

PUBLIC SEWER STATUS VERIFIED BY

ISSUE DATE:

6/6/12

PERMIT

P 537529

APPROVAL DATE:

6/26/12

A REPAIR

Septic Repair

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

Hatfield's Equipment IS PERMITTED TO INSTALL ALTER

ADDRESS: P.O. Box 519 Annapolis Junc. MD 20701 PHONE NUMBER: 301-490-4289

SUBDIVISION: _____ LOT NUMBER: 1

ADDRESS: 7052 Pindell School Road PROPERTY OWNER: Tom Smith

SEPTIC TANK CAPACITY (GALLONS): 1500

PUMP CHAMBER CAPACITY (GALLONS): 1250

NUMBER OF BEDROOMS: 3

SQUARE FEET OF HOUSE: <3501

LINEAR FEET OF TRENCH REQUIRED: 110 LF

LPD Distribution system- refer to design plans

TRENCHES:	Trenches to be <u>2</u> feet wide. Inlet <u>2</u> feet below original grade. Bottom maximum depth <u>9</u> feet below grade. Effective area begins at <u>7</u> feet below original grade with <u>7</u> feet of stone below distribution pipe.
LOCATION:	Both tanks to be set along-side ex. driveway. Refer to design plan for location.
NOTES:	Existing drywell to be pumped and collapsed. Obs. pipes to be installed at ends of trenches. A final start-up will be needed for approval of system.

**Design is for 3 bedrooms. Upgrading bedrooms or future repair may require pre-treatment.*

PLANS APPROVED: K. Wolf DATE: 6/19/2012

NOTE: PERMIT VOID AFTER 2 YEARS

NOTE: CONTRACTOR RESPONSIBLE FOR SCHEDULING A PRE-CONSTRUCTION INSPECTION FOR ALL INSTALLATIONS

NOTE: WATERTIGHT SEPTIC TANKS REQUIRED

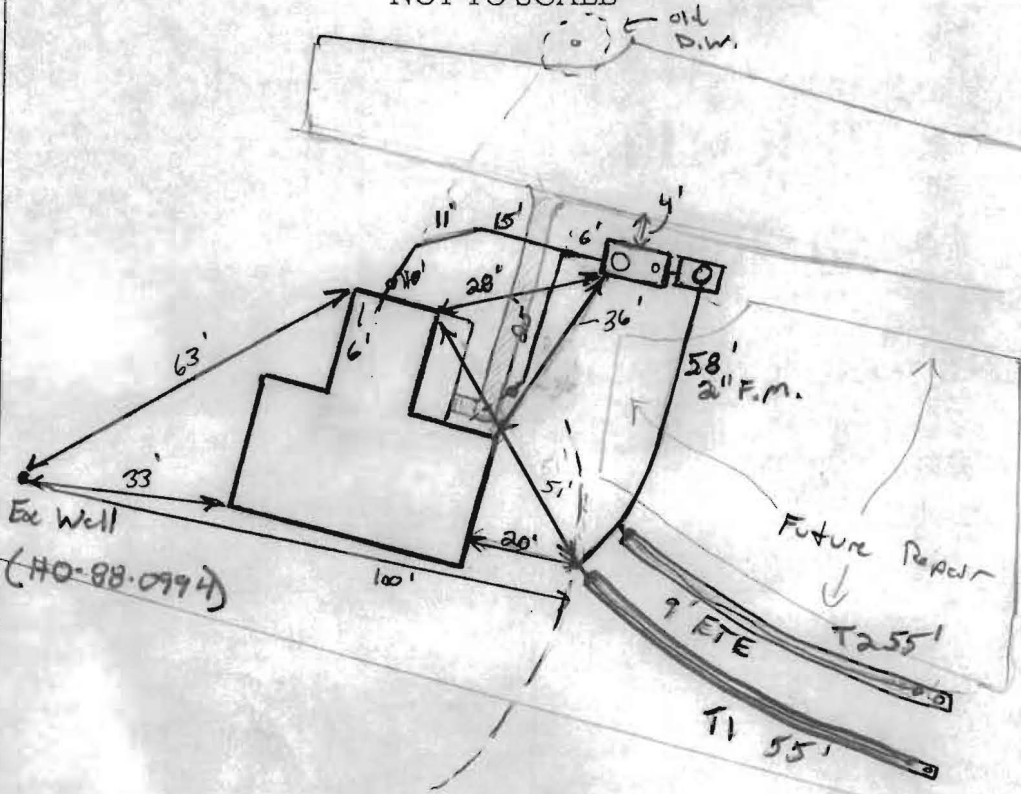
NOTE: ALL PARTS OF SEPTIC SYSTEM SHALL BE 100 FEET FROM ANY WATER WELL

NOTE: MANHOLE RISERS REQUIRED ON ALL SEPTIC TANKS AND PUMP CHAMBERS

NOTE: AN ELECTRICAL PERMIT IS REQUIRED FOR INSTALLATION OF ANY ELECTRICAL COMPONENTS OF THE SYSTEM

NEITHER THE HOWARD COUNTY COUNCIL OR THE HEALTH DEPARTMENT IS RESPONSIBLE FOR THE SUCCESSFUL OPERATION OF ANY SYSTEM PERMITTEE RESPONSIBLE FOR OBTAINING FINAL APPROVAL ON THIS PERMIT CALL 410-313-1771 FOR INSPECTION OF SEPTIC SYSTEM

NOT TO SCALE



* Gate valve turned 40%

2" F.M.
 1 1/2" laterals @ 52.5' long
 5/16" holes @ 11 total per/lateral

Distal Head
 T1 = 38"
 T2 = 46"

ROAD NAME

TRENCH/DRAINFIELD DATA		
WIDTH	INLET	BOTTOM
2'	2-3'	9'
NUMBER OF TRENCHES 2'		
TOTAL LENGTH 110'		
ABSORPTION AREA 220'± SW		
DISTRIBUTION BOX LEVEL		
DISTRIBUTION BOX BAFFLE		
DISTRIBUTION BOX PORT		

SEPTIC TANK DATA	
SEPTIC TANK I LEVEL	Yes
MANUFACTURER	Babylon
CAPACITY	1500 GAL
SEAM LOC	Top
TANK LID DEPTH	1.5'
BAFFLES	Yes
BAFFLE FILTER	
MANHOLE LOC	Front
6" PORT LOC	Back
WATERTIGHT TEST	
SLOTTED	Yes
DATE ON LID	5/22/12
PUMP SEPTIC TANK LEVEL Yes	
MANUFACTURER	Babylon
CAPACITY	1250 GAL
SEAM LOC	Top
TANK LID DEPTH	
BAFFLES	Front
BAFFLE FILTER	
MANHOLE LOC	center
6" PORT LOC	none
WATERTIGHT TEST	
SLOTTED	no
DATE ON LID	5/14/12

PRE-CONSTRUCTION:

6/11/12 layout of S.T and P.T locations. Trenches, laterals and elevations shot in field. Design awaiting. (KIP)
 6/21/12 contractor picked up permit and design to start on 6/25/12

* Contractor had installed T1 trench per 8" higher in elevation by mistake. hence the distal heads in T1 and T2 (38", 46" respectively).

INSTALLATION:

6/25/12 tanks set. F.M. ran up to manifold. Contractor pre-drilling laterals. Ex. tank and drywall proposed and collapsed. OK to continue. 6/26/12 (am) system complete. Trenches installed with laterals, drops and obs. pipes. Elevation not quite finished. Alarm not working. Replace/dia call when complete. Upper lateral 8-10" higher than lower trench. should be OK.
 6/26/12 (pm) Pump test - T1 measured 38" T2 measured 47". Gate valve turned almost 1/2 turn. OK to cover.

FINAL INSPECTOR

J. King

DATE OF APPROVAL

6/26/12

LPD

Initial

Design Specs For 7052 Pindell School Rd.

5/22/12

(Kw)

- 3 bedrooms
- Design Flow = 450 gpd.

* Ex. s.t. and D.W. will be pumped and collapsed.

- New Septic Tank / Pump tank * - 1500g S.T. (2 compartment)
- 1250g P.T.

* Pending BAT unit for nitrogen reduction.

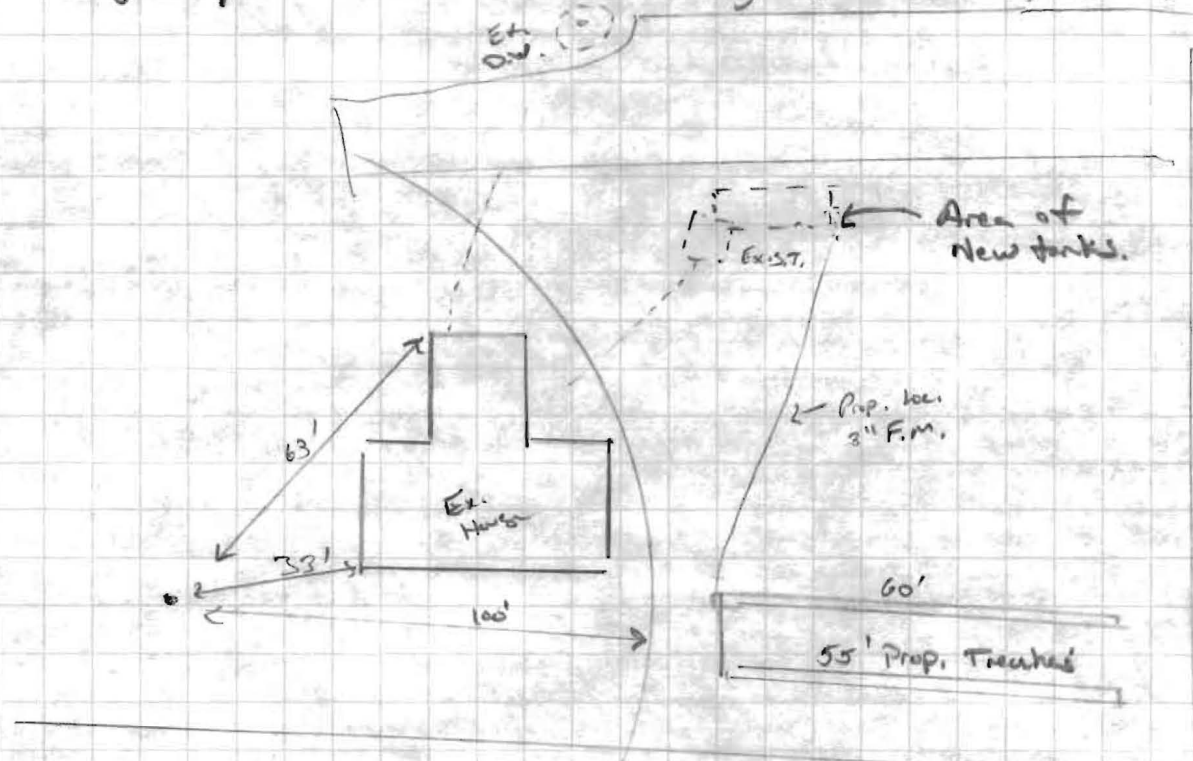
- 3" F.M. (~ 80')
- 1.5" laterals.
- Trenches to be 2'-3' below grade
Bottom's 9' below grade.

Total trench length = ~ 115' LF
Effective area ~ 5'-9'

- ~ 96 ton washed/clean septic stone

- Tank(s) will set parallel w/ ex. Drive as to connect existing plumbing @ both locations out of house.

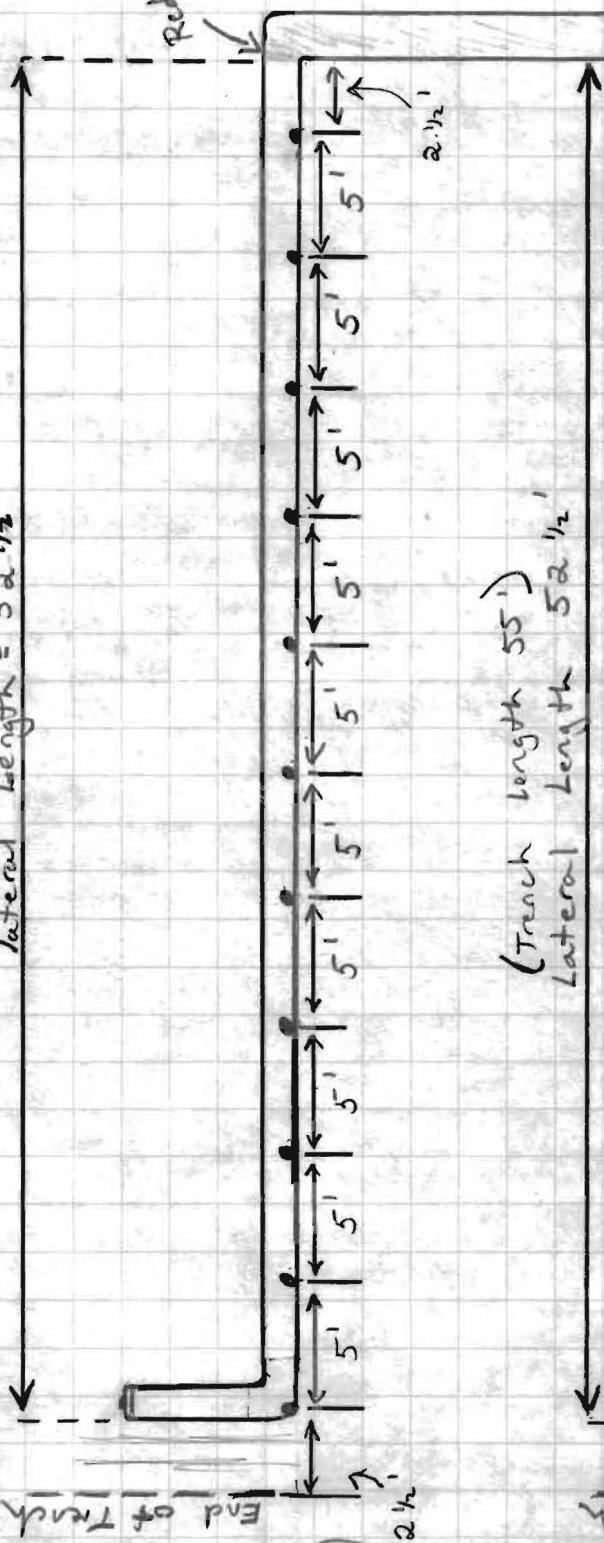
* System will be low pressure dosed. Design pending BAT unit approval. length of trench may change slightly to accommodate design (i.e. Dose, +Dtt, Flow etc...)



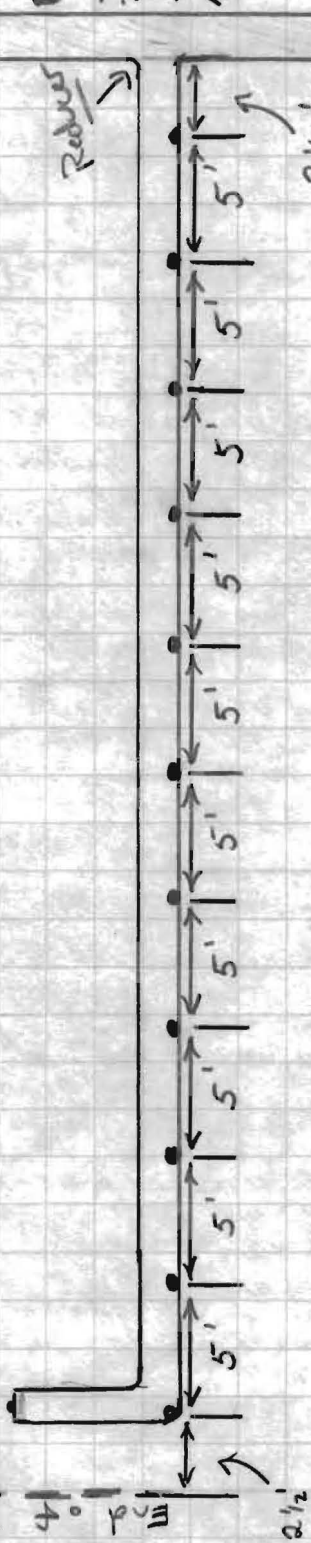
Laterals Detail

#1
Trench (T1)
Upper

* Drill last hole 45° angle on elbow



#2
Trench (T2)
Lower



* Start Trenches about 1' from manifold #

Data:

Trench Length =	55'
Lateral length =	52 1/2'
Lateral Diameter =	1 1/2"
Hole Diameter =	5/16"
Hole Spacing =	5'
# of Perf. =	11
Manifold Diameter =	2"
Force Main Dia =	2"
Length of F.M. =	70'

← P = F.M. →

System Design, Details, Pump Specs, etc...

Trenches: T1 (Upper) = 2' wide, Inlet @ 18", bottom @ 9'
T2 (Lower) = 2' wide, Inlet @ 12", bottom @ 9'

Septic Tank : 1500g two compartment (Babylon)

Pump Tank = 1250g one compartment (Babylon)
Grade over pump tank = 96" w/ 2' of over = 108"
Bottom elevation of pump tank = 170" (14.17')
Pump off elevation = 152" **12.7'**

Sewer out Relative Elevation shot in field @ c/o = 125" (10.42')

Laterals: (1.5') T1 (Highest Trench) - Ground elevation shot in field = 18" (1.5')
- Spot elevation + Invert = 36" (3')
(2') T2 (Lower Trench) - Ground Elevation shot in field = 24" (2')
Hole Diameter = 5/16" - Spot elevation + Invert = 36" (3')

Static Head: (T1, T2 Elevation) - (Pump off Elevation) = static head
36" - 164" = **128"** **10.67'**

Manifold: length = 10'
Diameter = 2"

Force Main: length = 70'
Diameter = 2"

Friction Head: * @ 45gpm per 100' of 2" pipe = 3.43 friction loss

4 x 90° x 3" = 40'

1 x 45° x 3" = 6'

1 x check valve =

1 x 90° side Tee = 15'

1 x Gate valve = 2'

70' x 3" = 70'

total = **133'** total equivalent

1.33 x 3.43 = **4.5619** ft friction loss

Flow: 5/16" holes $Q = 11.82 \alpha d^2 \times \sqrt{h}$ = 11.82 x (.09765625) $\sqrt{3.5}$ =
D = diameter of hole = 1.1555893 $\sqrt{3.5}$ = 2.16gpm
h = Distal head $Q = 2.16$ gpm

T1 = 11 T2 = 11

22 x 2.16 = **47.52gpm**

Total perf. **22**

... continued →

Dose: length of F.M. + manifold = 70' of 2" sch 40

$$70' \times 17.4 \div 100 = 12.18 \text{ g}$$

$$\text{length of laterals} = 104.5 \times 10.6 \div 100 = 11.08 \text{ g}$$

$$(5 \times 11.08 \text{ g}) + 12.18 \text{ g} = 67.58 \text{ g (min Dose)}$$

$$1/6 \times 600 \text{ g} = 100 \text{ g}$$

$$\text{Dose} = \boxed{100 \text{ g}}$$

Design Head:

static head + Friction head + distal head

$$= 10.67' + 4.5619 + 3.5'$$

$$\text{TDH} = \boxed{18.73'}$$

Design Flow:

3 Bedrooms = 450 gpd.

150 gpd / per bedroom

0.8 app. Rate

$$\frac{3(150)}{0.8} = \frac{450 \text{ gpd/BR}}{0.8} = 562.5 \div 2' = 281.25$$

*.36 (4' of sidewall reduction)

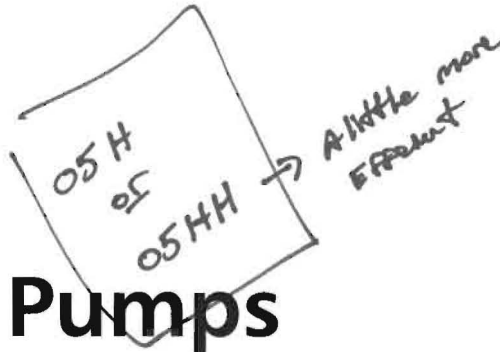
$$= 281.25 (.40) = \underline{\underline{112 \text{ LF}}} \text{ of Trunk.}$$



ITT

B3885

Wastewater



Goulds Pumps

WE Series Model 3885

Submersible Effluent Pump

EXTENDED WARRANTY AVAILABLE FOR RESIDENTIAL APPLICATIONS.



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.
- **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 all models to guard against component damage on accidental reverse rotation.
- **Fasteners:** 300 series stainless steel.
- Capable of running dry without damage to components.
- Designed for continuous operation when fully submerged.



Goulds Pumps is a brand of ITT Corporation.

www.goulds.com

Engineered for life

DESIGN FLOW (in gallons/day)?
 Elevation of the PUMP OFF SWITCH, in feet?
 Elevation of the upper LATERAL, in feet?
 DELIVERY PIPE distance, from pump to manifold, in feet?
 DELIVERY PIPE diameter, in inches (if not 2"--use 2" min)?
 Design DISTAL PRESSURE, in feet (if not 2.5)? (hd)
 IS MANIFOLD CENTER-FED & SYMETRICAL (yes or no)?
 How many orifices in the MANIFOLD?
 MANIFOLD ORIFICE diameter, in inches (if not 5/16")
 MANIFOLD DIAMETER (if not 2"--use 2" min)?
 TOTAL LENGTH OF MANIFOLD
 Does MANIFOLD drain to FIELD after dose (yes or no)?
 How many LATERALS?
 Pumping chamber weep hole size (usually .25")

450	
12.7	Yellow cells inputs
3	
70	
2	(Inside Diameter)
3.5	
no	GO TO MANIFOLD DESIGN <50 feet up to 75 usually END FEED
0	(Ignore)
0	0.3125 (Ignore)
2	2 (Inside Diameter)
10	
no	(Are you pumping downhill)
2	
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	
55	55

Your HIGHEST elevation lateral MUST be LATERAL 1:
 (first orifice from lateral 1/2 of orifice spacing)

Length of each LATERAL, in feet?
 Diameter of each LATERAL, in inches (1.5" min)?
 Elevation of each LATERAL, in feet?
 Number of ORIFICES per lateral
 Distance from Manifold to closest Orifice, in feet
 ORIFICE SPACING, in feet (2-6 ft ok 3-6 preferred) 3-10 in MD
 Diameter of ORIFICES, in inches? (D)
 Square feet of leachfield per laterals (can ignore)
 Maximum number of orifices in any one lateral
 Minimum lateral diameter

	Lateral 1:	Lateral 2:			
52.50	52.50	0.00	0.00	0.00	0.00
1.5	1.5	1.5	1.5	1.5	1.5
3	3	358.2	357.9	357	357
11	11	8	8	7	7
2.50	2.50	0.00	0.00	0.00	0.00
5.00	5.00	0.00	0.00	0.00	0.00
0.3125	0.3125	0.25	0.25	0.25	0.25
165	165	0	0	0	0
11					
1.5					

FRICITION CALCULATIONS (using Hazen Williams friction $f_t = L_d((3.55Q_m/Ch(Dd^2.63)))^{1.85}$)
 PRESSURE CALCULATIONS (using orifice discharge equation $Q = 11.79 D^2 hd^{0.5}$)

	Lateral 1:	Lateral 2:			
LATERAL DISCHAGE (first approximation)	23.69	23.69	11.03	11.03	9.65
MANIFOLD ORIFICE DISCHARGE	0.00				
TOTAL SYSTEM DISCHAGE (first approximation)	79.10				

TOTAL DISCHARGE PER LATERAL	23.94	23.94			
DISCHARGE PER SQUARE FOOT OF LEACHFIELD	0.14510227	0.145102268			
ORIFICE MAXIMUM DISCHARGE BY LATERAL	2.22	2.22			
ORIFICE MINIMUM DISCHARGE BY LATERAL	2.15	2.15			
ORIFICE % DIFFERENCE DISCHARGE within LATERAL	2.8%	2.8%	0.0%	0.0%	0.0%
MAXIMUM DISCHARGE LATERAL	23.94				
MINIMUM DISCHARGE LATERAL	23.94				
MAXIMUM DISCHARGE PER SQUARE FOOT	0.15				
MINIMUM DISCHARGE PER SQUARE FOOT	0.15				
% DIFFERENCE DISCHARGE for SYSTEM by orifice	2.8%	as percent of maximum orifice in system			
% DIFFERENCE DISCHARGE for SYSTEM by laterals	0.0%	as percent of maximum lateral in system			
% DIFFERENCE DISCHARGE for SYSTEM by square feet	0.0%	as percent of maximum square foot in system			

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

VOID VOLUME IN DELIVERY PIPE	11.42				
VOID VOLUME IN MANIFOLD	9.43	Volume from Manifold Design			
VOID VOLUME IN EACH LATERAL	4.82	4.82	0.00	0.00	0.00
TOTAL LATERAL VOID VOLUME	9.64				

MINIMUM DOSE VOLUME (based on void volume) 48.19 to 96.38 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 1.18 1.18

MAXIMUM TOTAL LATERAL HEADLOSS IN SYSTEM 1.18
 MANIFOLD HEADLOSS (center-fed unless manifold design) 0.74
 DELIVERY PIPE HEADLOSS 3.03 w/ delivery 2 inch diameter
 FITTING LOSS (headloss *.15) 0.53 add extra head if fittings are more than absolute minimum
 DISTAL PRESSURE HEAD 3.50
 STATIC HEAD (OFF-SWITCH TO HIGH LATERAL/MANIFOLD) -9.70
 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



ITT

GOULDS PUMPS Wastewater

APPLICATIONS

Specifically designed for the following uses:

- Homes, Farms, Trailer Courts, Motels, Schools, Hospitals, Industry, Effluent Systems

SPECIFICATIONS

Pump

- Solids handling capabilities: 3/4" maximum.
- Discharge size: 2" NPT.
- Capacities: up to 140 GPM.
- Total heads: up to 128 feet TDH.
- Temperature: 104°F (40°C) continuous, 140°F (60°C) intermittent.
- See order numbers on reverse side for specific HP, voltage, phase and RPM's available.

MOTORS

- Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.
- Class B insulation on 1/2 – 1 1/2 HP models.
- Class F insulation on 2 HP models.

Single phase (60 Hz):

- Capacitor start motors for maximum starting torque.
- Built-in overload with automatic reset.
- SJTOW or STOW severe duty oil and water resistant power cords.

- 1/2 – 1 HP models have NEMA three prong grounding plugs.
- 1 1/2 HP and larger units have bare lead cord ends.

Three phase (60 Hz):

- Class 10 overload protection must be provided in separately ordered starter unit.
- STOW power cords all have bare lead cord ends.
- **Designed for Continuous Operation:** Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage when fully submerged.
- **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. Standard cord is 20'. Optional lengths are available.
- **O-ring:** Assures positive sealing against contaminants and oil leakage.

AGENCY LISTINGS



Tested to UL 778 and CSA 22.2 108 Standards
By Canadian Standards Association File #LR38549
Goulds Pumps is ISO 9001 Registered.

