31-0-058102 2023 *Press Submit/Enter to continue or enter new parcel/tax year.*

Parcel	Account	Asmt year	Tax year	Type
31-0-058102	31464	2022	2023	RE

GIS

Primary owner	Hold tax statement	Escrow	Notes
124525 ANDERSON, BROCK & LEXI			
Taxpayer	**FALCO**	**Undeliverable tax address**	**Lease type**
124525 ANDERSON, BROCK & LEXI	1 F.O.	N	
Ref. parcel / Dept	**Commissioner dist**	**Emergency#**	**Surveyed**
00-2-310000581 Abstract	3		
Lake #/Name	**TIF district**	**MH court number**	**UDI**
			100.00%
Physical address	**TIF knock down date**	**User defined**	**Billing**
39336 355TH ST AITKIN MN 56431			P

Unique Taxing Area

UTA-Township/City	AMBU **** **** ****	Unit
31 SPENCER TWP	00 00 00 00	
School district	State UTA code	
1 ISD 0001 - Aitkin	32 1 00	

Property Description

version 2

Description	Acres	Lot	Block	Plat - Description
E 1/2 OF SW OF NE LYING N OF TWP RD	12.65			
	Sect/Twp/Range			
	30 47.0 26			

FIELD EVALUATION SHEET

PRELIMINARY EVALUATION DATE May 4, 2023, FIELD EVALUATION DATE May 4, 2023
PROPERTY OWNER: Brock & Lexi Anderson PHONE
ADDRESS: 39336 355th Street CITY,STATE,ZIP: Aitkin, Mn. 56431
LEGAL DESCRIPTION:
PIN# 00-2-310000 581 SEC 30 T 47 R 26 TWP NAME Spencer
FIRE# LAKE/RIVER — LAKE CLASS — OHWL FT

DESCRIPTION OF SOIL TREATMENT AREAS

	AREA #1	AREA #2
DISTURBED AREAS	YES NO X	YES NO X
COMPACTED AREAS	YES NO X	YES NO X
FLOODING	YES NO X	YES NO X
RUN ON POTENTIAL	YES NO X	YES NO X
SLOPE %	flat	6
DIRECTION OF SLOPE	—	S to N
LANDSCAPE POSITION	E-W	E-W
VEGETATION TYPES	Wooded	wooded

REFERENCE BM ELEV. 100 F
REFERENCE BM DESCRIPTION
Stake by corner of house

DEPTH TO STANDING WATER OR MOTTLED SOIL: BORING# 1 17", 1A 16", 2 13", 2A 14"

BOTTOM ELEVATION--FIRST TRENCH OR BOTTOM OF ROCK BED: #1 108 FT., #2 FT.

SOIL SIZING FACTOR: SITE # 1 2.67, SITE #2 2.67

CONSTRUCTION RELATED ISSUES: Soils must be dry. Cut trees & remove, then close cut the stumps. Do not drive on the sewer site area

LIC# 2132 SITE EVALUATOR SIGNATURE: Tom O'Neil

SITE EVALUATOR NAME: Tom O'Neil TELEPHONE# 218-927-6070

LUG REVIEW [illegible] DATE 5-9-23

Comments:

SOIL BORING LOGS ON REVERSE SIDE

SOILS CHARTS FOR BOTH PROPOSED AND ALTERNATE SITES

1 (PROPOSED) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR
0-6	Loam	10yr 2/2
6-14	Sandy Clay Loam	7.5yr 4/4
14-18	Clay Loam	10yr 5/2

Slight mottling at 17"

Very wet soils due to all the rain & snow

2 (PROPOSED) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR
0-6	Loam	10yr 2/2
6-15	Sandy Clay Loam	7.5yr 4/4
15-20	Clay Loam	10yr 5/2

slight mottling at 16"

1 (ALTERNATE) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR
0-11	Sandy Loam	10yr 2/2
11-15	Sandy Clay Loam	7.5yr 3/4

mottles at 13"

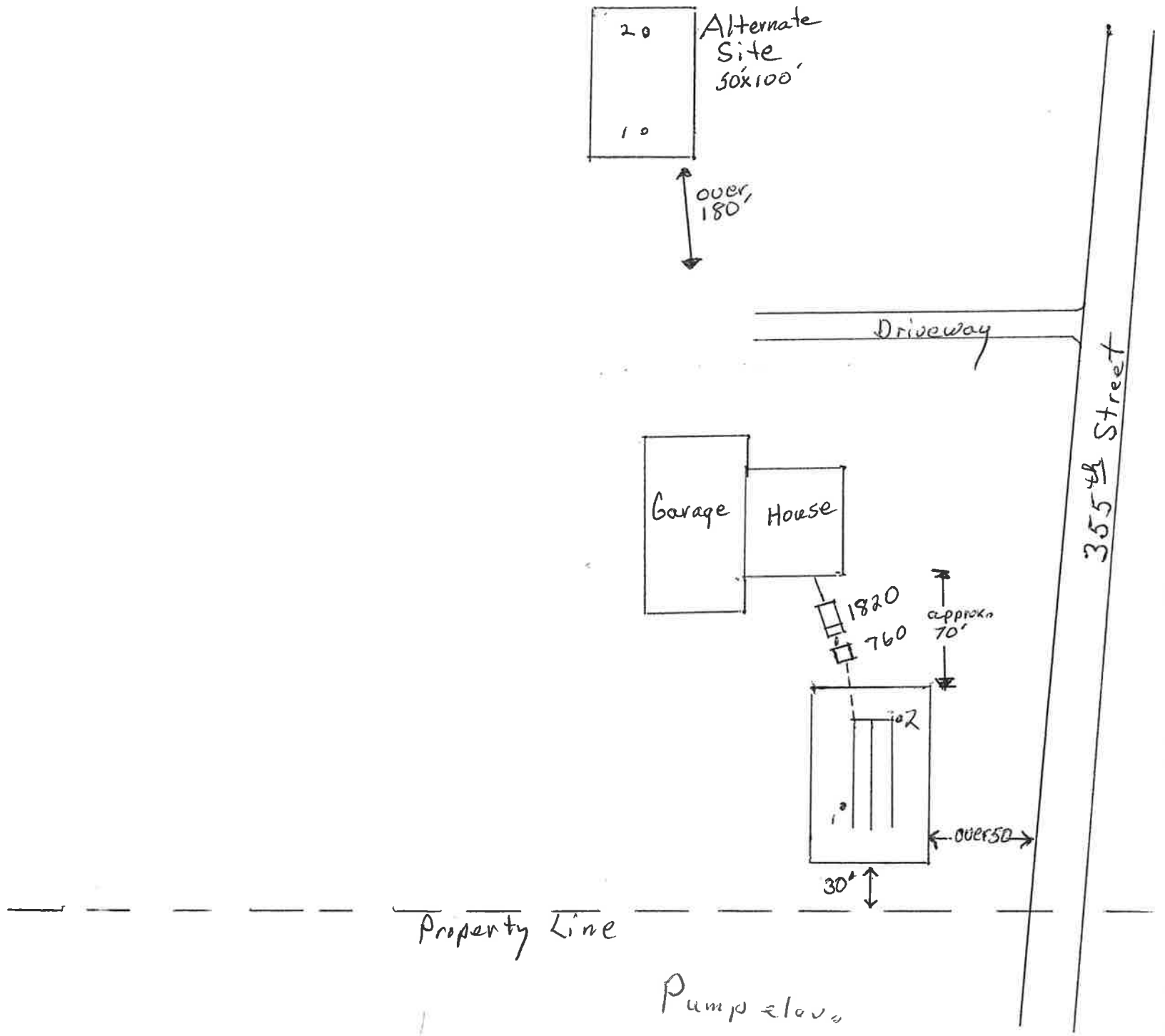
very wet soils

2 (ALTERNATE) SOILS DATA

DEPTH (INCHES)	TEXTURE	MUNSELL COLOR
0-7	Sandy Loam	10yr 2/2
7-14	Sandy Clay Loam	7.5yr 4/4
14-18	Clay Loam	7.5yr 6/2

Mottles at 14"

ADDITIONAL SOIL BORINGS MAY BE REQUIRED


20
Alternate Site 50x100'
10
over 180'
Driveway
355th Street
Garage
House
1820
760
approx 70'
102
10
over 50
30'
Property Line
Pump elev.

MOUND DESIGN WORK SHEET (For Flows up to 1200 gpd)

A. Average Design FLOW

Estimated 450 gpd *(see figure A-1)*
or measured _____ x 1.5 (safety *factor*) =_____ gpd

A-1: Estimated Sewage Flows in Gallons per Day

number of bedrooms	Class I	Class II	Class III	Class IV
2	300	225	180	60% of the values in the Class I, II, or III columns.
(3)	450	300	218	
4	600	375	256	
5	750	450	294	
6	900	525	332	
7	1050	600	370	
8	1200	675	408	

B. SEPTIC TANK Capacity

(Preferred 1820 with a 760 gallon Pump tank
_____ gallons *(see figure C-1)*

C. SOILS *(refer to site evaluation)*

1. Depth to restricting layer = 1.3 feet
2. Depth of percolation tests = 1.5 feet
3. Texture Sandy Clay Loam
   Percolation rate 46-60 mpi
4. Soil loading rate .45 gpd/sqft *(see figure D-33)*
5. Percent land slope Less than 1%

C-1: Septic Tank Capacities (in gallons)

Number of Bedrooms	Minimum Liquid Capacity	Liquid capacity with garbage disposal	Liquid capacity with disposal& lift inside
2 or less	750	1125	1500
3 or 4	1000	1500	2000
5 or 6	1500	2250	3000
7, 8 or 9	2000	3000	4000

D. ROCK LAYER DIMENSIONS

1. Multiply average design flow (A) by 0.83 to obtain required rock layer area.
   450 gpd x 0.83 sqft/gpd = 374 sqft
2. Determine rock layer width = 0.83 sqft/gpd x linear Loading Rate (LLR)
   0.83 sqft/gpd x 12 gpd/sqft = 10 ft
3. Length of rock layer = area ÷ width =
   374 sqft (D1) ÷ 10 ft (D2) = 38 ft

Mound LLR	
< 120 MPI	≤12
≥ 120 MPI	≤6

E. ROCK VOLUME

1. Multiply rock area (D1) by rock depth of 1 ft to get cubic feet of rock
   374 sqft x 1 ft = 374 cuft
2. Divide cuft by 27 cuft/cuyd to get cubic yards
   374 cuft ÷ 27 cuyd/cuft = 14 cuyd
3. Multiply cubic yards by 1.4 to get weight of rock in tons
   14 cuyd x 1.4 ton/cuyd = 19.6 tons

F. SEWAGE ABSORPTION WIDTH

Absorption width equals absorption ratio (See Figure D-33) times rock layer width (D2)

2.67 x 10 ft = 28 ft

D-33: Absorption Width Sizing Table

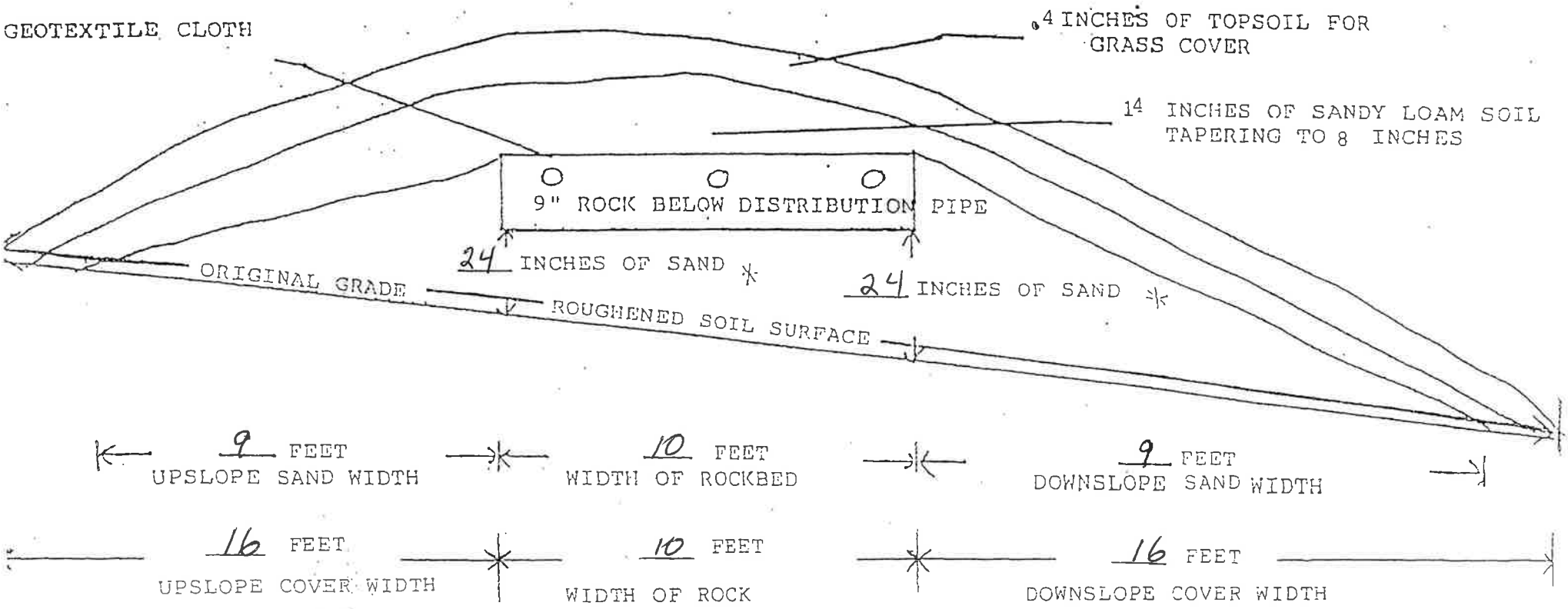
Percolation Rate in Minutes per Inch (MPI)	Soil Texture	Loading Rate Gallons per day per square foot	Absorption Ratio
Faster than 5	Coarse Sand Medium Sand Loamy Sand Fine Sand	1.20	1.00
6 to 15	Sandy Loam	0.79	1.50
16 to 30	Loam	0.60	2.00
31 to 45	Silt Loam Silt	0.50	2.40
46 to 60	Sandy Clay Loam Silty Clay Loam Clay Loam	0.45	(2.67)
61 to 120	Silty Clay Sandy Clay Clay	0.24	5.00
Slower than 120*			

*System designed for these soils must be other or performance

MOUND CROSS-SECTION

Flat under 1% PERCENT SLOPE OF ORIGINAL SOIL

10 FT. x 38 FT. SIZE OF ROCKBED 28 FT. x 56 FT. SIZE OF SANDBASE



ONSITE SEWAGE TREATMENT PROGRAM

G. Mound Slope Width and Length (landslope less than or equal to 1%)

<=1% land slope

1. Absorption width (F) 28 ft

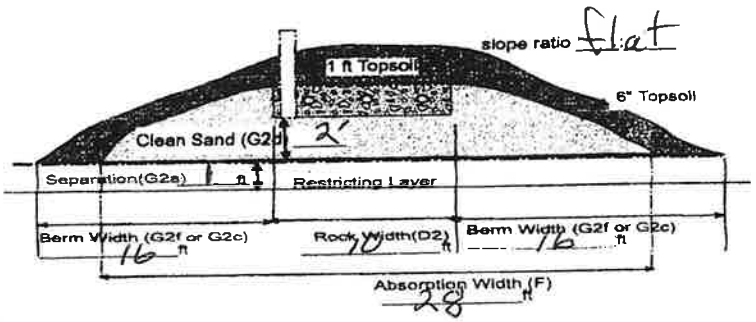
2. Calculate mound size

a. Determine depth of clean sand fill

at upslope edge of rock layer = 3 ft

minus the distance to restricting layer (C1)

3 ft - 1 ft = 2 ft



b. Mound height at the upslope edge of rock layer = depth of clean sand for separation (G2a) at upslope edge plus depth of rock layer (1 ft) plus depth of cover (1 ft)

2 ft + 1ft + 1ft = 4 ft

c. Berm width = upslope mound height (G2b) times 4 *(4 is recommended, but could be 3-12)*

4 x 4 = 16 ft

d. The total landscape width is the sum of berm (G2c) width plus rock layer width (D2) plus berm width (G2c): 16 ft + 10 ft + 16 ft = 42 ft

e. Additional width necessary for absorption = absorption width (F) minus the landscape width (G2d)

28 ft - 42 ft = — ft, ***if number is negative (<0) skip to g***

f. Final berm width = additional width (G2e) plus the berm width (G2c)

16 ft + 0 ft = 16 ft

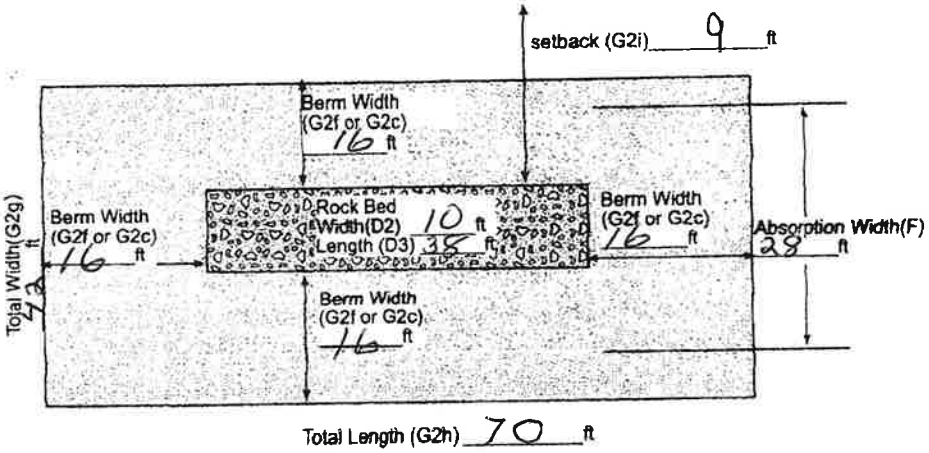
g. Total mound width is the sum of berm width (G2f or G2c) plus rock layer width (D2) plus berm width (G2f or G2c): 16 ft + 10 ft + 16 ft = 42 ft

h. Total mound length is the sum of berm (G2f or G2c) plus rock layer length (D3) plus berm (G2f or G2c): 16 ft + 38 ft + 16 ft = 70 ft

i. Setbacks from the rockbed are calculated as follows: the absorption width (F) minus the rock bed width (D2) divided by 2: (28 ft - 10 ft) ÷ 2 = 9 ft

Final Dimensions:

42 x 70



I hereby certify that I have completed this work in accordance with applicable ordinances, rules and laws.

Tom O'Neil (signature) 2132 (license #) May 4, 2023 (date)

PUMP SELECTION PROCEDURE

A. Determine pump capacity

Gravity distribution

1. Minimum is 10 GPM
2. Maximum is 45 GPM

1½" Pipe minimum

Pressure Distribution

3. a. Select number of perforated laterals 3.
   b. Select perforation spacing = 3 ft.
   c. Subtract 2 ft from rock layer length:
   38 - 2 = 36 feet.

ROCK LAYER LENGTH

   d. Determine the number of spaces between perfs:
   36 / 3 = 12 spaces
   (length of lateral) / (perf. spacing)
   e. 12 spaces + 1 = 13 perforations per lateral
   f. Multiply perforations per lateral by number of laterals to get total number of perforations:
   13 x 3 = 39
   (perfs/lateral) x (laterals) = (perforations)
   g. 39 X .74 = 29 GPM
   (Perforations) x (gpm/perfs)

SELECTED PUMP CAPACITY 29 GPM

B. Determine head requirements:

1. Elevation difference beteween pump & point of discharge: 15 feet max
2. If pumping to a pressure distribution system, add 5 feet; for gravity add zero: 5 feet
3. Friction Loss
   a. Enter friction loss table with GPM and pipe diameter. Read friction loss in feet per 100 ft in table.
   F.L. = 5.23 ft/100 of pipe
   b. Determine total pipe length from pump to discharge point. Add 25% to pipe length for fitting loss.
   40 length x 1.25 50 feet.
   c. Calculate total friction loss by multiplying friction loss in 100 ft. of pipe by equivalent pipe length (B):

Total friction loss = 5.23 x 50 /100 = 2.61

4. Total head required is the sum of the elevation difference, special head requirements and total friction loss:

15 (1) + 5 (2) + 3 (3c) **TOTAL HEAD** 23

SELECT A PUMP TO DELIVER AT LEAST 29 GPM WITH AT LEAST 23 FEET OF TOTAL HEAD.

If laterals are connected to a header pipe in a pressure system, select the minimum size lateral diameter; enter the table with perforation spacing and the number of perforations per lateral.

Select minimum size of lateral 1.5

For a center manifold system the values will be ½ of above.

Perforation Discharges in GPM

Head (feet)	Perforation diameter (inches) 7/32	1/4
1.0a	0.56	(0.74)
1.5	0.69	0.90
2.0b	0.80	1.04

a. Use 1.0 foot single homes
b. Use 2.0 feet for anything else

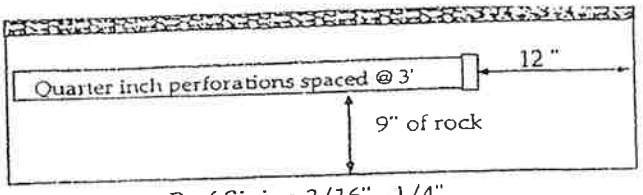
FRICTION LOSS IN PLASTIC PIPE

Flow Rate GPM	1.5"	2"	3"
20	2.47	0.73	0.11
25	3.73	1.11	0.16
30	(5.23)	1.55	0.23
35	6.96	2.06	0.30
40	8.91	2.64	0.39
45	11.07	3.28	0.48
50	13.46	3.99	0.58
55		4.76	0.70
60		5.60	0.82
65		6.48	0.95
70		7.44	1.09

Max. No. of 1/4" perfs per lateral. (10%var)

Perforation spacing. (feet)	1 1/4"	1 1/2"	2"
2.5 feet	14	18	28
3.0 feet	13	17	26
3.3 feet	12	16	25
4.0 feet	11	15	23
5.0 feet	10	14	22

PRESSURE DISTRIBUTION SYSTEM



Perf Sizing 3/16" - 1/4"
Perf Spacing 1.5'- 5'

1. Select number of perforated laterals 3

2. Select perforation spacing = 3 ft

3. Since perforations should not be placed closer than 1 foot to the edge of the rock layer (see diagram), subtract 2 feet from the rock layer length.

38 (Rock layer length) - 2 ft = 36 ft

4. Determine the number of spaces between perforations. Divide the length (3) by perforation spacing (2) and round down to nearest whole number.

Perforation spacing = 36 ft ÷ 3 ft = 12 spaces

5. Number of perforations is equal to one plus the number of perforation spaces(4). *Check figure E-4 to assure the number of perforations per lateral guarantees <10% discharge variation.*

12 spaces + 1 = 13 perforations/lateral

6. A. Total number of perforations = perforations per lateral (5) times number of laterals (1)

13 perfs/lat x 3 lat = 39 perforations

B. Calculate the square footage per perforation.
Should be 6-10 sqft/perf. *Does not apply to at-grades.*
Rock bed area = rock width (ft) x rock length (ft)
10 ft x 38 ft = 380 sqft
Square foot per perforation = Rock bed area ÷ number of perfs (6)
380 sqft ÷ 39 perfs = 9 sqft/perf

7. Determine required flow rate by multiplying the total number of perforations (6A) by flow per perforation *(see figure E-6)*

39 perfs x .74 gpm/perfs = 29 gpm

8. If laterals are connected to header pipe as shown on upper example, to select minimum required lateral diameter; enter figure E-4 with perforation spacing (2) and number of perforations per lateral (5) Select minimum diameter for perforated lateral = 1.25 inches. use 1½" pipe in mound

9. If perforated lateral system is attached to manifold pipe near the center, lower diagram, perforated lateral length (3) and number of perforations per lateral (5) will be approximately one half of that in step 8. Using these values, select minimum diameter for perforated lateral = 1 inches.

E-4: Maximum allowable number of 1/4-inch perforations per lateral to guarantee <10% discharge variation

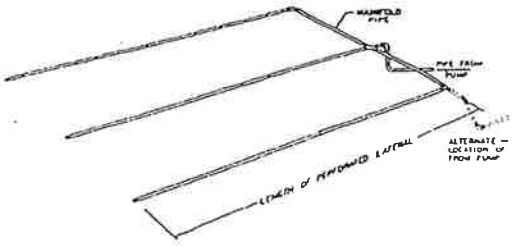
perforation spacing (feet)	1 inch	1.25 inch	1.5 inch	2.0 inch
2.5	8	14	18	28
3.0	8	13	17	26
3.3	7	12	16	25
4.0	7	11	15	23
5.0	6	10	14	22

E-6: Perforation Discharge in gpm

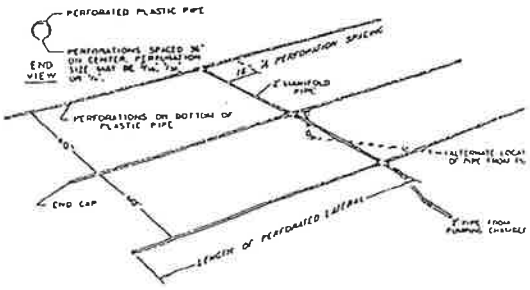
head (feet)	perforation diameter (inches) 1/8	3/16	7/32	1/4
1.0[a]	0.18	0.42	0.56	0.7[illegible]
2.0[b]	0.26	0.59	0.80	1.0[illegible]
5.0	0.41	0.94	1.26	1.6[illegible]

[a] Use 1.0 foot for single-family homes.
[b] Use 2.0 feet for anything else.

MANIFOLD LOCATED AT END OF PRESSURE DISTRIBUTION SYSTEM



LAYOUT OF PERFORATED PIPE LATERALS FOR PRESSURE DISTRIBUTION W MOUND



I hereby certify that I have completed this work in accordance with applicable ordinances, rules and laws.

Tom O'Neil (signature) 2132 (license #) May 4, 2022 (date)

CLIENT:_____ DATE:_____

MAP DRAWN TO SCALE [redacted] WITH A NORTH ARROW

See Sketch

CHECK OFF LIST--HAVE ALL OF THE FOLLOWING BEEN DRAWN ON THE MAP??

SHOW EXISTING OR PROPOSED

- ☐ WATER WELLS WITHIN 100 FT OF TREATMENT AREAS
- ☐ PRESSURE WATER LINES WITHIN 10 FT OF TREATMENT AREAS
- ☐ STRUCTURES ☐ LOT IMPROVEMENTS
- ☐ ALL SOIL TREATMENT AREAS ☐ ALL ISTS COMPONENTS
- ☐ HORIZONTAL AND VERTICALREFERENCE
- ☐ POINT OF SOIL BORINGS ☐ DIRECTION OF SLOPE
- ☐ LOT EASEMENTS ☐ ALL LOT DIMENSIONS
- ☐ DISTURBED/ COMPACTED AREAS
- ☐ SITE PROTECTION–LATHE AND RIBBON EVERY 15 FT
- ☐ ACCESS ROUTE FOR TANK MAINTENANCE

REQUIRED SETBACKS

- ☐ STRUCTURES ☐ PROPERTY LINES
- ☐ OHWL

COMMENTS:

INDICATE ELEVATIONS

BENCHMARK 100
ELEVATION OF SEWER LINE @ HOUSE 99
ELEVATION @ TANK INLET 97
ELEVATION @ BOTTOM OF ROCK LAYER 108
ELEVATION @ BOTTOM OF BORING OR RESTRICTIVE LAYER 14"
ELEVATION OF PUMP 92
ELEVATION OF DISTRIBUTION DEVICE 108.75

DESIGNER SIGNATURE Tom Orsini
LICENSE# 2132

DATE May 4, 2023