LAYOUT 4/8/11 INSP 4 5/13/11

INSP 2 5/11/11 INSP 5 _____

INSP 3 5/12/11 INSP 6 _____

ISSUE DATE: _____ **SEPTIC REPAIR PERMIT** P _____

APPROVAL DATE: 5/31/11 (LPD System) A 534020

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

Farm and Home IS PERMITTED TO INSTALL ☒ ALTER ☐

ADDRESS: 901 Driver Road, Marriottsville, MD 21104 PHONE NUMBER: 410-984-0189

SUBDIVISION _____ LOT _____

ADDRESS: 7429 Mink Hollow Road PROPERTY OWNER: Alexander Dunbar

SEPTIC TANK CAPACITY (GALLONS): EX

PUMP CHAMBER CAPACITY (GALLONS): 1500 **Top Seamed**

LPD Distribution System – refer to design plans

TRENCHES:	Trenches to be 2 feet wide. Inlet 2 feet below original grade. Bottom maximum depth 7 feet below grade. 4 feet of stone below distribution pipe w/ 1 feet of sand mound sand.
LOCATION:	Trench locations staked at the site. Must be verified at time of Layout. Pump tank will be installed following ex. s.t. Keep tank on high side of swale.
NOTES:	Call for layout inspection prior to beginning construction. Washed ¾" gravel must be used. Trenches are to have 1 foot of sand mound sand at the bottoms. Follow approved plans for system design.

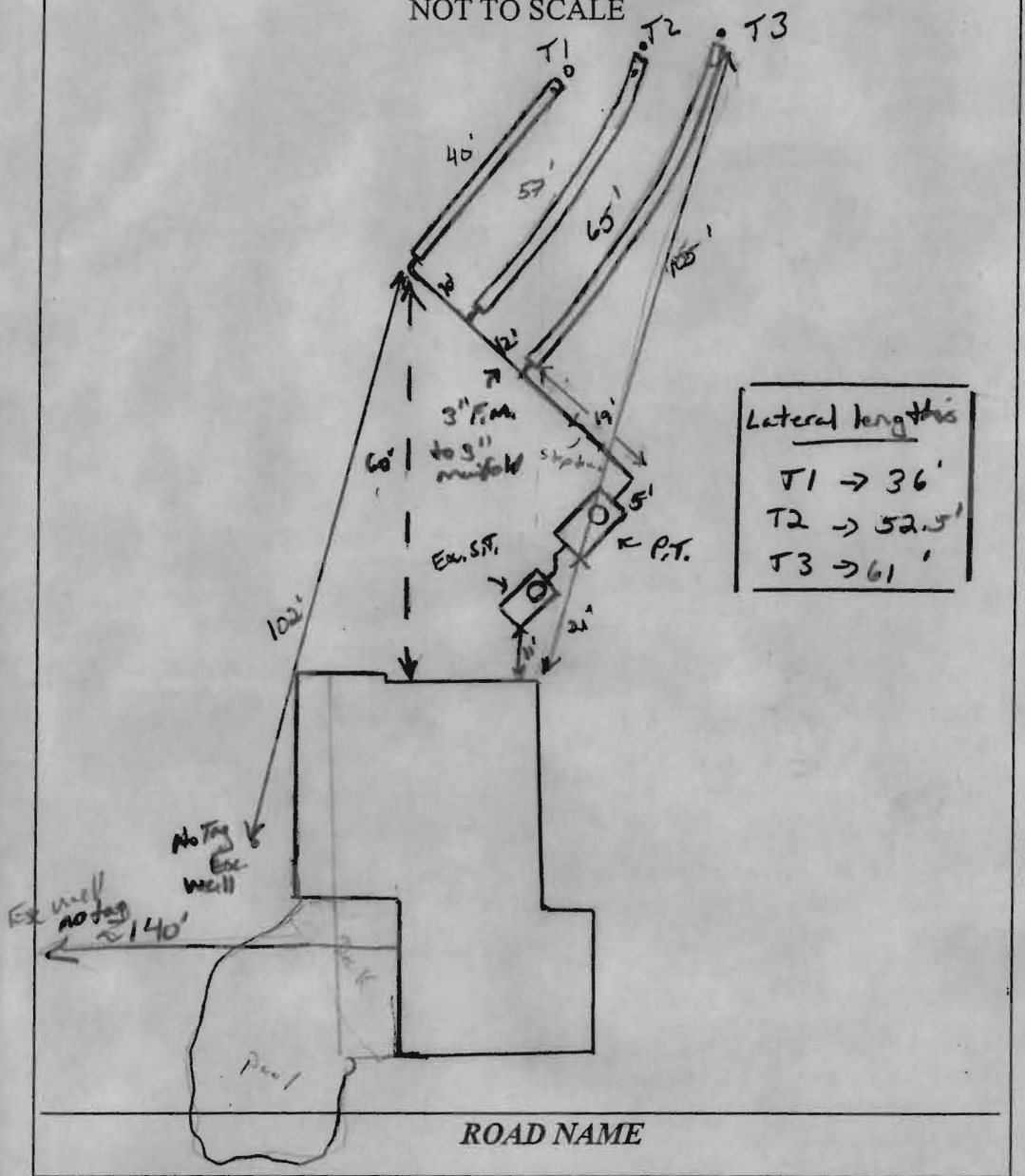
**Design is for 4 bedrooms. Future repair may require pre-treatment and abandoning one of two wells to expand area for the OSDS.*

PLANS APPROVED: K. Wolf DATE: 2/22/2011

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 SYSTMEM SHALL BE 100 FEET FROM ANY WATER WELL UNLESS SPECIFIED OTHERWISE
NOTE: MANHOLE RISERS REQUIRED ON ALL SEPTIC TANKS AND PUMP CHAMBERS
NOTE: AN ELECTRICAL PERMIT IS REQUIRED FOR INSTALLATION OF ANY ELECTRICAL COMPONENTS OF THE SYSTEM

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 INSPECTIONS

NOT TO SCALE



Lateral lengths
T1 → 36'
T2 → 52.5'
T3 → 61'

TRENCH/DRAINFIELD DATA

WIDTH	INLET	BOTTOM
2'	2	4'

NUMBER OF TRENCHES 3
TOTAL LENGTH
ABSORPTION AREA
~~DISTRIBUTION BOX LEVEL~~
~~DISTRIBUTION BOX BAFFLE~~
~~DISTRIBUTION BOX PORT~~

3" manifold

SEPTIC TANK DATA

SEPTIC TANK 1 LEVEL Yes
MANUFACTURER —
CAPACITY 1250 GAL
SEAM LOC mid
TANK LID DEPTH 2.5'
BAFFLES Yes (Terracotta)
BAFFLE FILTER —
MANHOLE LOC Rear
6" PORT LOC Front
WATERTIGHT TEST
SLOTTED no
DATE ON LID N/A
PUMP/SEPTIC TANK LEVEL Yes
MANUFACTURER Babylon
CAPACITY 1500 GAL
SEAM LOC Top
TANK LID DEPTH 3'
BAFFLES Front
BAFFLE FILTER —
MANHOLE LOC Rear
6" PORT LOC none
WATERTIGHT TEST —
SLOTTED no
DATE ON LID 2-17-11

PRE-CONSTRUCTION:
4/8/11 Layout given. Confirmed tank locations, trench locations and F.M. locations. Must use clean stone. Sieve analysis must be submitted to HD prior to use. Call when starting installation (KW)

5/11/11 S.T. hole being dug nothing else completed (EG)

INSTALLATION: 5/12/11 Pump tank set. Installing pump. Top 2 trenches being installed. F.M. installed. Told contractor to add obs. pipe @ ends of all trenches. OK to continue (KW)
5/13/11 P/A test successful! Need riser on tank. Distal heads in T1 was 44", T2 was 30", T3 was 24". Ball valve used divided back - 'by pass according to contractor. 5/31/11 Risers on tanks are backfilled. looks OK. All turn-ups and ports left above final grade. OK to cover all work. See system design for details

FINAL INSPECTOR J. Wolf. DATE OF APPROVAL 5/31/11

Design Spec's for 7429 Mink Hollow Rd.

4 Bedrooms
Design Flow => 600gpd

* Use Existing S.T. and 4" gravity Sewer

Ex. Septic Tank: Outlet Inv of S.T. = 44" below grade (133")

New Pump Tank: (1500g)
Elev. Pump OFF = 14.5 ft
Pump Chamber size = 1500g

Pump
Liberty ½ HP
FL 50

Trenches:
T1 (Highest) = 2ft wide
T2
T3 (lowest)
Inlet 2ft below grade
Bottom 7ft w/
1' sand mound sand.

Force main and manifold:
50ft of 3" F.m. + manifold
5 x 90° bends
2 x "Tee's"
1 x Union (quick-Disconnect)

Laterals:
Lateral 1 Elev = 2.46 ft
Lateral 2 Elev = 3.83 ft
Lateral 3 Elev = 4.25 ft

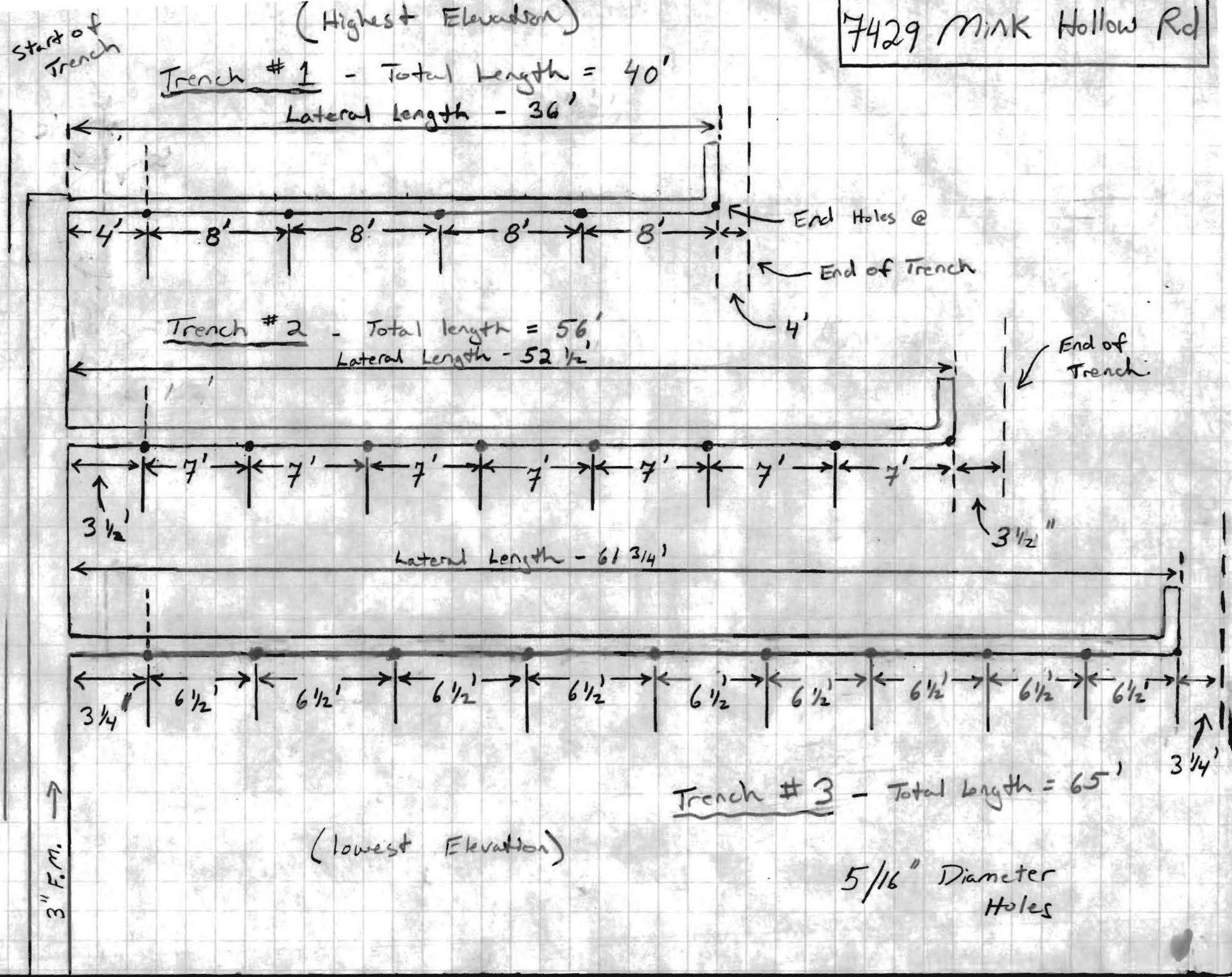
	Lateral 1	Lateral 2	Lateral 3
Lateral Length =	36.00 ft	52.50 ft	61.75 ft
Lateral Diameter =	1.5 in	1.5 in	1.5 in
# of Holes =	5	8	10
Hole Diameter =	5/16 in	5/16 in	5/16 in
Hole Spacing =	8.0 ft	7.0 ft	6.5 ft

Pump Design: TDH = 17.983 ft for 5ft of Distal Head @ highest lateral Elev.
Flow = 61 gpm
Static Head = 12.1 ft
Dose = 104.2g
Friction = .883 ft

Q = 2.6 gpm for 5/16" holes

Note: Ball valve will probably need to be used.

7429 Mink Hollow Rd



LAUREL SAND & GRAVEL, INC. T/A
S.W. Barrick & Sons

Barrick Quarry
Address: P.O. Box 86
Woodsboro, MD 21798
Sales Office: (301) 845-6341
Fax Number: (301) 845-2396
Orders & Dispatch: (301) 845-6343
Toll Free: (800) 846-6343

Finksburg Terminal
Address: 2700 Emory Road
Finksburg, MD 21048
Sales/Dispatch: (410) 833-4400
Fax Number: (410) 833-4909

April 20, 2011

Farm & Home Excavating, Inc.
901 Driver Road
Marriottsville, MD 21104

Attn: Bill Ingram

Re: Material Certification
Sand Mound Sand

Gentlemen:

This letter certifies that the Sand Mound Sand (natural washed Concrete Sand), shipped by S.W. Barrick & Sons through our Woodsboro facility, meets the material specifications for ASTM C-33, the Maryland Department of Transportation – State Highway Administration – Standard Specifications For Construction And Materials – Section 901, and the requirements for the "Wisconsin Mound Soil Absorption System: Siting, Design, and Construction Manual, January 2000.

The following sieve analysis is an average gradation of our Sand Mound Sand.

Sieve Size	Percent Passing	ASTM C-33 Specifications
3/8"	100.0	100
No. 4	98.8	95-100
No. 8	87.2	80-100
No. 16	67.3	50-85
No. 30	46.6	25.60
No. 50	8.8	5-30
No. 100	1.9	0-10
No. 200	0.6	

OK * SPECIFICATION REQUIREMENTS
Uniformity Coefficient (CU) = 2.83 — UNIFORMITY COEFFICIENT ≤ 3.5
Effective Size = 0.31 mm OK *EFF. PARTICLE SIZE 0.25 - 0.5mm

Note: Specification for CU (4 – 6) and Effective Size (0.15 – 0.30 mm) are presented in "Wisconsin Mound Soil Absorption System: Siting, Design, and Construction Manual, January 2000."

Thank you for your interest in our products. If you have any questions or require additional information, please contact Dave Olson, Lab-Quality Control Manager or me at 301-845-6341.

Sincerely,

Jerry Blank-VP Sales/Mktg.
Laurel Sand & Gravel, Inc.
T/A S.W. Barrick & Sons

Cc: Kevin Wolfe-Inspection
Howard Co. Health Dept.

LAUREL SAND & GRAVEL INC. T/A

S.W. Barrick & Sons

P.O. Box 86
Woodsboro, MD 21798

SALES OFFICE: 301-845-6341
FAX: 301-845-2396
ORDERS & DISPATCH: 301-845-6343
800-545-6343

Fax Number: 301-845-2396

Office Number: *301-845-6341*

FACSIMILE COVER SHEET

Date: 4/20/2011

To: Bill Ingram *Fax #:* 410.442.3280

Company Farm & Home Exc. Inc.

Re: Sand Cert.

From: Kathy + Jen *Number of Pages:* 2
Including Cover Page

Should you have any difficulties during transmission, kindly contact this person sending the facsimile via the number shown above.

Message Bill,

Please see attached Sand Mound Sand Cert. for the "Mink Hollow Road Project".

Please if you could forward a copy to Kevin Wolfe @ Howard Co. Health Dept.

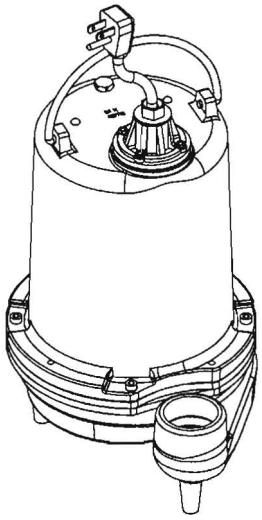
Thanks!

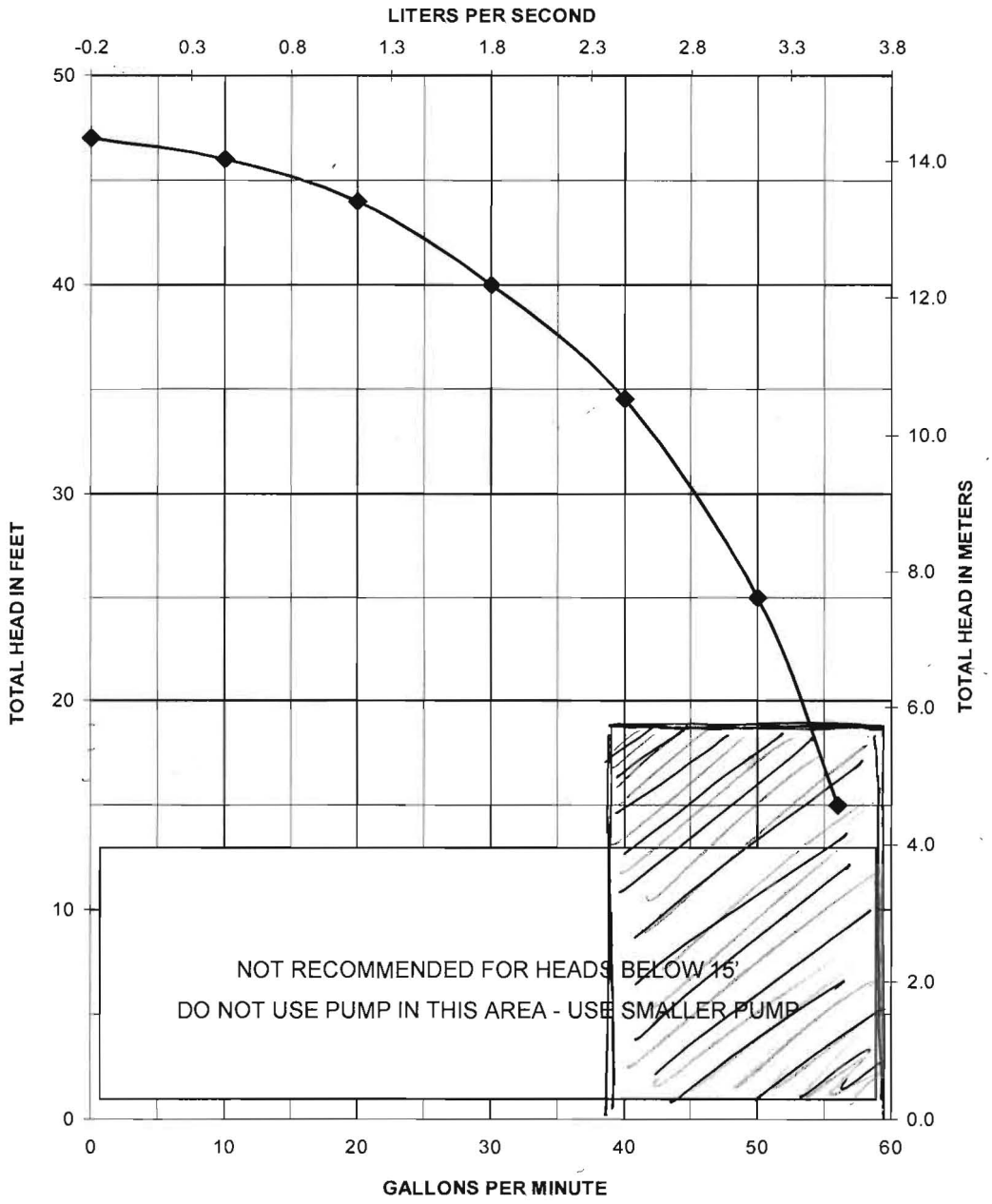
Kathy

Liberty Pumps®

Pump Specifications

FL50 Series 1/2 hp Submersible Effluent Pump

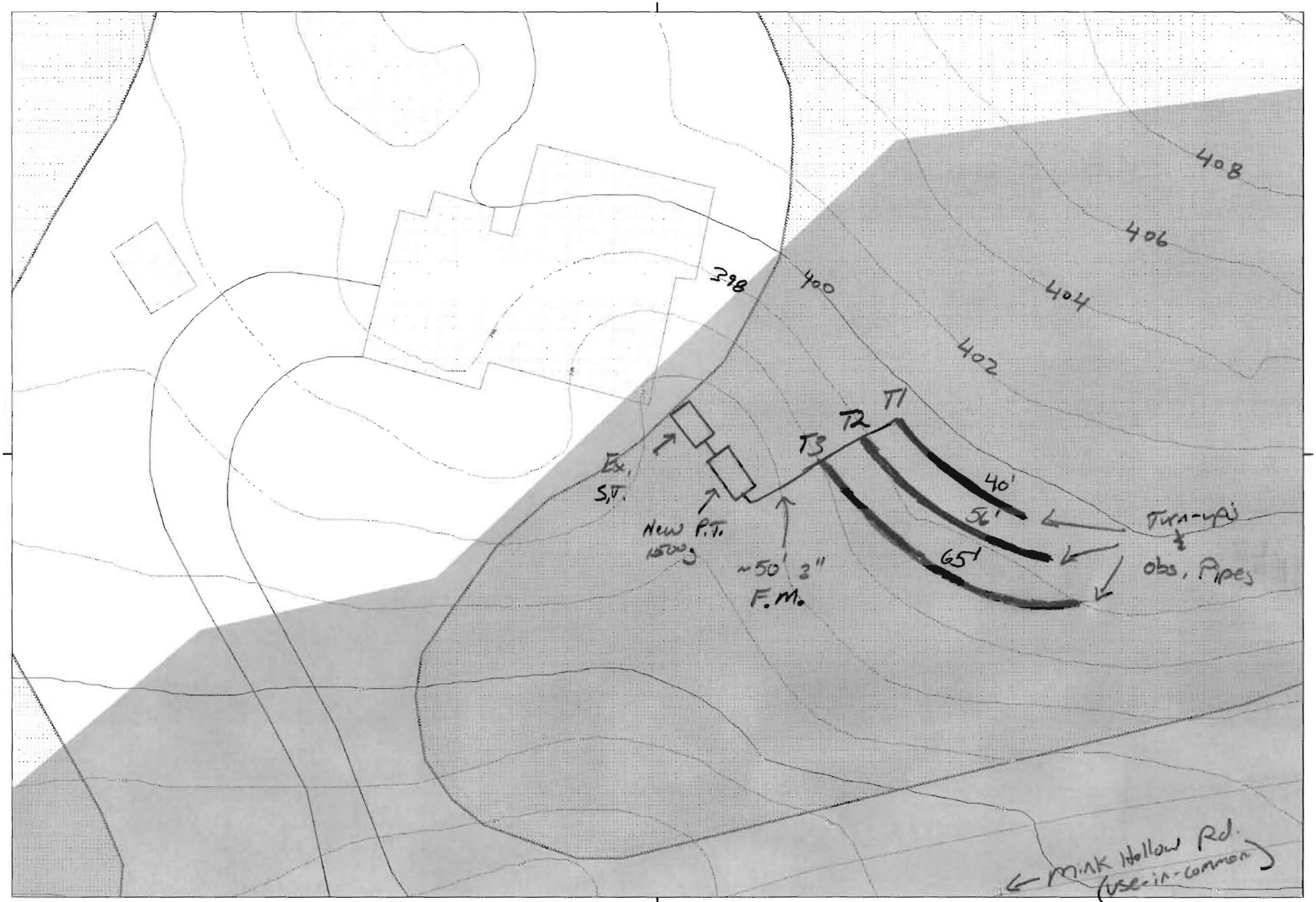




Liberty Pumps

-76^59'57"

39^10'9."



39^10'9."

-76^59'57"

Howard County

MARYLAND

By:
Office:
Map Width: 273.00 ft.
Print Date: 11/1/2010
Scale: 1 in. = 30 ft.

We are an Equal Opportunity Employer

DISPATCH / SALES
301-953-8973
410-792-3753

SAVAGE STONE, LLC
SAVAGE, MARYLAND
Mailing Address: P.O. Box 850, Laurel, Maryland 20725

CUSTOMER'S COPY

BILLING INQUIRIES
301-953-7650
410-792-7234

TICKET #00459605
STATION SS
DATE 05/12/11 TIME 09:01:14

CUSTOMER FARHOM
FARM AND HOME EXCAVATING
901 DRIVER ROAD
MARRIOTTSVILLE, MD 21104

JOB VARLOC : VARIOUS LOACATIONS
P.O. # PROJECT #: MINK HOLLOW RD

TRUCK FH5124 LICENSE 3 AXLES
DRIVER: FARM AND HOME EXCAVATING

					Loads	Tons
GROSS		SCALE A	58240 lb	DAILY	1	15.71
TARE	IN	(STORED)	26820 lb	TOTAL	4	62.55
NET			31420 lb	TIME IN 09:01:14		TIME OUT 09:01:14
NET			**15.71 t**			

MAT'L 0026 : #57 STONE
HAUL ZONE 0000

WEIGHMASTER _____
Gail Harrison

RECEIVED BY _____

SAFETY FIRST! HAVE A GREAT DAY! PLEASE CHECK YOUR TICKET!

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SAVAGE STONE, LLC

SAVAGE, MARYLAND

Mailing Address: P.O. Box 850, Laurel, Maryland 20725

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410-792-3753

CUSTOMER'S COPY

BILLING INQUIRIES
301-953-7650
410-792-7234

TICKET #00459758

STATION SS

DATE 05/12/11 TIME 11:22:13

CUSTOMER FARHOM
FARM AND HOME EXCAVATING
901 DRIVER ROAD
MARRIOTTSVILLE, MD 21104

JOB VARLOC : VARIOUS LOACATIONS
P.O. # PROJECT #: MINK HOLLOW RD

TRUCK FH5124 LICENSE 3 AXLES
DRIVER: FARM AND HOME EXCAVATING

					Loads	Tons
GROSS		SCALE B	56780 lb	DAILY	2	30.69
TARE	IN	(STORED)	26820 lb	TOTAL	5	77.53
NET			29960 lb	TIME IN 11:22:13		TIME OUT 11:22:13
NET			**14.98 t**			

MAT'L 0026 : #57 STONE
HAUL ZONE 0000

WEIGHMASTER Stacey Hawke

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SAVAGE, MARYLAND

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410-792-7234

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TICKET #00459370
STATION SS
DATE 05/11/11 TIME 14:11:25

CUSTOMER FARHOM
FARM AND HOME EXCAVATING
901 DRIVER ROAD
MARRIOTTSVILLE, MD 21104

JOB VARLOC : VARIOUS LOACATIONS
P.O. # PROJECT #: MINK HOLLOW RD

TRUCK FH5124 LICENSE 3 AXLES
DRIVER: FARM AND HOME EXCAVATING

					Loads	Tons
GROSS		SCALE A	56580 lb	DAILY	1	14.88
TARE	IN	(STORED)	26820 lb	TOTAL	3	46.84
NET			29760 lb	TIME IN 14:11:25		TIME OUT 14:11:25
NET			**14.88 t**			

MAT'L 0026 : #57 STONE
HAUL ZONE 0000

WEIGHMASTER Stacey Hawke

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DISPATCH / SALES
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410-792-3753

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Mailing Address: P.O. Box 850, Laurel, Maryland 20725

BILLING INQUIRIES
301-953-7650
410-792-7234

TICKET #00459370
STATION SS
DATE 05/11/11 TIME 14:11:25

CUSTOMER FARHOM
FARM AND HOME EXCAVATING
901 DRIVER ROAD
MARRIOTTSVILLE, MD 21104

JOB VARLOC : VARIOUS LOACATIONS
P.O. # PROJECT #: MINK HOLLOW RD

TRUCK FH5124 LICENSE 3 AXLES
DRIVER: FARM AND HOME EXCAVATING

					Loads	Tons
GROSS		SCALE A	56580 lb	DAILY	1	14.80
TARE	IN	(STORED)	26820 lb	TOTAL	3	46.84
NET			29760 lb	TIME IN 14:11:25		TIME OUT 14:11:25
NET			**14.88 t**			

MAT'L 0026 : #57 STONE
HAUL ZONE 0000

WEIGHMASTER Stacey Hawke

RECEIVED BY

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BQ

Barrick Dispatch 301-845-6343
Barrick Sale 301-845-6341

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S.W. Barrick & Sons

WOODSBORO, MARYLAND

Mailing Address:
P.O. Box 1504
Laurel, Maryland 20725

CUSTOMER'S COPY

BILLING INQUIRIES
1-800-762-2294

Sand

TICKET #00810411
STATION
DATE 05/11/11 TIME 11:57:11

CUSTOMER FARHOM
FARM AND HOME EXCAVATING INC
901 DRIVER RD
MARRIOTTSVILLE, MD 21104

JOB MINHOL : MINK HOLLOW RD SEPTIC
P.O. # PROJECT #:

TRUCK 0001 LICENSE 3 AXLES
DRIVER: CUSTOMER PICK UP

	lbs.
GROSS	68440
TARE (STORED)	26840
NET	41600
NET TONS	**20.80**

	Loads	Tons
DAILY	1	20.80
TOTAL	1	20.80

TIME IN 11:57:11 TIME OUT 11:57:11

MAT'L 02 : WASH CONCRETE (C33)ASTM
HAUL ZONE 0000

WEIGHMASTER _____
Tracey Shaeffer

RECEIVED BY _____

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SAVAGE STONE, LLC

SAVAGE, MARYLAND

Mailing Address: P.O. Box 850, Laurel, Maryland 20725

DISPATCH / SALES
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410-792-3753

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BILLING INQUIRIES
301-953-7650
410-792-7234

TICKET #00460057
STATION SS
DATE 05/12/11 TIME 15:40:49

CUSTOMER FARHOM
FARM AND HOME EXCAVATING
901 DRIVER ROAD
MARRIOTTSVILLE, MD 21104

JOB VARLOC : VARIOUS LOACATIONS
P.O. # PROJECT #:

TRUCK FH5124 LICENSE 3 AXLES
DRIVER: FARM AND HOME EXCAVATING

					Loads	Tons
GROSS		SCALE B	67820 lb	DAILY	1	20.50
TARE	IN	(STORED)	26820 lb	TOTAL	1	20.50
NET			41000 lb	TIME IN 15:40:49		TIME OUT 15:40:49
NET			**20.50 t**			

MAT'L 0022 : MD #2 STONE
HAUL ZONE 0000

WEIGHMASTER _____ RECEIVED BY _____
Gail Harrison

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SAVAGE STONE, LLC

SAVAGE, MARYLAND

Mailing Address: P.O. Box 850, Laurel, Maryland 20725

DISPATCH / SALES
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410-792-3753

CUSTOMER'S COPY

BILLING INQUIRIES
301-953-7650
410-792-7234

TICKET #00460249
STATION SS
DATE 05/13/11 TIME 08:49:23

CUSTOMER FARHOM
FARM AND HOME EXCAVATING
901 DRIVER ROAD
MARRIOTTSVILLE, MD 21104

JOB VARLOC : VARIOUS LOACATIONS
P.O. # PROJECT #: MINK HOLLOW RD

TRUCK FH5124 LICENSE 3 AXLES
DRIVER: FARM AND HOME EXCAVATING

					Loads	Tons
GROSS		SCALE A	68360 lb	DAILY	1	20.77
TARE	IN	(STORED)	26820 lb	TOTAL	6	98.30
NET			41540 lb	TIME IN 08:49:23		TIME OUT 08:49:23
NET			**20.77 t**			

MAT'L 0026 : #57 STONE
HAUL ZONE 0000

WEIGHMASTER _____ RECEIVED BY _____

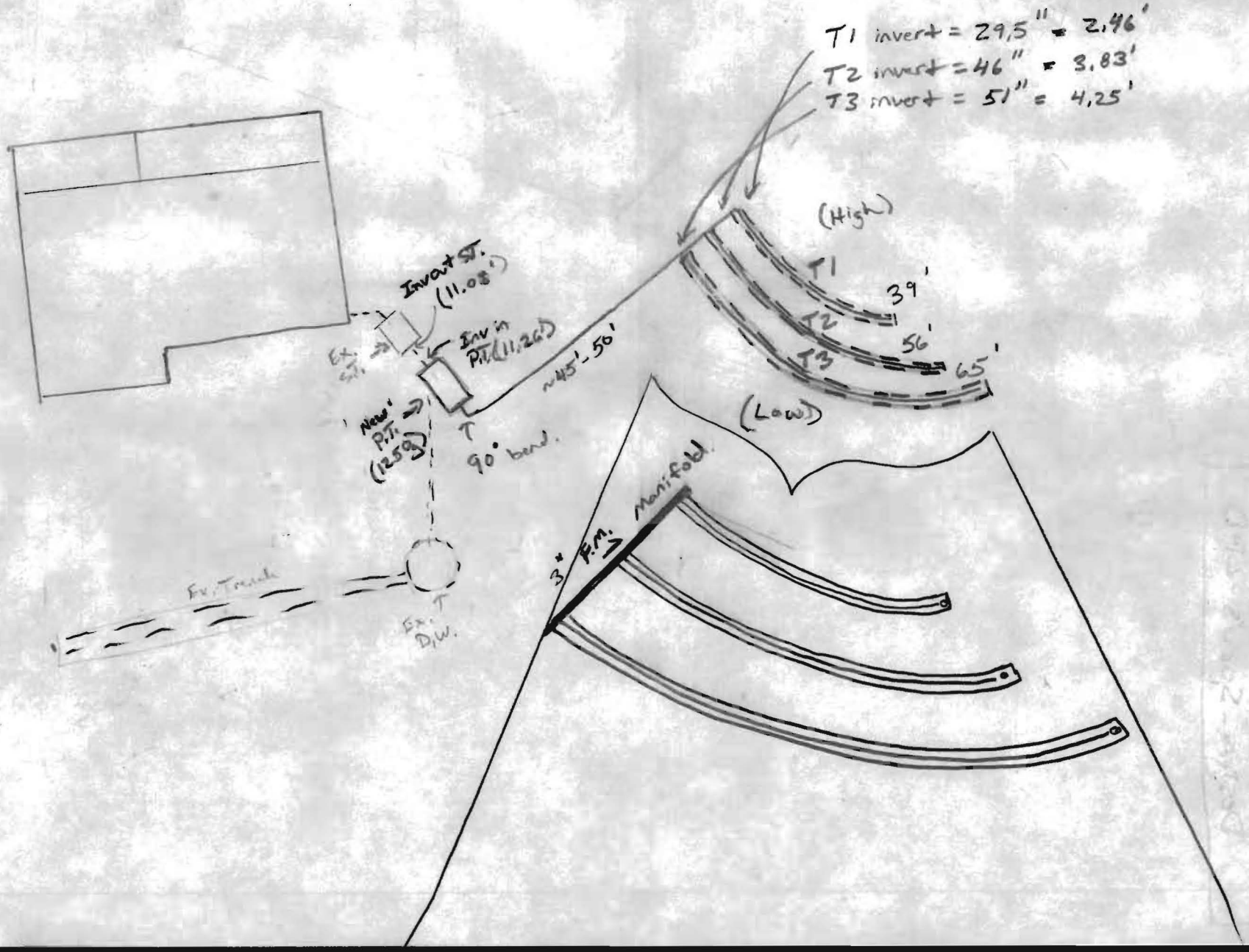
Stacey Hawke

SAFETY FIRST! HAVE A GREAT DAY! PLEASE CHECK YOUR TICKET!

Laterals

Lateral Diameter : 2"
Force main Dia. : 3"
Lateral lengths :

Trenches : 2' wide
Inlet @ 2'
Bottom @ 7'



7429 Mink Hollow Rd.
Design Spec's - LPD

Trenches:
Inlet → 2' [clean #2 stone 2'-6']
Bottom → 7'
w/ ~1' sand mound
sand @ bottom

2' of head
Q = 5/16" @ 1.63 gpm

5' of head (Distal)
@ 5/16" @

- manifold length = 24'
- 3 laterals
- 5/16" holes

Laterals
(Highest) T1 = 29.5" → (2.46')
T2 = 46" → (3.83')
(lowest) T3 = 51" → (4.25')

Pump Tank: Inlet 64" bottom of tank to outlet invert

* Pump tank must be reversed. Use Inlet as outlet.

Liberty Pump 1/2 HP model FL50

sewer outlet from Ex. S.T.: 44" below grade
Elevation shot in field: 133" (11.1')

5 x 90° bends
2 x "Tee's"

TDH = Static head + Friction Head + Distal Head (=5')

Static Head = (29.5") (T1 elev) − 174" = 145.0" (12.1')

Friction Head = * @ 60 gpm per 100' of 3" pipe = 0.81 friction loss *

- 50' of 3" pipe = 50'
- 5 x 90° bends @ 10' of pipe per 90° = 50'
- 2 x "Tee" @ 3' of pipe per "Tee" = 6'
- 1 "Union" @ 3' of pipe per Union = 3'

109' total equivalent

1.09 x .81 = .8829 ft friction loss

Distal Head = 5' = @ 109' = .883 ft friction loss

Dose: length of F.M + manifold = 50' of 3" sch 40
50' x 38.4 ÷ 100 = 19.2 gallons

length of laterals = 161' of 1.5" sch 40
161' x 10.6 ÷ 100 = 17.0 gallons

→ (5 x 17.0 g) + 19.2 g = 104.2 g (min Dose)

1/6 x 600 g = 100 g

Dose → 104.2 g

Flow: 5/16" holes
Q = 2.66 gpm

T1 has 5 perforations
T2 has 8 perf.
T3 has 10 perf.
Total Perf. = 23

23 x 2.66 = 61.0 gpm

Flow = 61.0 gpm

Design Head = 12.1' (static) + 0.883' (friction) + 5' (distal)

TDH = 17.983'

$Q = 11.82 \times d^2 \times \sqrt{h}$
d = Diameter of hole
h = Distal head
$11.82 \times (.100467) \sqrt{5} = 2.66$ gpm

DESIGN FLOW (in gallons/day)?	600		
Elevation of the PUMP OFF SWITCH, in feet?	14.5		Yellow cells inputs
Elevation of the upper LATERAL, in feet?	2.46		
DELIVERY PIPE distance, from pump to manifold, in feet?	45		
DELIVERY PIPE diameter, in inches (if not 2"--use 2" min)?	3	(Inside Diameter)	
Design DISTAL PRESSURE, in feet (if not 2.5)? (hd)	5		
IS MANIFOLD CENTER-FED & SYMETRICAL (yes or no)?	no	GO TO MANIFOLD DESIGN	<50 feet up to 75 usually END FEED
How many orifices in the MANIFOLD?	0	(Ignore)	
MANIFOLD ORIFICE diameter, in inches (if not 5/16")	0	0.3125 (Ignore)	
MANIFOLD DIAMETER (if not 2"--use 2" min)?	3	3 (Inside Diameter)	
TOTAL LENGTH OF MANIFOLD	24		
Does MANIFOLD drain to FIELD after dose (yes or no)?	no	(Are you pumping downhill)	
How many LATERALS?	3		
Pumping chamber weep hole size (usually .25")	0.25	USE 0 IF FORCE MAIN DOES NOT DRAIN Back to Pump Chamber	

PROGRAM WILL CALCULATE UP TO 26 LATERALS AND UP TO 50 ORIFICES PER LATERAL

TRENCH LENGTH	40	56	65		
Your HIGHEST elevation lateral MUST be LATERAL 1:					
(first orifice from lateral 1/2 of orifice spacing)	Lateral 1:	Lateral 2:	Lateral 3:		
Length of each LATERAL, in feet?	36.00	52.50	61.75		
Diameter of each LATERAL, in inches (1.5" min)?	1.5	1.5	1.5	0	0
Elevation of each LATERAL, in feet?	2.46	3.8	4.25	0	0
Number of ORIFICES per lateral	5	8	10	0	0
Distance from Manifold to closest Orifice, in feet	4.00	3.50	3.25		
ORIFICE SPACING, in feet (2-6 ft ok 3-6 preferred)	8.00	7.00	6.50		
Diameter of ORIFICES, in inches? (D)	0.3125	0.3125	0.3125	0	0
Square feet of leachfield per laterals (can ignore)	120	168	195	0	0
Maximum number of orifices in any one lateral	0				
Minimum lateral diameter					

FRICTION CALCULATIONS (using Hazen Williams friction ft= Ld((3.55Qm/Ch(Dd^2.63)))^1.85)
PRESSURE CALCULATIONS (using orifice dischage equation Q=11.79 D^2 hd^.5

	Lateral 1:	Lateral 2:	Lateral 3:			
LATERAL DISCHAGE (first approximation)	12.87	20.60	25.75			
MANIFOLD ORIFICE DISCHARGE	0.00					
TOTAL SYSTEM DISCHAGE (first approximation)	**59.21**					
TOTAL DISCHARGE PER LATERAL	12.91	17.76	20.86			
DISCHARGE PER SQUARE FOOT OF LEACHFIELD	**0.10761234**	**0.105694593**	**0.10698314**			
ORIFICE MAXIMUM DISCHARGE BY LATERAL	2.60	2.25	2.13			
ORIFICE MINIMUM DISCHARGE BY LATERAL	2.57	2.20	2.06			
ORIFICE % DIFFERENCE DISCHARGE within LATERAL	0.8%	2.0%	3.0%	0.0%	0.0%	0.0%
MAXIMUM DISCHARGE LATERAL	20.86					
MINIMUM DISCHARGE LATERAL	12.91					
MAXIMUM DISCHARGE PER SQUARE FOOT	0.11					
MINIMUM DISCHARGE PER SQUARE FOOT	0.11					
% DIFFERENCE DISCHARGE for SYSTEM by orifice	20.5%	as percent of maximum orifice in system				
% DIFFERENCE DISCHARGE for SYSTEM by laterals	**38.1%**	**as percent of maximum lateral in system**				
% DIFFERENCE DISCHARGE for SYSTEM by square feet	**1.8%**	**as percent of maximum square foot in system**				

WEEP HOLE DISCHARGE (usually a 1/4" weep hole) #NUM! weep hole= 0.25 inch

WARNING: THERE IS GREATER THAN A 15% DIFFERENCE IN ORIFICE DISCHARGE RATES
WARNING: THERE IS GREATER THAN A 15% DIFFERENCE IN LATERAL DISCHARGE RATES

VOID VOLUME IN DELIVERY PIPE	16.52					
VOID VOLUME IN MANIFOLD	6.28	Volume from Manifold Design				
VOID VOLUME IN EACH LATERAL	3.30	4.82	5.67	0.00	0.00	0.00
TOTAL LATERAL VOID VOLUME	13.79					

MINIMUM DOSE VOLUME (based on void volume) 68.96 to 137.92 MIN
ACTUAL MINIMUM IS BASED ON DAILY DESIGN FLOW
(weep hole, usually 1/4", not counted for dose, effluent is repumped during process and not counted for friction, except as fitting headloss)

TOTAL HEAD LOSS IN EACH LATERAL	0.35	0.75	1.10

MAXIMUM TOTAL LATERAL HEADLOSS IN SYSTEM	1.10	
MANIFOLD HEADLOSS (center-fed unless manifold design)	0.90	
DELIVERY PIPE HEADLOSS	0.31	w/ delivery 3 inch diameter
FITTING LOSS (headloss *.15)	0.75	add extra head if fittings are more than absolute minimum
DISTAL PRESSURE HEAD	5.00	
STATIC HEAD (OFF-SWITCH TO HIGH LATERAL/MANIFOLD)	-12.04	
HEADLOSS PUMP TO WEEPHOLE (assume 3' run)	#NUM!	

PUMP MUST BE ABLE TO PASS SOLIDS AT	#NUM!	G.P.M	#NUM!	FEET OF HEAD
or				
After OTIS (network losses =1.3*distal head)	#NUM!	G.P.M.	#NUM!	FEET OF HEAD