DESIGN OF ON-SITE SEWERAGE FACILITY

For

MARY LYNES & ROBIN PITBLADO
CLUB LANE
COLUMBUS, TEXAS
COLORADO COUNTY

March 25, 2003

PREPARED BY
WEISHUHN ENGINEERING, INC.
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STATE OF TEXAS
JAMES W. WEISHUHN
69128
REGISTERED
PROFESSIONAL ENGINEER

James W. Weishuhn
3/25/03

LYNESIb4LPD.doc

1. SITE EVALUATION

A site evaluation indicated the following subsurface conditions.

Parameter	Description	Suitable/Unsuitable[a]
Topography	3 % Slope	Suitable
Test Hole 1&2		
Topsoil Profile	0 to 36" below ground surface:	Suitable
	No Restrictive horizon; Gritty, No Ribbon,	
	No Ball; Tan Color, Class Ib Loamy Sand	
	36-42" below ground surface	Unsuitable
	Gray, ball, ribbons >2"	
	Class IV Clay	
Groundwater	No signs of seasonal groundwater	Suitable
Flood Hazard	Site is not within 100-year floodplain.	Suitable

[a] Relative to a standard system.

2. SYSTEM TYPE

A standard system is suitable for soil conditions, but the disposal area is uphill from the house. Therefore a low pressure dosing system will be designed to treat wastewater from a 3-bedroom home.

3. SYSTEM SIZE

For a single 3 bedroom home, less than 2,500 sf, the daily flowrate $(Q) = 240$ gal/day, with water saving devices; (per Table III of 30 TAC Chapter 285).

4. SEPTIC TANK SIZE

Septic Tank Volume = 750 gal. (per Table II, 30 TAC Chapter 285), for Q =240 gpd.

5. EFFLUENT APPLICATION RATE

Design application rate for the Class Ib soil. (Per Table I of 30 TAC Chapter 285, the application rate for a Class Ib soil is Ra = 0.38 gal/sf/day)

6. ABSORPTION AREA (AA)

AA = Q/Ra = 240 gpd/ 0.38 gal/sf/day = 632 sf

7. DISTRIBUTION PIPING

Per 30 TAC Chapter 285.33(d)(1)(C)(i)(I), if the media in the excavation is at least one foot deep, the length of the excavation = L = A / (w+2) where w=1 for excavations less than one foot wide: L = A/(w+2) = 632 sf / (1+2) = 211 sf
Provide a system with 240' of dosing system pipe to meet the minimum pipe length plus 29' contingency. Four 60' trenches at five foot spacing.

8. DETERMINE NUMBER OF HOLES AND FLOW RATE

Assume 5-foot hole spacing and 5/32" dia. holes operated at 2' of hydraulic head
Number of holes = 240 feet/ 5 feet / hole = 48 holes
Flow rate / hole = 0.41 gpm (Table 2 of Construction Standards for On-Site Sewerage
Facilities, Texas Department of Health, 1/1/90)
Total Flow Rate = 48 holes * 0.41 gpm/hole = 20 gpm

9. CALCULATE FRICTION LOSS

Compute Friction Head. Use 1½" dia. pipe for supply lines. From Table 3 for
Construction Standards for Onsite Sewerage Facilities, pipe friction loss per 100 feet of
PVC for 1½" dia. pipe flowing at 20 gpm is approximately 2.46 feet/ 100 feet of pipe.
Friction head = 1.2(pipe friction)
Friction head = 1.2 * 2.46/ 100' * 120 feet
Friction head = 3.5' Say 4'

10. COMPUTE ELEVATION HEAD

Elevation Head = 8' (water surface elevation difference between pipe's highest elevation
and pump tank lowest water surface elevation)
Low Pressure Head on System = 2'

11. COMPUTE TOTAL HEAD REQUIREMENTS

Total Head = H = Friction Head + Elevation Head + System Head
$\qquad\qquad$ = 4' + 8' + 2'
$\qquad\qquad$ = 14'
Pump Capacity = 20 gpm at 14' Total Dynamic Head

12. DOSING VOLUME

Calculate the minimum dosing volume using the following piping configuration:
$\qquad$ Supply Pipe Diameter: 1½" diameter
$\qquad$ Lateral Pipe Diameter: 1¼" diameter
Dosing Volume = Supply Pipe Volume + 5 * Lateral Volume (per Construction
Standards for On-Site Sewerage Facilities, Texas Department of Health, 1/1/90)
Supply Pipe Volume = 3.14/4 (d)^2 * (Pipe Length) * (7.48 gal / cubic foot)
$\qquad\qquad$ = 3.14/4 *(1.5/12)^2 * (120 feet) * (7.48)
$\qquad\qquad$ = 11 gal.
Lateral Volume = 3.14/4 *(d)^2 * (Pipe Length) * (7.48 gal/cubic foot)
Lateral Volume = 3.14/4 * (1.25/12)^2 * (240) * (7.48)
Lateral Volume = 15 gal.
Minimum Dose Volume = Supply Pipe Volume + 5 * Lateral Volume
Dose Volume = 11 gal. + 5 * 15 gal
$\qquad\qquad$ = 86 gal.

Check Valve is required because the application area is at a higher elevation than the pump tank.

13. DETERMINE THE NUMBER OF DOSES PER DAY

Doses = Q / Dose Volume
Doses = 240/86
Doses = 2.8

14. COMPUTE THE DEPTH OF EFFLUENT PUMPED PER DOSE

Dose volume = 86 gal.   Assume 4' dia. tank
Dose Depth = Dose Volume / Tank Area
Dose Depth = 86 $\frac{gal\ (1cf\ /\ 7.48\ gal)}{3.14/4\ (4^2)}$
Dose Depth = 0.9' or 11"

15. COMPUTE EMERGENCY VOLUME REQUIREMENTS

Emergency Volume = 1/3 of daily flow
Emergency Volume = 1/3 (240 gal.)
Emergency Volume = 80 gal.

Emergency Volume Depth = Emergency Volume / Tank Area
Emergency Volume Depth = 80 gal. (1 cf / 7.48 gal.) / ((3.14 / 4) *4²)
Emergency Volume Depth = 0.85' Say 10"

16. TRENCH DESIGN

- The trenches will be 6-inches wide and 12-inches deep.
- The spacing of the trenches will be 5-feet on center.
- The trenches will be backfilled with 12-inches of gravel 3/8" to 1" in size.
- Lateral piping will be placed 6-inches above the trench bottom.
- The gravel will be overlain with a geotextile fabric.
- The geotextile fabric will be overlain with 9-inches of topsoil (~ 40 CY).
- The trenches will be constructed in accordance with the drawings.

17. DISTRIBUTION PIPING

- Supply header will be constructed of 1 ½ inch Schedule 40 PVC.
- Lateral distribution lines will be constructed of 1 ¼ inch Schedule 40 PVC.

18. LOCATION OF SYSTEM COMPONENTS

- The septic tanks and pump tanks must be located greater than 5 feet from the residence foundation, and greater than 50 feet from water wells.

- The distribution laterals will be located greater than 5 feet from property lines, and greater than 100 feet from water wells.

19. CONSTRUCTION NOTES

- The drain field area will be graded so that rainwater does not stand or pond.
- A nylon rope shall be attached to the discharge pump and to the manway cover to aid in lifting the pump for maintenance or repair.
- The discharge pump will be installed with unions to allow for quick removal.
- Concrete tanks will be constructed in accordance with the requirements of ASTM C1227-93a.
- Level controls will be installed in the pump chamber to provide a discharge of a approximately 86 gal. per cycle.
- A high level alarm will be installed in the pumping tank on a separate electrical circuit from the discharge pump.

20. ADDITIONAL NOTES

The system has been designed in accordance with 30 TAC Chapter 285 - On-Site Sewage Facilities for the purposes of securing a permit for construction of the system for a 240-gallon per day flow and 140 mg/L BOD load. The Professional Engineer provides no process guarantee relative to system operation and performance. Water conservation is encouraged with all on-site systems.

SYSTEM SUMMARY TABLE

LOW PRESSURE DOSING SYSTEM SUMMARY

Daily wastewater flow	240 gal.
Primary septic tank size	500 gal.
Secondary septic tank size	300 gal.
Total septic tank capacity	800 gal.
Pumping tank size	500 gal.
Absorption area	632 square feet
Total length of laterals	240 feet
Lateral diameter	1.25 inch
Lateral configuration	4-60 foot lines
Supply line length	120 feet
Supply line diameter	1½ inches
Manifold placement	End
Hole size	5/32 inch
Hole spacing	5 feet c-c
Number of holes	48 holes
Flow per hole	0.41 gpm
Total flow	20 gpm
Elevation head	8 feet
Friction head	4 feet
Pressure head	2 feet
Total head	14 feet
Pump Requirements	20 gpm @ 14 feet of head
Storage volume in laterals	15 gallons
Storage volume in supply line	11 gallons
Total storage volume in line	26 gallons
Dosing volume	86 gallons
Dosing depth	11 inches
Emergency volume	80 gallons
Emergency depth	10 inches
Check Valve needed	yes
Pea Gravel Volume	6 CY
Fill Volume on top of Distribution Line	40 CY

FIGURES

CLUB LANE.

NOTES

1. ENTIRE PROPERTY LIMITS ARE NOT SHOWN.
2. PROPERTY LIMIT IS NOT SHOWN BUT IS ~ 60' FROM END OF DISTRIBUTION LINES.
3. PROPOSED WATER WELLS MUST BE 50' FROM SEPTIC TANKS & 100' FROM APP. AREA.

~140' N.T.S.

PROP. HOME.
(3 BDRM./
<2,500 S.F.)

4" SCH 40 PVC @ 1/8"/FT. SLOPE W/ 2-WAY CLEAN-OUT
500 GAL. SEPTIC TANK
300 GAL. SEPTIC TANK
500 GAL. SEPTIC PUMP TANK.

~100'-1½" SCH 40 PVC

5' MIN.

SLOPE 2%

CLASS Ib or II FILL EXTEND 5' BEYOND LIMITS of DISTRIBUTION LINES (9" DEPTH OVER LINES)

NOTE 2

60'-1¼" SCH 40 PVC W/ 5/32" Ø HOLES @ 5'C-C (TYP 4)

TURN-UP (TYP. 4)

TREE (TYP.)

SCALE: 1"=30'

FIGURE 1
SITE PLAN
CLUB LANE
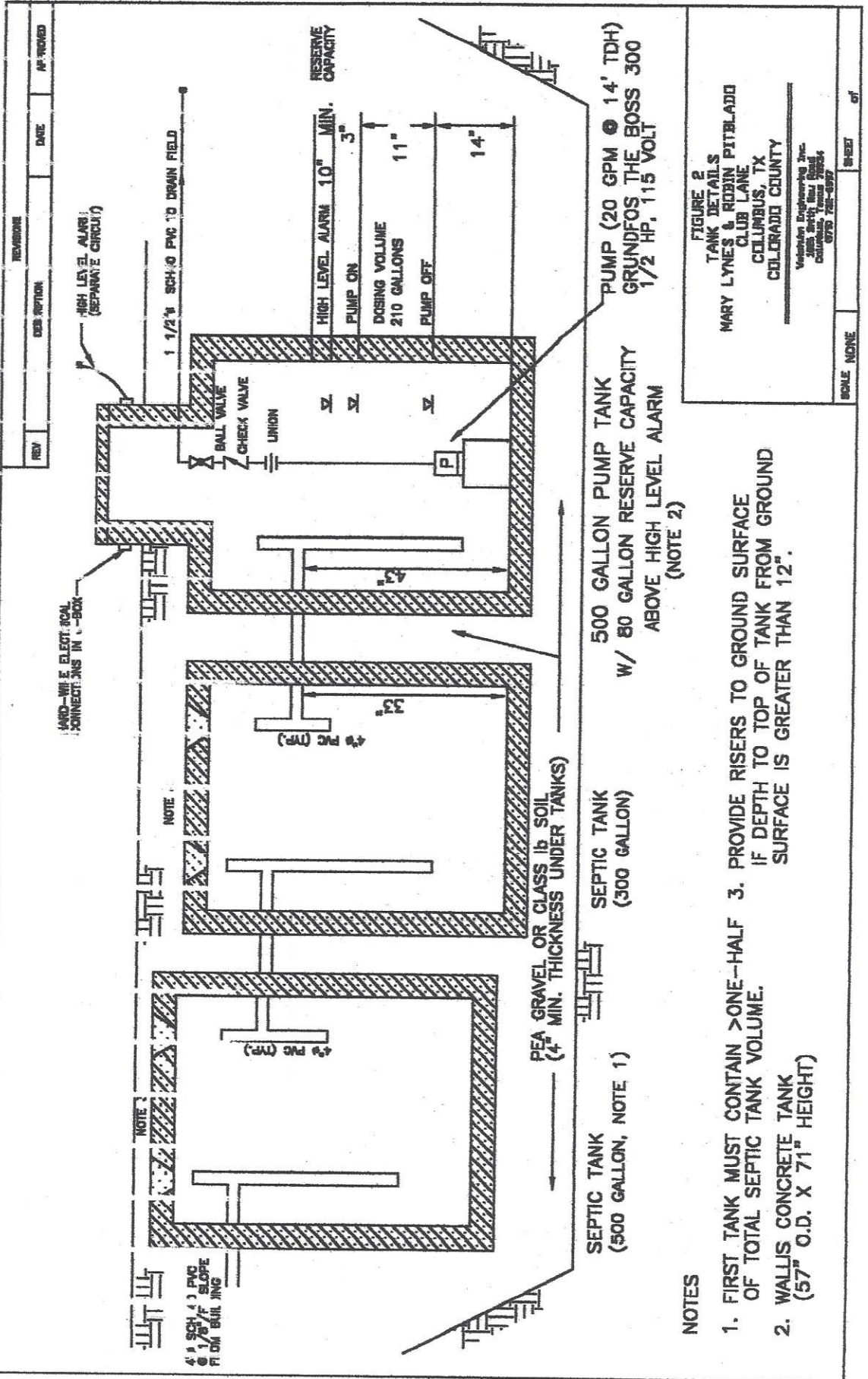SIMMONS LAKE SUB.
COLUMBUS, TX.

COLORADO COUNTY.

STATE OF TEXAS
JAMES W. WEISHUHN
69128
REGISTERED PROFESSIONAL ENGINEER

James W. Weishuhn 3/26/03

Figure 2 — Tank Details

STATE OF TEXAS — JAMES W. WEISHUHN — 69128 — REGISTERED PROFESSIONAL ENGINEER

James W. Weishuhn
3/25/03

REVISIONS
| REV | DESCRIPTION | DATE | APPROVED |

HIGH LEVEL ALARM (SEPARATE CIRCUIT)

1 1/2" SCH 40 PVC TO DRAIN FIELD

RESERVE CAPACITY

HIGH LEVEL ALARM   10" MIN.
3"
PUMP ON
DOSING VOLUME   11"
210 GALLONS
PUMP OFF   14"

PUMP (20 GPM @ 14' TDH)
GRUNDFOS THE BOSS 300
1/2 HP, 115 VOLT

BALL VALVE
CHECK VALVE
UNION

500 GALLON PUMP TANK
W/ 80 GALLON RESERVE CAPACITY
ABOVE HIGH LEVEL ALARM
(NOTE 2)

43"

33"

4" PVC (TYP.)

HARD-WIRE ELECTRICAL CONNECTIONS IN J-BOX

SEPTIC TANK
(300 GALLON)

NOTE 1

PEA GRAVEL OR CLASS Ib SOIL
(4" MIN. THICKNESS UNDER TANKS)

SEPTIC TANK
(500 GALLON, NOTE 1)

NOTE 1

4" PVC (TYP.)

4" SCH 40 PVC
@ 1/8"/F SLOPE
FROM BUILDING

WALLIS ENGINEERING INC.
Columbus, Texas 78934
(979) 732-8597

FIGURE 2
TANK DETAILS
MARY LYNES & ROBIN PITBLADO
CLUB LANE
COLUMBUS, TX
COLORADO COUNTY

SHEET   of

SCALE   NONE

NOTES

1. FIRST TANK MUST CONTAIN >ONE-HALF
   OF TOTAL SEPTIC TANK VOLUME.

2. WALLIS CONCRETE TANK
   (57" O.D. X 71" HEIGHT)

3. PROVIDE RISERS TO GROUND SURFACE
   IF DEPTH TO TOP OF TANK FROM GROUND
   SURFACE IS GREATER THAN 12".

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3/25/03

REVISIONS

REV	DESCRIPTION	DATE	APPROVED

NOTES:

1. INSTALL LATERALS IN 6' WIDE BY 18" DEEP TRENCHES PROVIDE 4' OF UNDISTURBED EARTH BETWEEN TRENCHES.

2. ALL PIPING IS SCH 40 PVC.

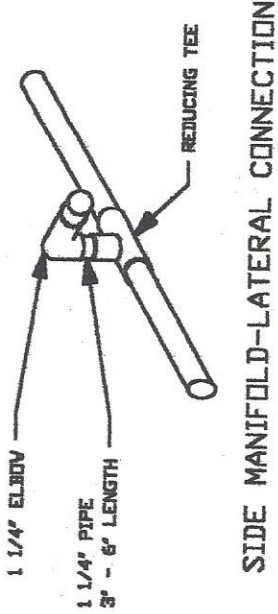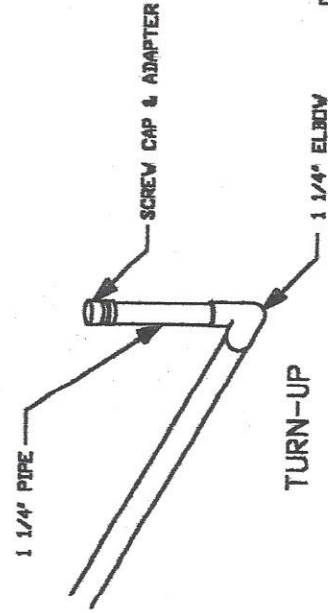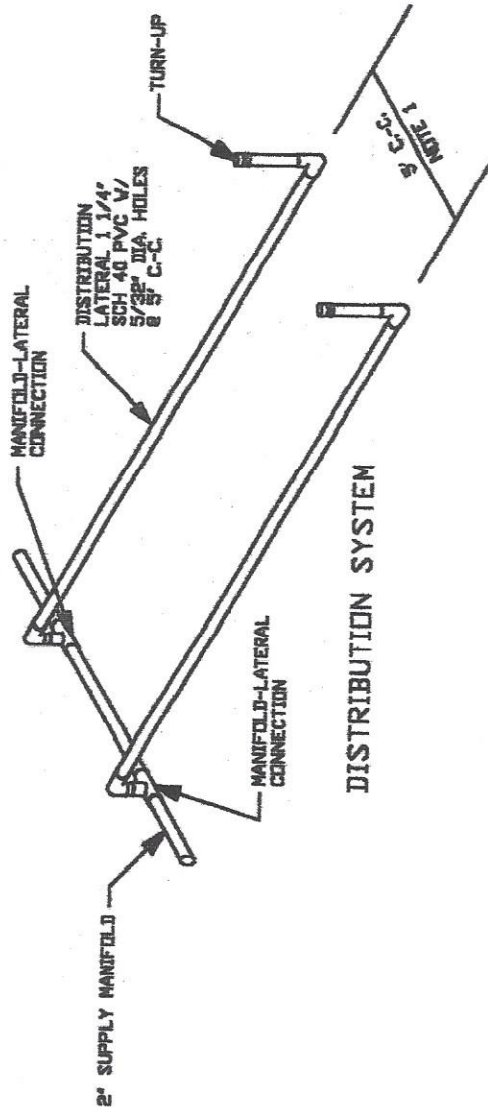**DISTRIBUTION SYSTEM**

TURN-UP

DISTRIBUTION LATERAL 1 1/4" SCH 40 PVC W/ 5/32" DIA HOLES @ 5' C-C.

@ 3'-3" & NOTE 1

MANIFOLD-LATERAL CONNECTION

MANIFOLD-LATERAL CONNECTION

2" SUPPLY MANIFOLD

TURN-UP

SCREW CAP & ADAPTER

1 1/4" ELBOW

1 1/4" PIPE

SIDE MANIFOLD-LATERAL CONNECTION

REDUCING TEE

1 1/4" ELBOW

1 1/4" PIPE 3" - 6" LENGTH

FIGURE 3
LOW PRESSURE DOSING SYSTEM
PIPING DETAILS
MARY LYNES & ROBIN PITBLADO
CLUB LANE, SIMMONS LAKE
COLUMBUS, TEXAS
COLORADO COUNTY

Weishuhn Engineering Inc.
1026 South Hmu Road
Columbus, Texas 78934
(979) 732-5847

SCALE NONE

SHEET   of

TURN-UP

1 1/4" DISTRIBUTION LATERAL

GRAVEL

EARTHEN DAM (PACKED SOIL)

BACKFILLED WITH SOIL

20'-0"

SUPPLY MANIFOLD
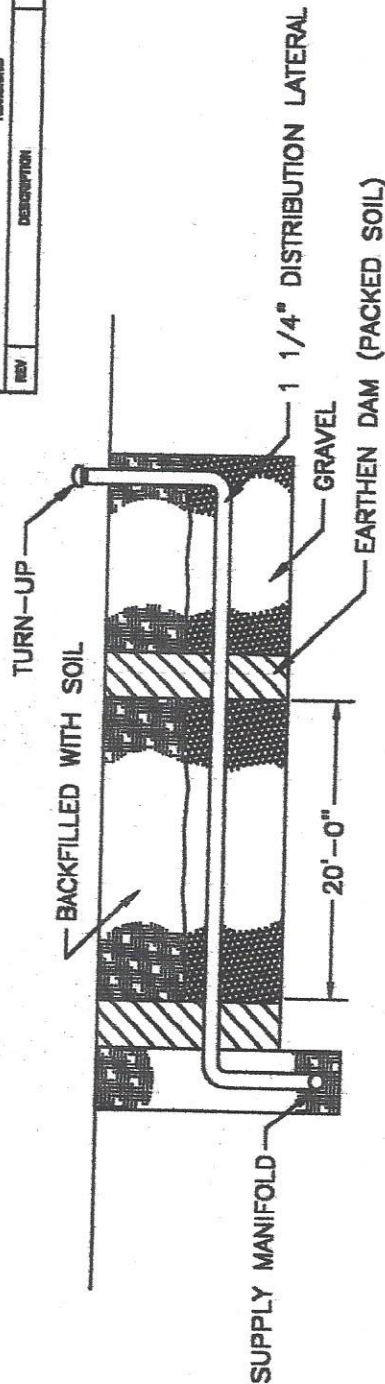
DETAILS OF ABSORPTION TRENCHES

GEOTEXTILE FABRIC

1 1/4" PVC WITH 5/32" HOLES
EVERY 5' FACING DOWN

BOTTOM OF TRENCH

NAT. GND.

SOIL BACKFILL
(SANDY MATERIAL—NO CLAY)

3/8" TO 1" GRAVEL

3/8" TO 1" GRAVEL

6"

12"

6"
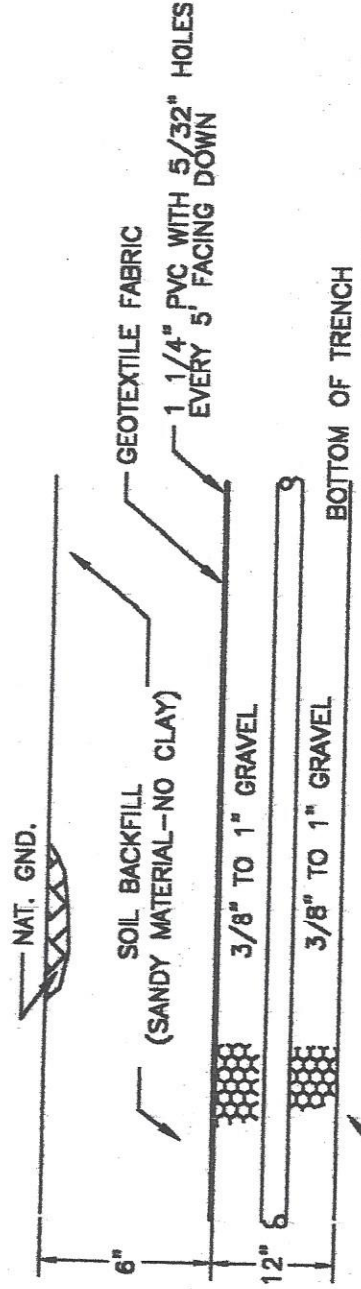
DRAIN FIELD CROSS SECTION

TRENCH BOTTOM MUST BE LEVEL TO 1" ON 25 FEET
OR WITHIN 3" ON TRENCH LENGTH

REV | DESCRIPTION | BY | DATE | APPROVED
REVISIONS

"The BOSS" Stainless Steel Sump Pump
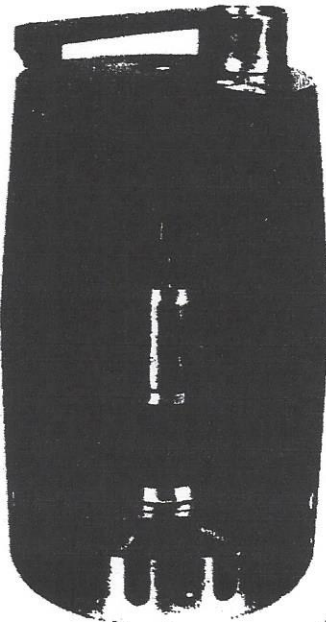
Features

☑ Sturdy stainless steel construction. Including motor, shaft, impeller and pump body.

☑ Water-lubricated motor never needs oiling.

☑ Hermetically sealed motor windings embedded in polyurethane-sealed in stainless steel so they will not short out.

☑ Reversible-replaceable wear plate for quick and easy service.

☑ Solid stainless steel discharge resists corrosion and cross-threading.

☑ Extra long-life bearings made of heavy-duty special carbon.

☑ Stainless steel *CutterVane*™ impeller resists fiber build-up, handles sand and solids up to ⅜ inch.

☑ Stainless steel suction screen protects impeller, prevents jamming.

Throttle pump to operate @ 20 gpm (handwritten note)

Performance Curves

"The BOSS" 1/2 HP
"The BOSS" 1/3 HP
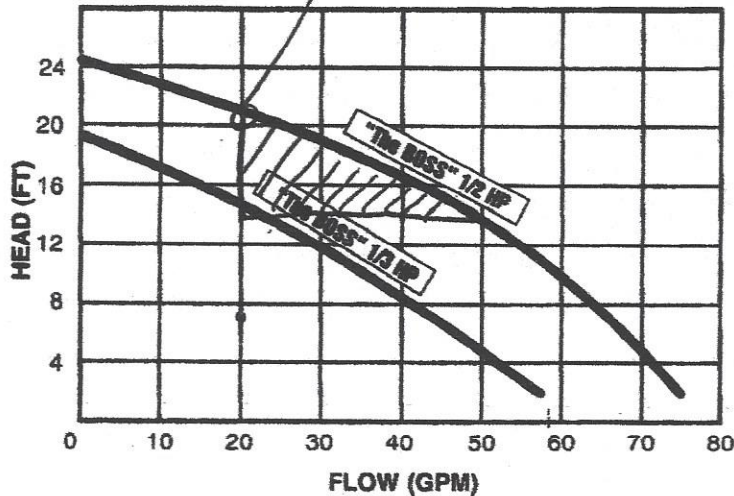
Technical Data

UL Listed, CSA Approved

FLOW RANGE: 0.5-75 U.S. GPM

TEMPERATURE RANGE:
32° - 95°F (0- 35C) Continuous
32° - 122°F (0-50C) Intermittent

(Totally submerged)

Min. Pumping Level: 1/2 Inch
Max. Solid Size: 3/8 Inch

Applications:

Use for:
Clear or dirty sump water
Grey water and waste water
Draining ponds, pits and tanks
De-Watering, Draining and filling tanks, Draining pools & spas
Light Chemical Mixing*

Do not use for:
Raw sewage
Flammables
Highly corrosive liquids

* Flush after use

Electrical Data and Dimensions

Model	HP	PH	Volts	Watts	Amps	Disc. Size	Shipping * Weight (Lbs.)	Shipping Vol.(Cu.ft.)
"The BOSS" 200	1/3	1	115	710	6.3	1¼	16	.5
"The BOSS" 300	1/2	1	115	920	9.0	1¼	17½	.5

*Not including float switch (1 ½ Lbs.)

Construction Materials

Stainless Steel:

AISI 304 S.S. Suction, Discharge and Intermediate Chambers, Impeller, Terminal Box Cover
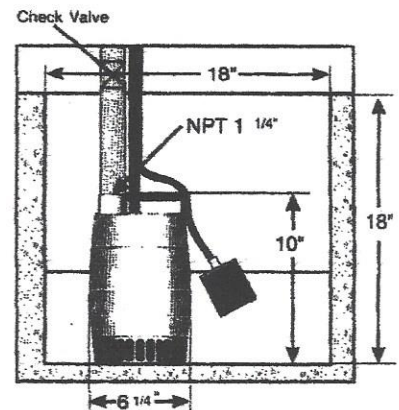
AISI 431 S.S. Shaft

Noryle : Wearplate, Terminal Box, Pump Handle

Compounded Carbon: Bearings

NBR: Seal Rings, O-Rings

Neoprene: Power Cord Jacket, Optional Switch Jacket

Dimensions/Installation

Check Valve
NPT 1 ¼"
18"
18"
10"
6 ¼"

Power cord length: 10 ft. and 25 ft. standard.
float switch length: 10ft. and 25ft. available.
18" sump size recommended for best operation of wide angle mercury float switch.

Noryl is a registered trademark of General Electric Company.

6-3

PROPERTY LEGAL DESCRIPTION AND PLAT

COLORADO COUNTY PERMIT APPLICATION

SITE EVALUATION FORM

COLORADO COUNTY
OSSF SOIL EVALUATION FORM (281) 381- 0653

Name _Mary Lynes & Robin Pittado_ 2034 Edendale

Address _Club Lane_ Katy, TX 77450

Evaluator _James Weishuhn_ Registration Number _P.E. 67128_

Dated _3/25/03_ Proposed Excavation Depth _12"_

~ least two soil evaluations must be performed on the site, at opposite ends of the proposed disposal area. Please ~w the results of each soil evaluation on a separate table. Locations of soil evaluations must be shown on the site ~ing.

~ subsurface disposal, soil evaluations must be performed to a depth of at least 2 ft. below the proposed ~avation depth. For surface disposal, the surface horizon must be evaluated.

~ e describe each soil horizon and identify any restrictive features in the space provided below. Draw lines at the ~ppriate depths.

SOIL EVALUATION

Number _TH 1 & TH 2_

Profile Depth	Soil Texture	Gravel Present	Restrictive Horizon
0 — Brown, will ribbons No, gritty	Class Ib Loamy Sand	No	No
36" —			
—18" gray, will ribbons >2"	Class IV	No	Yes

60 Inch Minimum Depth or to a restrictive horizon whichever is less

SOIL EVALUATION

Number

Profile Depth	Soil Texture	Gravel Present	Restrictive Horizon

60 Inch Minimum Depth or to a restrictive horizon whichever is less

~ \TURES: Sand/greater than 30% Gravel; Sand/30% or less Gravel; Sand; Loamy Sand; Sandy Loam; Loam; Silt; Silt Loam; Sandy Clay Loam; Clay Loam; Silty Clay Loam; Sandy Clay; Silty Clay; Clay.

~ RUCTURES: Massive; Blocky; Platy

COLORADO COUNTY
OSSF Soil Evaluation Form

TOPOGRAPHY

SLOPE: UNDER 2%_____ 2% to 30% _2%_ GREATER THAN 30%_____
Note: If slope is FLAT, provisions shall be made to insure good surface drainage of rainfall or runoff from covering the soil absorption field. Slopes greater than 30% are unsuitable.

VEGETATION: GRASS/BRUSH _✓_ LIGHTLY WOODED_____ HEAVILY WOODED_____

DRAINAGE: POOR_____ ADEQUATE _✓_ GOOD_____

GROUND WATER

Yes _✓_ No_____ Depth _36_ inches

FLOOD HAZARD

100 Year Floodplain_____ Floodway_____ Outside the 500 Year Floodplain _✓_

MINIMUM SEPARATION DISTANCES

Public Water Wells _N/A_
Private Water Well _50' tanks / 100' app. area_
Streams, Ponds, Lakes, Rivers _N/A_
Surface Improvements _5'_
Easements _5'_
Other Structures _5'_

Public Water Supply Lines _N/A_
Pressure Cemented or Grouted _N/A_
Foundations & Buildings _5'_
Property Lines _5'_
Swimming Pools _25'_
Sharp Slopes, Breaks _25'_

OTHER

TYPE OF SYSTEM REQUIRED: _Low Pressure Dose System 3 bdrm < 2500 sf
Install trenches to depth of 12" then place 6" over
Class Ib or II soil over application area_

NAME OF SITE EVALUATOR: _James W. Weishuhn_
REGISTRATION NUMBER: _P.E. 69128_
Seal if applicable

ADDRESS: 1026 Smith Rau Road
Columbus, Texas 78934

STATE OF TEXAS
JAMES W. WEISHUHN
69128
REGISTERED
PROFESSIONAL ENGINEER
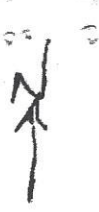
I certify that the above statements are true and are based on my own field observations.
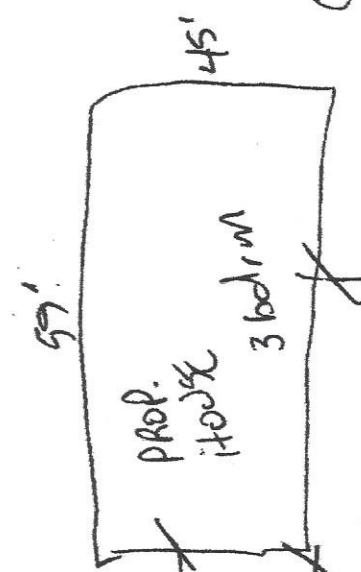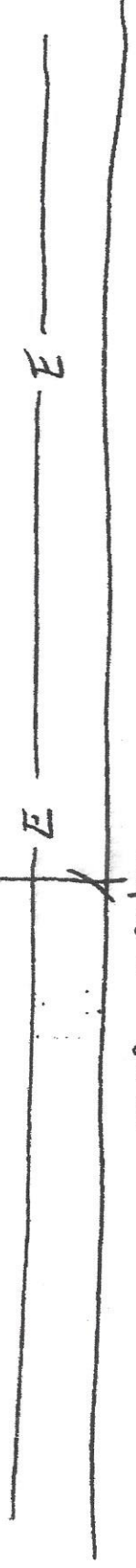Signature _James W. Weishuhn_ Date _3/24/03_

N

TREE LINE

SLOPE 2%

Lot # 6

E
E

CLUB DRIVE

45'

PROP. HOUSE
3 bdrm

59'

44 M

76 M

TH2

116'

PROP. APPLICATION AREA

TH1

30'

20'

512 742 454
BSH-742 515