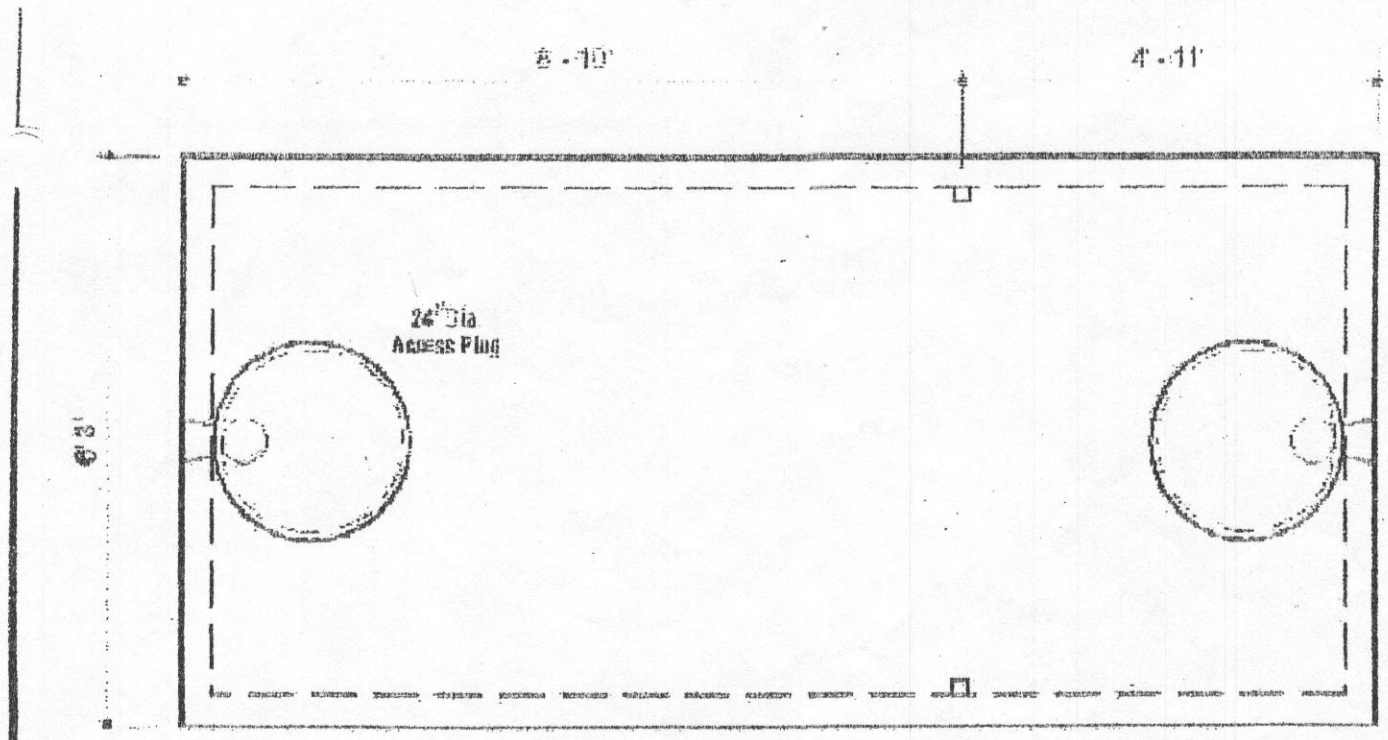
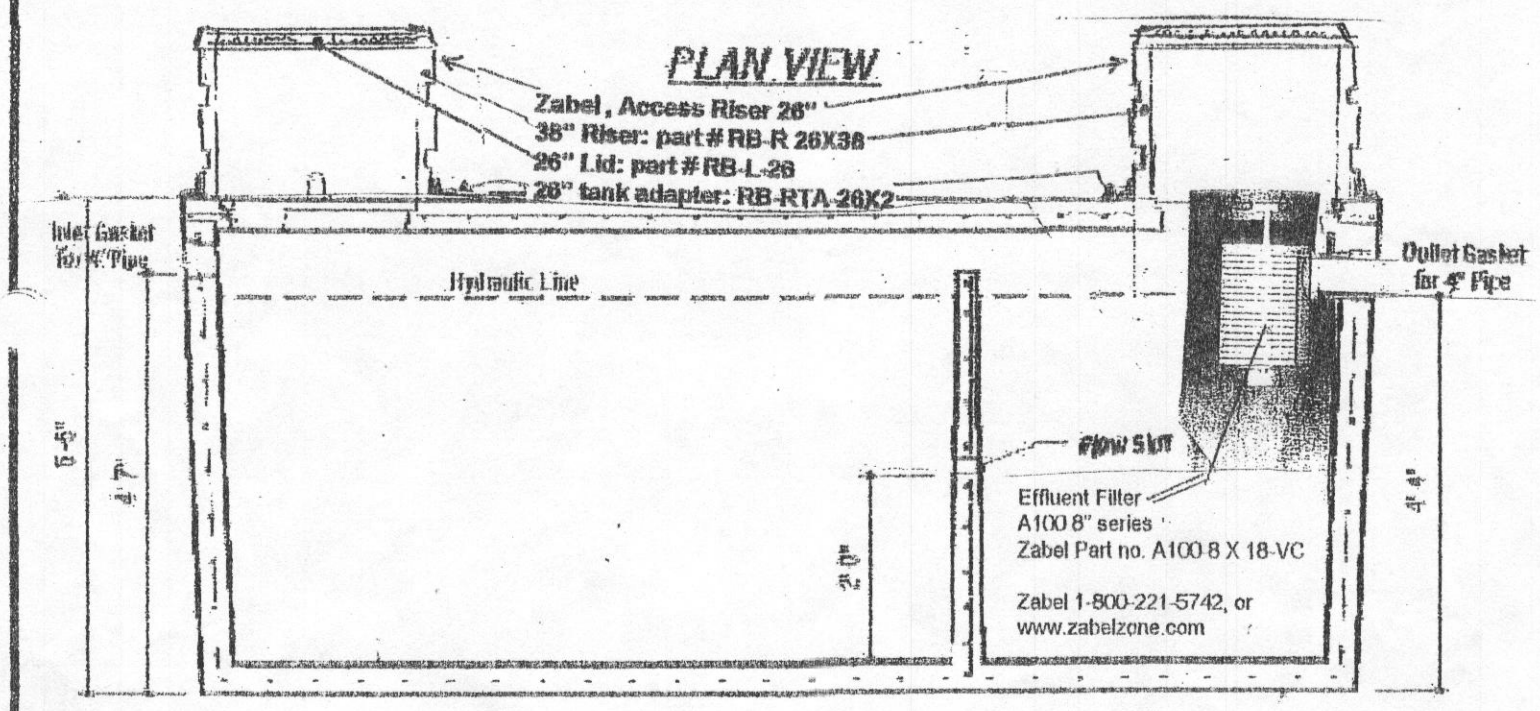


PLAN VIEW



SECTION A-A

DESIGN DATA & GENERAL NOTES

[1] Concrete strength f'c = 4,000 p.s.i. @ 28 days. Density = 150 pcf.
[2] Cement - Portland Type I/II per ASTM C 150-92.
[3] Admixtures & plasticizers per ASTM C 260-86 & C 494-92.
[4] Reinforcing per ASTM A185. Min. 1 1/2" cover.
[5] Top slab sealed with butyl rope mastic.
[6] 4" wall, 4" base, & 5" top thickness.

MBI
6264 Race Road
Upper Marlboro, Maryland 20772
Tel. 410.596.1434
Fax. 410.596.1430

2,000 GALLON SEPTIC TANK
2-Compartment
Stock Item [Approx. 19,900 lbs]

COMPONENT ELEVATIONS

Est. Surface Elevation	Element	Elevation
451.0'	**House Exit**	449.0'
451.0'	**2000 Gal Septic Tank** (S/T).	
	Top	449.4'
	Inlet	448.6'
	Outlet	448.35
	Base	444.35'
451.0'	**2500 Gal Pump Tank** (PT) .	
	Top	449.5'
	Inlet	448.0
	Base	443.5
	Discharge	448.0' to 450.0'

Est. Surface Elevation	Element	Elevation
	Force Main (3' burial)	
451.0'	Discharge	448.0'- 450.0'
479.0'	Turn	477.96'
482.0'	Turn	478.76'
481.5'	Turn	479.8'
	Initial Mound - Bed Manifold/Laterals	
481.5'	Turn up	480.0'
	Manifold	484.33'
481.5'	Mound **Apex**	486.0'

James Oyekan
7145 Brooks Rd, Highland MD

Sheet Title:
WASTEWATER SYSTEM PLAN

Sheet #
WWT-1
7 of 13 Sheets

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

Zabel A100 Residential and Commercial Septic Tank Effluent Filter

Why do septic tanks need an A100 Zabel Filter?

Homes, schools, churches, shopping centers, apartment and rental properties all have two things in common: Extremely high wastewater peak rates and no way to predict what the users of those septic systems are likely to put down their toilets and drains. Every year thousands of drain fields fail and under go expensive repairs because they are clogged with solids that got out of an unfiltered tank.

What does an A100 Zabel Filter do?

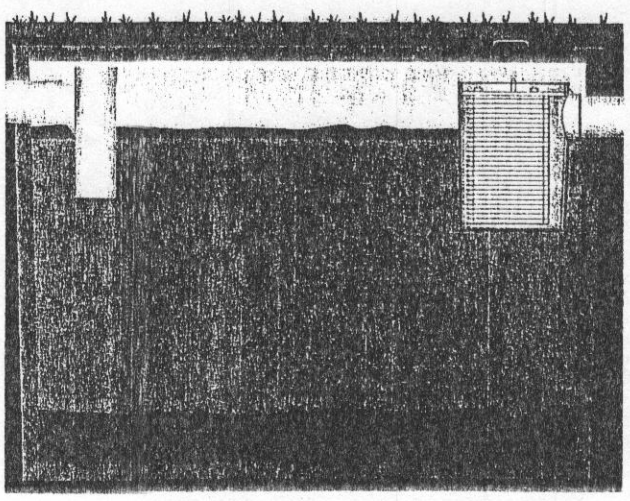
The A100 filter removes up to 90% of the solids and 45% of the BOD_5 from the waste stream. The Zabel A100 Residential and Commercial Effluent Filter removes all solids larger that 1/16" and protects the drain field from clogging with solids.

How often does the A100 Zabel Filter need Servicing?

The filter is virtually self cleaning. Anaerobic organisms on the filter discs partially digest lodged particles causing them to lose their buoyancy and fall to the bottom of the tank. In a standard residential installation the filter only needs to be cleaned when the tank is normally serviced. In commercial installations servicing will depend on the flow rate and solids loading characteristics of the wastewater.

What is the difference between a filter and a screen?

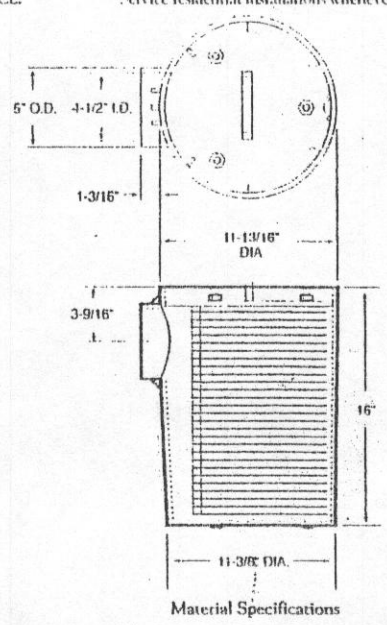
The larger filtration area of screens (usually five to eight times the size of filters) and the larger screen openings (1/8 inch for screens versus 1/16 inch for filters) are required because screens tend to plug easily and collapse. Zabel's exclusive patented disc dam design provides 198 lineal feet of filtration in a compact package16 inches high and less than 12 inches in diameter making it the easiest filter on the market to install and service without sacrificing its ability to remove solids from the waste stream.

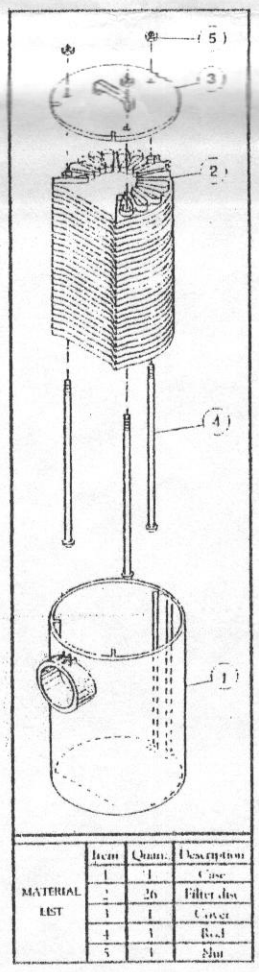


Call 1-800-221-5742 or Fax (502) 267-8801 for further information.

SPECIFICATIONS

APPLICATIONS:	The A100 is used in residential and commercial septic systems. It is effective in multi-family housing, rental property, schools, offices and everywhere wastewater has high suspended solids content.
FLOW RATE:	1,000 gpd per filter. Install two or more filters in a PVC or concrete manifold to achieve flows of 6,000 gpd or more. Check with Zabel for details.
FILTRATION:	The 26 Disc Dams @ 1/16 inch provide 198 lineal feet of filtration.
INSTALLATION:	The filter may be installed inside the tank or installed in a Zabel Container Assembly outside the septic tank.
SERVICE:	Service residential installations whenever you pump the tank.





	Item	Quan.	Description
MATERIAL LIST	1	1	Case
	2	26	Filter disc
	3	1	Cover
	4	3	Rod
	5	1	Nut

Material Specifications

Cases, Lids, Reducers	Rigid Vinyl PVC 87471
Discs	High Impact Polystyrene
Rod, Nuts	High Density Polyethylene

U.S. Patent No. 4,710,295

Call 1-800-221-5742 or Fax (502) 267-8801 for further information.

Table 1
How the Filter Works

- The filter first stills the water exiting the Tank by forcing the effluent over a horizontal Weir. This prevents solids carried by wastewaters or gases from exiting the tank as in tanks with a conventional tee. Contained within the filter are over 61 lineal feet of weir dams.
- Second, the opening between each weir dam is only 1/16 of an inch. Solids any larger than 1/16 of an inch are trapped within the filter and tend to fall back to the bottom of the tank.
- Finally, microorganisms grow on the edges of the weir. The microorganisms not only reduce the size of the opening for solid particles exiting the tank, but they also tend to digest the solids passing over the weir, further treating the effluent.

James Oyekan
7145 Brooks Rd, Highlan

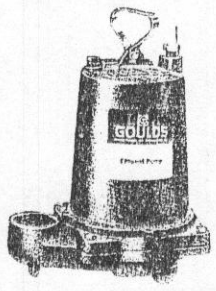
Sheet Title:
WASTEWATER SYSTEM PLAN

Sheet#
8 of 13 WWT Shé

6/16/06

1" =

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



Goulds

Submersible Effluent Pump

MODEL

3885

APPLICATIONS

Specifically designed for the following uses:
- Homes
- Farms
- Trailer courts
- Motels
- Schools
- Hospitals
- Industry
- Effluent systems

SPECIFICATIONS

Pump
- Solids handling capabilities: ¾" maximum.
- Discharge size: 2" NPT.
- Capacities: up to 128 GPM.
- Total heads: up to 123 feet TDH.
- Mechanical seal: silicon carbide-rotary seat/silicon carbide-stationary seal, 300 series stainless steel metal parts, BUNA-N elastomers.
- Temperature: 104°F (40°C) continuous 140°F (60°C) intermittent.
- Fasteners: 300 series stainless steel.
- Capable of running dry without damage to components.

Motor

Single phase:
- ⅓ HP, 115 V, 200 V, 230 V, 60 Hz, 1750 RPM; ½ HP, 115 V, 60 Hz, 3500 RPM; ½ HP – 1½ HP, 230 V, 60 Hz, 3500 RPM.
- Built-in overload with automatic reset.
- Class B insulation.

Three phase:
- ½ HP – 1½ HP 200/230/460 V, 60 Hz, 3500 RPM.
- Class B insulation.
- Overload protection must be provided in starter unit.
- Shaft: threaded, 400 series stainless steel.
- Bearings: ball bearings upper and lower.
- Power cord: 20 foot standard length (optional lengths available).

Single phase:
- ⅓ and ½ HP – 16/3 SJTO with 115 V or 230 V three prong plug.
- ¾-1½ HP – 14/3 STO with bare leads.

Three phase:
- ½-1½ HP – 14/4 STO with bare leads. On CSA listed models – 20 foot length SJTW and STW are standard.

FEATURES

Impeller: Cast iron, semi-open, non-clog with pump-out vanes for mechanical seal protection. Balanced for smooth operation. Silicon bronze impeller available as an option.

Casing: Cast iron volute type for maximum efficiency. 2" NPT discharge adaptable for slide rail systems.

Mechanical Seal: SILICON CARBIDE VS. SILICON CARBIDE sealing faces. Stainless steel metal parts, BUNA-N elastomers.

Shaft: Corrosion-resistant stainless steel. Threaded design. Locknut on three phase models to guard against component damage on accidental reverse rotation.

Motor: Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.

Designed for Continuous Operation: Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage.

Bearings: Upper and lower heavy duty ball bearing construction.

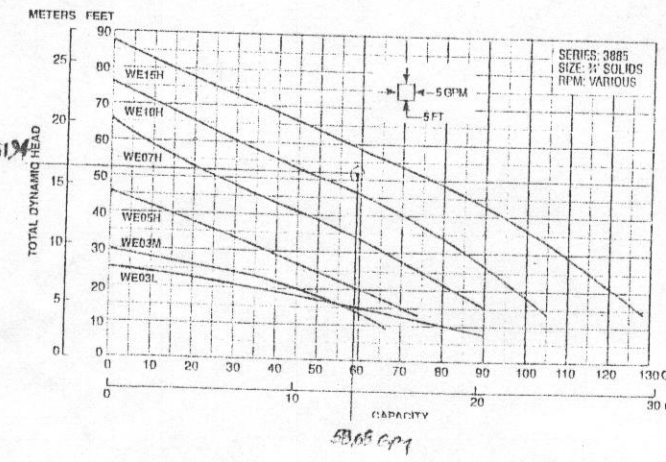
Power Cable: Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking.

O-ring: Assures positive sealing against contaminants and oil leakage.

AGENCY LISTINGS

Canadian Standards Association

Underwriters Laboratories

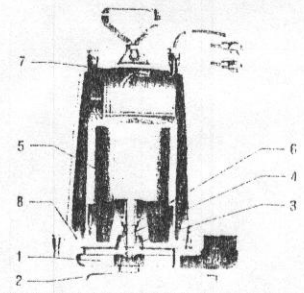


51%

5865 GPM

PARTS

Item No.	Description
1	Impeller
2	Casing
3	Mechanical seal
4	Shaft
5	Motor
6	Bearings – upper and lower
7	Power cable
8	O-ring



Goulds

Submersible Effluent Pump

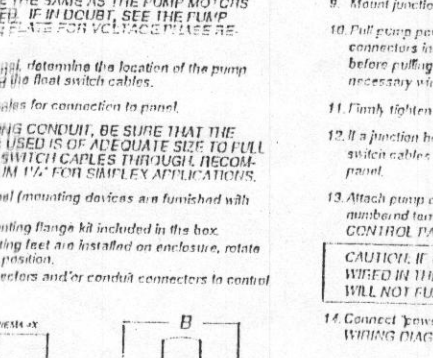
MODEL

3885

MODELS

Order No.	HP	Volts*	Phase	Max. Amp.	RPM	Sq Heater Size	Wt. (lbs.)
WE0311L	⅓	115	1	9.4	1750	N/A	56
WE0312L		230		4.7			
WE0318L		200		5.4			
WE0311M		115		9.4			
WE0312M		230		4.7			
WE0318M		200		5.4			
WE0511H	½	115	1	14.5	3500	N/A	60
WE0512H		230		7.3			
WE0518H		200		8.4			
WE0538H		200	3	3.9		K32	
WE0532H		230		3.4		K32	
WE0534H		460		1.7		K21	
WE0511HH	½	115	1	14.5	3500	N/A	60
WE0512HH		230		7.3			
WE0518HH		200		8.4			
WE0538HH		200	3	3.8		K32	
WE0532HH		230		3.3		K31	
WE0534HH		460		1.65		K21	
WE0712H	¾	230	1	10.0	3500	N/A	70
WE0718H		200		11.5			
WE0738H		200	3	5.2		K49	
WE0732H		230		5.4		K39	
WE0734H		460		2.7		K28	
WE1012H	1	230	1	12.5	3500	N/A	70
WE1018H		200		14.4			
WE1038H		200	3	8.1		K43	
WE1032H		230		7.0		K43	
WE1034H		460		3.5		K32	
WE1512H	1½	230	1	15.7	3500	N/A	80
WE1538H		200	3	10.6		K53	
WE1532H		230		9.2		K50	
WE1534H		460		4.6		K36	
WE1512HH	1½	230	1	15.0	3500	N/A	80
WE1538HH		200	3	10.6		K53	
WE1532HH		230		9.2		K50	
WE1534HH		460		4.6		K36	

* For 575 V consult factory.

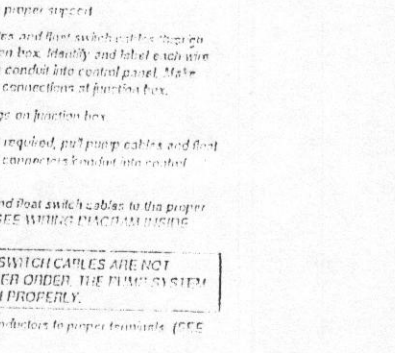


PERFORMANCE RATINGS (gallons per minute)

Total Head Feet of Water	Order No.	WE0311L WE0312L WE0318L	WE0311M WE0312M WE0318M	WE0511H WE0512H WE0538H WE0532H WE0534H WE0511HH	WE0712H WE0738H WE0732H WE0734H	WE1012H WE1038H WE1032H WE1034H	WE1512H WE1538H WE1532H	WE0511HH WE0512HH WE0538HH WE0532HH WE0534HH WE1512HH	WE1512HH WE1538HH WE1532HH WE1534HH
	HP	½	½	½	¾	1	1½	½	1½
	RPM	1750	1750	3500	3500	3500	3500	3500	3500
5		–	–	–	–	–	–	60	–
10		80	65	–	–	–	–	56	84
15		60	57	69	90	104	128	53	82
20		36	45	60	83	98	122	48	77
25			25	50	76	92	116	45	75
30				38	67	85	109	40	72
35				26	58	78	102	35	70
40				15	47	70	94	30	67
45					36	62	86	25	64
50					25	52	77	18	60
55					17	42	67	12	58
60					8	32	56	3	54
65						21	46		51
70						11	35		47
75							25		43
80							15		40
90									33
100									24
110									15
120									5

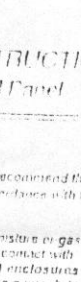
DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)
0.5 HP, ¾, ¾ and 1 HP = 15
except for model WE0712H and WE1012H = 18"; 1½ HP = 18



EFFLUENT EJECTOR SYSTEM

Effluent ejector system offers ease of ordering and installation. A single ordering number specifies a complete system designed for most residential and commercial sump and effluent pump applications.



Package Includes:
Submersible Effluent Pump WE0311L, 12L or WE0511M, 12M, WE0511HH, 17
Mechanical Level Control Switch
A2-5 (115V), A2-6 (230V)
Base A7-10115, Brass Check A8-1012
Check Valve A9-20
Order No: SWE0311L, SWE0312L
SWE0311M, SWE0312M

OFFER IT: 1121W104H + OPTIONS 8A, 8C, 10E (Counter, EV Timer, Locking Lid)

MODEL 112 control panels

Single-phase, simplex motor contactor control. (230V, Single Ph

outdoor model shown

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

Model Shown 1121W114X

- A1 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).
- A2 Magnetic Motor Contactor controls pump by switching both electrical lines
- A3 HOA Switch for manual pump control
- A4 Green Pump Run Indicator Light
- A5 Float Switch Terminal Block (3 float system)
- A6 Control ON/OFF Switch
- A7 Control and Alarm Fuses
- A8 Circuit Breaker (optional) provides pump disconnect (not shown)
- A9 Input Power Terminal Block
- A10 Ground Lug

SEE/SEE/HIGH WATER ALARM

NOTE: SEPARATE 120V CKT (SQUARE) REQ'D FOR ALARM

ALARM PACKAGE (OPTIONAL) ✓

- A11 Red Alarm Beacon provides 360° visual check of alarm condition
- A12 Alarm Horn provides audio warning of alarm condition (83 to 85 decibel rating)
- A13 Exterior Horn Silence Switch allows alarm horn to be silenced
- A14 Horn Silence Relay automatically resets alarm after alarm condition has been resolved
- A15 Exterior Alarm Test Switch allows for testing of horn and light to ensure proper operation of alarm system

SIE Rhombus CONTROLS

rhombus™ TECHNOLOGY

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 running 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 PHASES 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 1¼" FOR SIMPLEX APPLICATIONS.
5. *Mount control panel (mounting devices are furnished with control panel)*
   a. *NEMA 4X, mounting flange kit included in this 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/conduit 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	9⅞"	9⅞"
B	6¼"	6"
C	12⅛"	11⅞"
D	7⅛"	5⅞"
E	10½"	13⅜"
F	11⅞"	10⅞"

James Oyekan
7145 Brooks Rd, Highland

Sheet Title:
WASTEWATER SYSTEM PLAN

Sheet #
9 of 13 Shee

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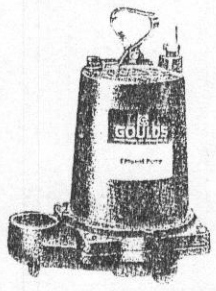
Scale: 1" = '

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, Principa



Goulds

Submersible Effluent Pump

MODEL

3885

APPLICATIONS

Specifically designed for the following uses:
- Homes
- Farms
- Trailer courts
- Motels
- Schools
- Hospitals
- Industry
- Effluent systems

SPECIFICATIONS

Pump
- Solids handling capabilities: ¾" maximum.
- Discharge size: 2" NPT.
- Capacities: up to 128 GPM.
- Total heads: up to 123 feet TDH.
- Mechanical seal: silicon carbide-rotary seat/silicon carbide-stationary seat, 300 series stainless steel metal parts, BUNA-N elastomers.
- Temperature: 104°F (40°C) continuous 140°F (60°C) intermittent.
- Fasteners: 300 series stainless steel.
- Capable of running dry without damage to components.

Motor

Single phase:
- ⅓ HP, 115 V, 200 V, 230 V, 60 Hz, 1750 RPM; ½ HP, 115 V, 60 Hz, 3500 RPM; ½ HP – 1½ HP, 230 V, 60 Hz, 3500 RPM.
- Built-in overload with automatic reset.
- Class B insulation.

Three phase:
- ½ HP – 1½ HP 200/230/460 V, 60 Hz, 3500 RPM.
- Class B insulation.
- Overload protection must be provided in starter unit.
- Shaft: threaded, 400 series stainless steel.
- Bearings: ball bearings upper and lower.
- Power cord: 20 foot standard length (optional lengths available).

Single phase:
- ⅓ and ½ HP – 16/3 SJTO with 115 V or 230 V three prong plug.
- ¾-1½ HP – 14/3 STO with bare leads.

Three phase:
- ½-1½ HP – 14/4 STO with bare leads. On CSA listed models – 20 foot length SJTW and STW are standard.

FEATURES

Impeller: Cast iron, semi-open, non-clog with pump-out vanes for mechanical seal protection. Balanced for smooth operation. Silicon bronze impeller available as an option.

Casing: Cast iron volute type for maximum efficiency. 2" NPT discharge adaptable for slide rail systems.

Mechanical Seal: SILICON CARBIDE VS. SILICON CARBIDE sealing faces. Stainless steel metal parts, BUNA-N elastomers.

Shaft: Corrosion-resistant stainless steel. Threaded design. Locknut on three phase models to guard against component damage on accidental reverse rotation.

Motor: Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.

Designed for Continuous Operation: Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage.

Bearings: Upper and lower heavy duty ball bearing construction.

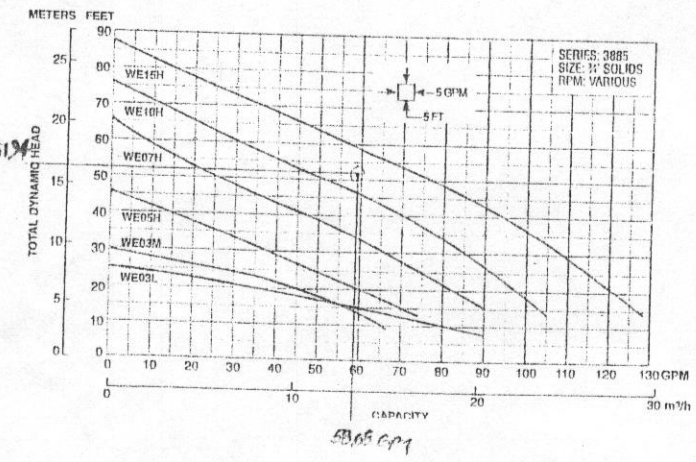
Power Cable: Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking.

O-ring: Assures positive sealing against contaminants and oil leakage.

AGENCY LISTINGS

Canadian Standards Association

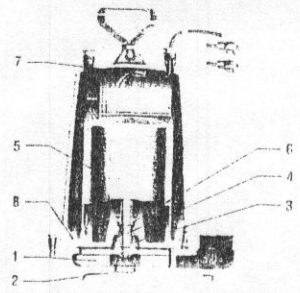
Underwriters Laboratories



5865 GPM

PARTS

Item No.	Description
1	Impeller
2	Casing
3	Mechanical seal
4	Shaft
5	Motor
6	Bearings – upper and lower
7	Power cable
8	O-ring



Goulds

Submersible Effluent Pump

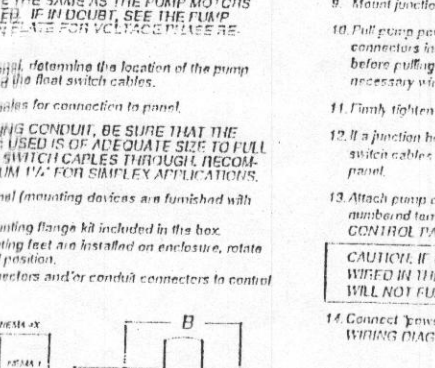
MODEL

3885

MODELS

Order No.	HP	Volts*	Phase	Max. Amp.	RPM	Sw Heater Size	Wt. (lbs.)
WE0311L	⅓	115	1	9.4	1750	N/A	56
WE0312L		230		4.7			
WE0318L		200		5.4			
WE0311M		115		9.4			
WE0312M		230		4.7			
WE0318M		200		5.4			
WE0511H	½	115	1	14.5		N/A	60
WE0512H		230		7.3			
WE0518H		200		8.4			
WE0530H		200	3	3.9		K32	
WE0532H		230		3.4		K32	
WE0534H		460		1.7		K21	
WE0511HH	½	115	1	14.5		N/A	60
WE0512HH		230		7.3			
WE0518HH		200		8.4			
WE0538HH		200	3	3.8		K32	
WE0532HH		230		3.3		K31	
WE0534HH		460		1.65		K21	
WE0712H	¾	230	1	10.0	3500	N/A	70
WE0718H		200		11.5			
WE0738H		200	3	5.2		K48	
WE0732H		230		5.4		K36	
WE0734H		460		2.7		K28	
WE1012H	1	230	1	12.5		N/A	70
WE1018H		200		14.4			
WE1038H		200	3	8.1		K43	
WE1032H		230		7.0		K43	
WE1034H		460		3.5		K32	
WE1512H	1½	230	1	15.7		N/A	80
WE1538H		200	3	10.6		K53	
WE1532H		230		9.2		K50	
WE1534H		460		4.6		K36	

* For 575 V consult factory.



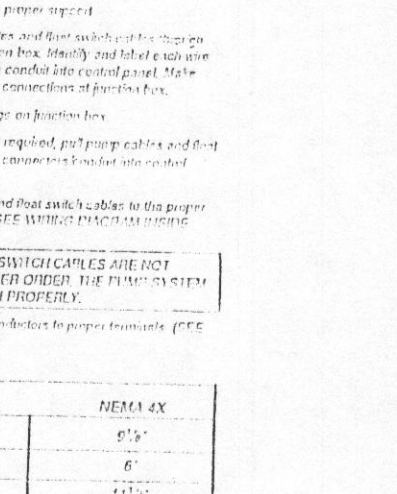
GOULDS PUMPS

PERFORMANCE RATINGS (gallons per minute)

Order No.		WE0311L WE0312L WE0318L	WE0311M WE0312M WE0318M	WE0511H WE0512H WE0538H WE0532H WE0534H WE0511HH	WE0712H WE0738H WE0732H WE0734H WE0712HH	WE1012H WE1038H WE1032H WE1034H WE1012HH	WE1512H WE1538H WE1532H WE1534H	WE0511HH WE0512HH WE0538HH WE0532HH WE0534HH WE0511HH	WE1512HH WE1538HH WE1532HH WE1534HH WE1512HH
	HP	½	½	½	¾	1	1½	½	1½
	RPM	1750	1750	3500	3500	3500	3500	3500	3500
Total Head Feet of Water	5	–	–	–	–	–	–	60	–
	10	80	65	–	–	–	–	56	84
	15	60	57	69	90	104	128	53	82
	20	36	45	60	83	96	122	48	77
	25		25	50	76	92	116	45	75
	30			38	67	85	109	40	72
	35			26	58	78	102	35	70
	40			15	47	70	96	30	67
	45				36	62	86	25	64
	50				25	52	77	18	60
	55				17	42	67	12	58
	60				8	32	56	3	54
	65					21	46		51
	70					11	35		47
	75						25		43
	80						15		40
	90								33
	100								24
	110								15
	120								5

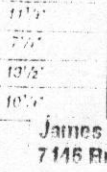
DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)
⅓, ½, ¾ and 1 HP = 15
except for model WE0712H and WE1012H = 18"; 1½ HP = 18



EFFLUENT EJECTOR SYSTEM

Effluent ejector system offers ease of ordering and installation. A single ordering number specifies a complete system designed for most residential and commercial sump and effluent pump applications.



Package Includes:
Submersible Effluent Pump WE0311L, 12L or WE0311M, 12M, WE0511HH, 12 Mechanical Level Control Switch
A2-5 (115V), A2-6 (230V)
Basin A2-18115, Basin Cover A2-1812
Check Valve A6-20
Order No: SWE0311L, SWE0312L, SWE0311M, SWE0312M

ORDER #: 1121W104H + OPTIONS 8A, 8C, 10E (COUNTER, EV FLOAT, LEADING LOW)

MODEL 112 control panels

Single-phase, simplex motor contactor control. (230V, SINGLE PH

outdoor model shown

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

Model Shown 1121W114X

A1 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).

A2 Magnetic Motor Contactor controls pump by switching both electrical lines

A3 HOA Switch for manual pump control

A4 Green Pump Run Indicator Light

A5 Float Switch Terminal Block (3 FLOAT SYSTEM)

A6 Control ON/OFF Switch

A7 Control and Alarm Fuses

A8 Circuit Breaker (optional) provides pump disconnect (not shown)

A9 Input Power Terminal Block

A10 Ground Lug

NOTE: SEPARATE 120V CKT (SOLIDAE) REQ'D FOR ALARM

ALARM PACKAGE (OPTIONAL) ✓

A11 Red Alarm Beacon provides 360° visual check of alarm condition

A12 Alarm Horn provides audio warning of alarm condition (83 to 85 decibel rating)

A13 Exterior Horn Silence Switch allows alarm horn to be silenced

Horn Silence Relay automatically resets alarm after alarm condition has been resolved.

A11 Exterior Alarm Test Switch allows for testing of horn and light to ensure proper operation of alarm system

SE Rhombus CONTROLS

rhombus™ TECHNOLOGY

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 running 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 PHASES 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 1¼" FOR SIMPLEX APPLICATIONS.
5. *Mount control panel (mounting devices are furnished with control panel)*
   a. *NEMA 4X, mounting flange kit included in this 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.*

	NEMA 1	NEMA 4X
A	9⅛"	9⅛"
B	6¼"	6"
C	12⅛"	11⅞"
D	7⅛"	7⅛"
E	10½"	13⅜"
F	11⅞"	10⅞"

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/conduit 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)*

James Oyekan
7145 Brooks Rd, Highland

Sheet Title:
WASTEWATER SYSTEM PLAN

Sheet #
9 WWTP
of 13 Sheets

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6/16/06

Scale: 1" = '

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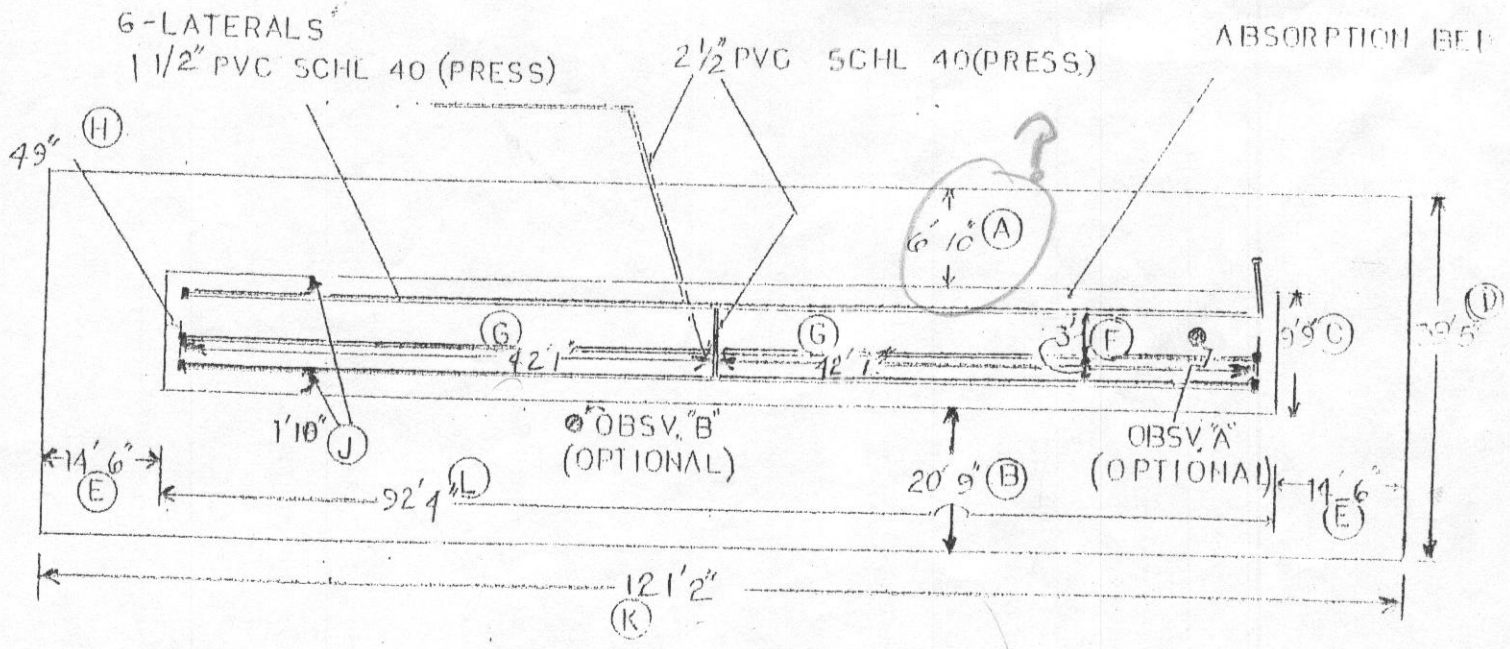
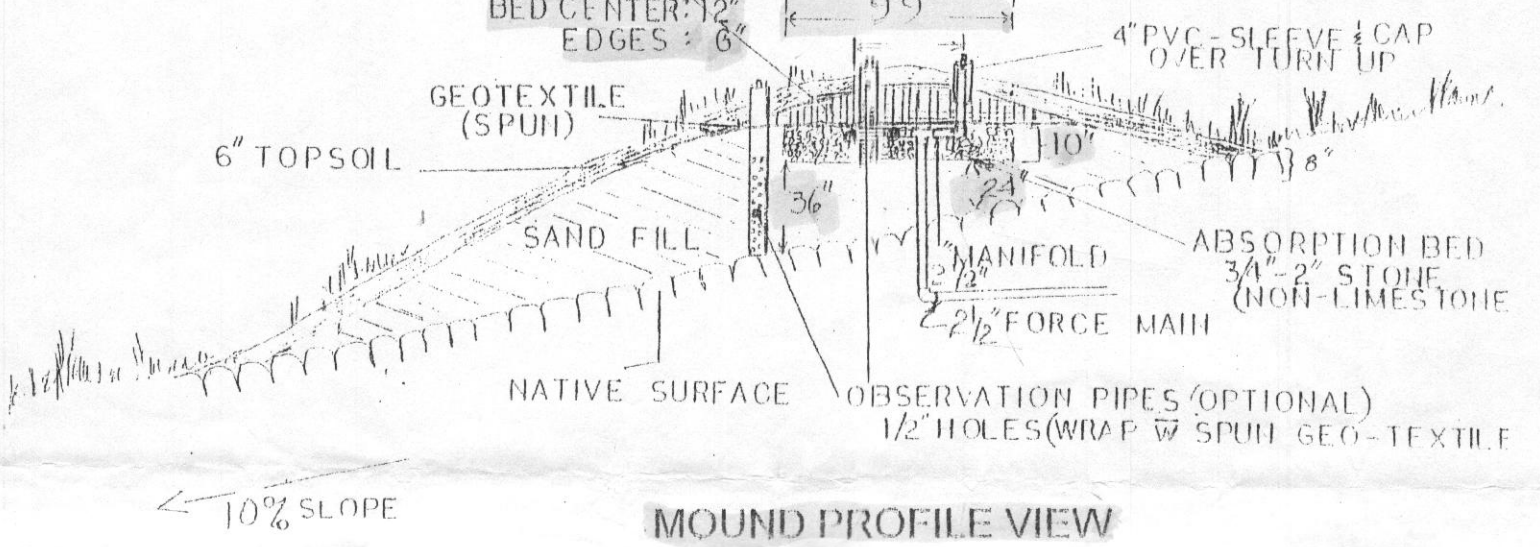
INNOVATIVE WASTEWATER TREATMENT SYSTEMS
P.O. BOX 363, NEW WINDSOR, MD 21776
(410) 875-9370 Office
(410) 635-2883 Fax
H. Dale Gray, Principa



MOUND PLAN VIEW

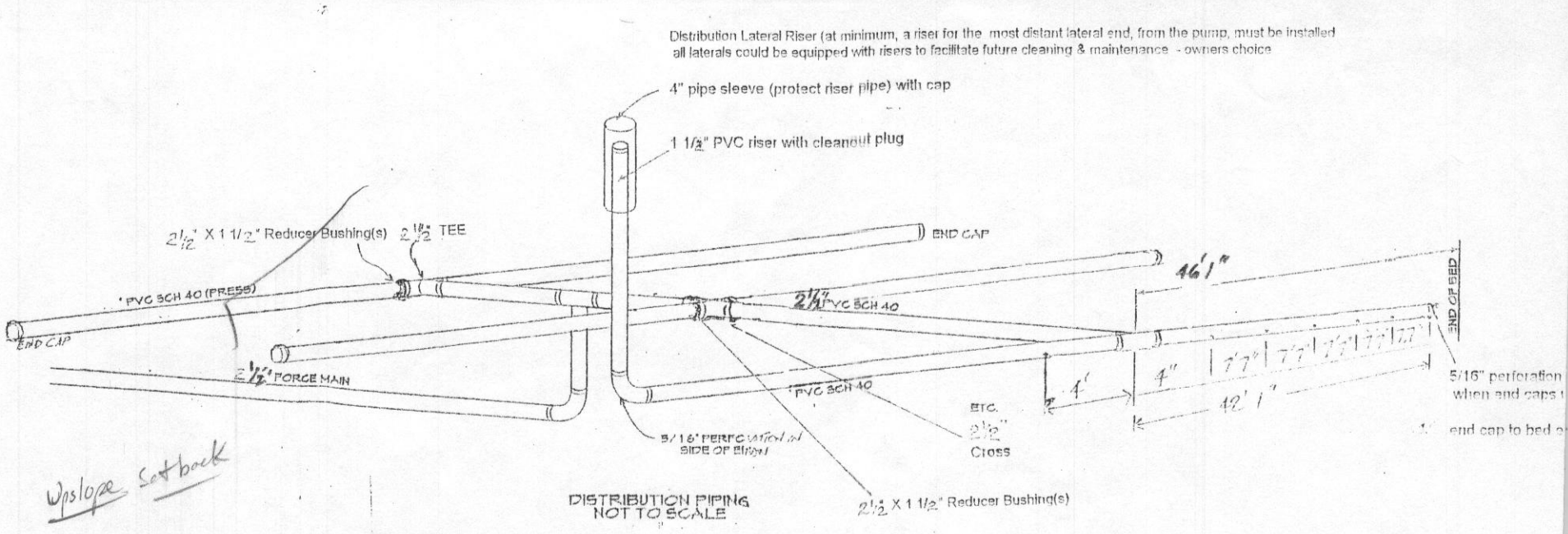
Scale as shown

A	UPSLOPE SETBACK	F	DISTRIBUTION LATERAL SEPARATION
B	DOWNSLOPE SETBACK	G	LATERAL LENGTH
C	ABSORPTION BED WIDTH	H	BED ENDS (PIPE) SETBACK
D	MOUND WIDTH	J	BED SIDES (PIPE) SETBACK
E	SIDESLOPE SETBACK	K	MOUND LENGTH
		L	ABSORPTION BED LENGTH



MOUND PROFILE VIEW

Scale as shown



DISTRIBUTION PIPING
NOT TO SCALE

Upslope Setback

$\therefore \left[24" + 22"\right] \times 3 \times (.77) = 106.26"$

$\sim 8.86'$ ✓

Downslope Setback

$\left[36" + 22"\right] \times 3 \times 1.44 = 250.56"$

$\sim 20.88'$ ✓

4

James Oyekan
7115 Brooks Rd, Highland M

Sheet Title:
WASTEWATER
SYSTEM
PLAN

Sheet #
10 of 13 Shee

WWT-

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6/16/06

1" =

CONSTRUCTION PROCEDURES

1 GENERAL

oper construction is extremely important if the sand mound is to function signed. Installation of a sand mound system is prohibited when soils are f nstruction of the mound should not occur if the soil is too wet. Compacti ddling of the soil in the location of the mound and downslope should be . il is too wet for construction of the mound if a sample, taken anywhere w per eight inches, when rolled between the hands forms a wire. If the samp imbles, the soil is dry enough for construction to proceed.

11-13

2 EQUIPMENT

e following special equipment is recommended:

1. A small track-type tractor with blade for placing and spreading the sa
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 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.

3. MATERIALS

ne 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.

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.

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.

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.

5.4. [illegible]

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.

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.

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

MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard • Baltimore MD 21230
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Robert L. Ehrlich, Jr.
Governor

Michael S. Steele
Lt. Governor

Kendl P. Philbrick
Acting Secretary

RECEIVED
SEP 10 2003
CARROLL COUNTY HEALTH DEPARTMENT
WESTMINSTER, MARYLAND

Memorandum:

TO: Environmental Health Directors

THRU: Jay Prager, Chief, On-Site Systems Division

FROM: Barry Glotfelty, Regional Consultant, On-Site Systems Division
Wastewater Permits Program

RE: Alternative Sand for Mounds

DATE: September 4, 2003

Contractors and some counties have experienced considerable difficulty in acquiring sand for use in sand mounds that consistently meets the specification from COMAR 26.04.02.05 Q (I) requiring an effective size of 0.25 – 0.5 mm with a uniformity coefficient ≤ 3.5. This has led us to explore whether sands with different qualities could be approved for use in Maryland mounds.

Recent research from the University of Wisconsin indicates that a sand with slightly different properties than those currently deemed suitable for use in Maryland also give acceptable performance in mounds. The State of Wisconsin's sand specification is included in the Wisconsin Mound Soil Absorption System: Siting, Design and Construction Manual, January 2000. The portions of the document that relate to sand specification are attached to this memo. The entire document, publication # 15-24, is available at the Small Scale Waste Management Project's website **www.wisc.edu/sswmp/publist.html**

Sand meeting the specification described in the Wisconsin manual can be accepted for use in Maryland mounds if all of the following conditions are met:

1. A recent sieve analysis should be included with the proposed sand indicating that the parameters of the Wisconsin specification are met including allowable percentages of particles less than 0.053 mm and greater than 2 mm (see figure 5).
2. The mound employing the sand must be classified as an alternative (non-conventional) system instead of a conventional mound. This is because the sand specification for use in a conventional mound is explicit in our regulation.
3. The design conditions included in the Wisconsin manual must be employed in the design of the mounds that use the alternative sand. These conditions include bed loading rates of 1.0 gpd/ft² or less, gravel beds less than 10 ft wide ensuring a linear loading rate of less than 10 gpd/ft., and effluent filters employed in the outlet of the second compartment of the two compartment septic tank used for pretreatment. Additionally, observation ports must be installed in the mound (see Maryland's 1993 Sand Mound Design and Construction Manual).

BG:je

Attachment

cc: J. James Dieter
Regional Consultants

James Oyekan
7145 Brooks Rd, Highland MD

Sheet Title:
WASTEWATER SYSTEM PLAN

Sheet#
11 WWT-1 of 13 Sheets

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