

Huffman Engineering & Surveying

537 College Ave.
Santa Rosa, California 95404
(707) 542-6559

Design Report

For

Joe Bettencourt

Owner

Joe Bettencourt
1717 North California Blvd Ste. #3A
Walnut Creek, CA 94597
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E: jbettencourt@interimhealthcare.com

Site

22144 Umland Circle
Timber Cove, CA
APN 109-420-003

July 13, 2021

Job# 21-065



TABLE OF CONTENTS

<u>Sheet</u>	<u>Description</u>
1	Design Report Narrative
3	Appendix "A" - Sewage Disposal System Calculations
6	Appendix "B" – Soils Exploration

HUFFMAN ENGINEERING & SURVEYING

537 College Avenue, Suite A, Santa Rosa, CA 95404

707-542-6559 www.huffmanengineering.net

July 22, 2021

County of Sonoma PRMD
Well and Septic Division
2550 Ventura Ave.
Santa Rosa, CA 95403

Attn: District Specialist

RE: Design Report
22144 Umland Circle
Timber Cove, CA
APN 109-420-003

Dear District Specialist,

Project Description:

This report is to accompany the sewage disposal system plans submitted for 22144 Umland Circle, Timber Cove. The parcel is an undeveloped, wooded parcel located in the community of Timber Cove. The terrain is gently sloping to steep with Redwood, Douglass Fir, Tan Oak and other trees and plans consistent with Coastal Woodlands. We have designed a Shallow Trench Pressure Distribution sewage disposal system to support a new single family residence. This system is designed for 4 bedrooms.

Soils Evaluations:

Soils evaluations were performed under permit number SEV91-1179. Soils were found to be Sandy Clay Loam to 24" over Clay Loam to 36" over Sandy Loam in Profile A and Sandy Loam to 16" over Clay Loam to 36" over Sandy Loam in Profile B. This area was approved as "Okay for PD" according to the county website.

Percolation Testing:

Percolation testing was performed under permit number SEV91-1178. The area was approved for a Shallow Trench Pressure Distribution sewage disposal system using an average percolation test rate of 18 minutes per inch.

Methodologies and Assumptions:

The system was designed using The County of Sonoma Onsite Wastewater Treatment System Regulations and Technical Standards (OWTS Manual) dated August 15, 2019. A soil application rate of 0.686 gallons per square foot per day was determined using Table 7.2a of the OWTS Manual

Proposed Sewage Disposal System:

We are proposing a Shallow Trench Pressure Distribution sewage disposal system, with 24” deep trenches with Infiltrator Equalizer chambers providing the equivalent of 9” of gravel, designed for 4 bedrooms. We propose that a 1500 gallon septic tanks. A 810 gallon sump tank be installed with an Orenco PF7510 pump capable of 70.1 gallons per minute at a total dynamic head of 35.5 feet. Dosing shall be 155 gallons per dose, the floats in an 810-gallon concrete tank (provided by Selvage Concrete Products) shall be set at 7” between on and off.

Primary System Calculations:

Daily Flow Rate (DFR) = 4 bedrooms @ 120 gallons/day/bedroom = 480 gallons per day

Soil Application Rate (SAR) = 0.686 Gal/sq. ft./day

Sidewall Depth = 9” infiltrator = .75’ x 2 = 1.5 square feet per lineal foot

Linear feet (LF) per bedroom = DFR/SAR/Sidewall depth =

(120 gallons/day/bedroom)/(0.686 gallons/sq. ft./day)/(1.5 sq. ft./LF) = 116 LF

116 LF/bedroom x 4 bedrooms = 464 LF

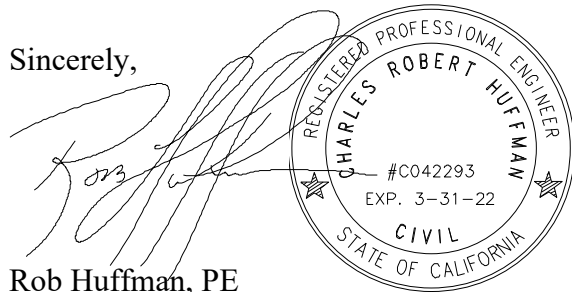
Reserve System Calculation:

100% expansion is required. Parcel was created as a part of Tract 340, Map of Timber Cove Properties filed in Book 103 of Maps at Page 11-25, dated March 5, 1965

Conclusion:

With proper installation and maintenance this system should function properly, support the uses proposed and protect the waters of the state.

Sincerely,



Rob Huffman, PE
Professional Engineer

RH:ejm
21-065 Design Report

Appendix "A"

Sewage Disposal System Calculations

- **Pump Calculations**
- **Dose Calculations**

Pump Selection for a Pressurized System - Single Family Residence Project

21-065



Parameters

Discharge Assembly Size	2.00	inches
Transport Length	30	feet
Transport Pipe Class	40	
Transport Line Size	2.00	inches
Distributing Valve Model	None	
Max Elevation Lift	3	feet
Manifold Length	55	feet
Manifold Pipe Class	40	
Manifold Pipe Size	1.25	inches
Number of Laterals per Cell	7	
Lateral Length	66	feet
Lateral Pipe Class	80	
Lateral Pipe Size	1.50	inches
Orifice Size	1/8	inches
Orifice Spacing	3	feet
Residual Head	5	feet
Flow Meter	None	inches
'Add-on' Friction Losses	7.12	feet

Calculations

Minimum Flow Rate per Orifice	0.43	gpm
Number of Orifices per Zone	161	
Total Flow Rate per Zone	70.1	gpm
Number of Laterals per Zone	7	
% Flow Differential 1st/Last Orifice	2.2	%
Transport Velocity	6.7	fps

Frictional Head Losses

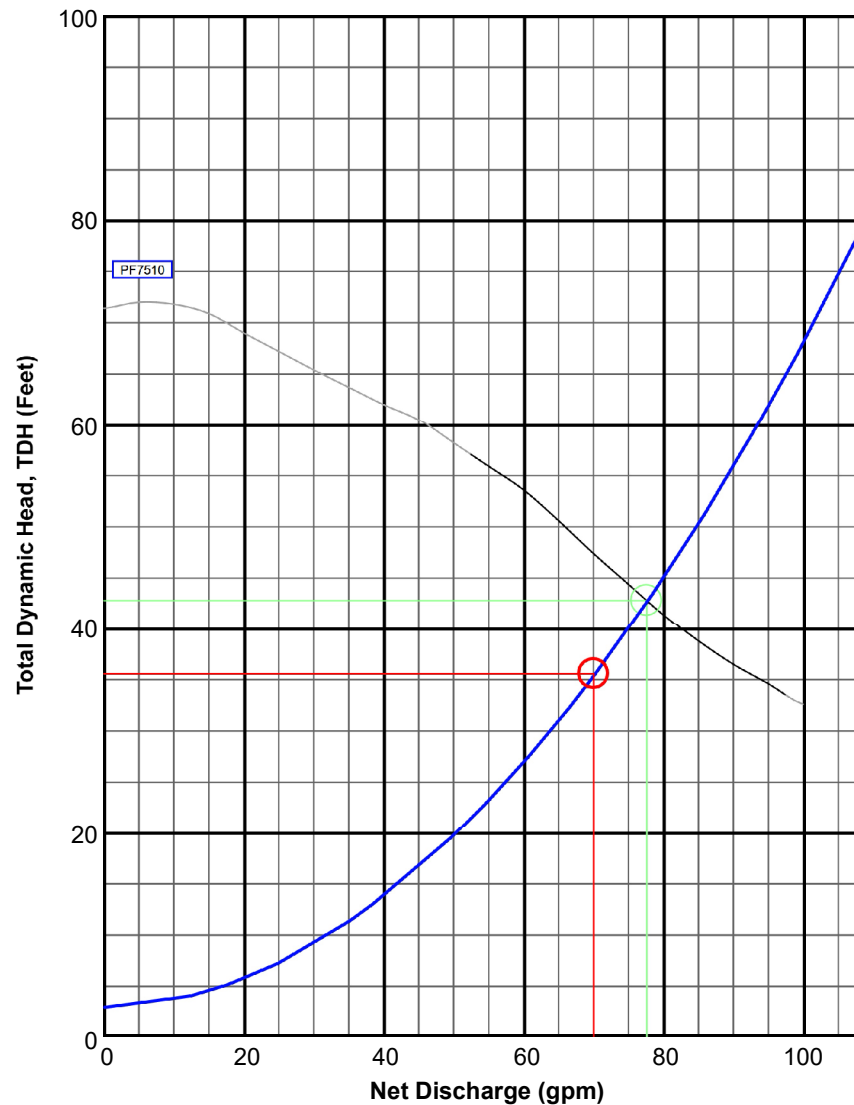
Loss through Discharge	9.8	feet
Loss in Transport	2.2	feet
Loss through Valve	0.0	feet
Loss in Manifold	8.1	feet
Loss in Laterals	0.2	feet
Loss through Flowmeter	0.0	feet
'Add-on' Friction Losses	7.1	feet

Pipe Volumes

Vol of Transport Line	5.2	gals
Vol of Manifold	4.3	gals
Vol of Laterals per Zone	42.4	gals
Total Volume	51.9	gals

Minimum Pump Requirements

Design Flow Rate	70.1	gpm
Total Dynamic Head	35.5	feet



Legend

System Curve:	—
Pump Curve:	—
Pump Optimal Range:	—
Operating Point:	○
Design Point:	○

PumpData

PF7515 High Head Effluent Pump
75 GPM, 1HP
230V 1Ø 60Hz

HUFFMAN ENGINEERING & SURVEYING	JOB #	21-065
537 COLLEGE AVE., SUITE A	SHEET #	1
SANTA ROSA, CALIFORNIA	CALCULATED BY	EJM
(707) 542-6559	DATE	7/22/2021

DOSING CALCULATIONS FOR PRESSURIZED SYSTEMS

A	LENGTH OF DISTRIBUTION LATERALS (TOTAL)	=	466'
B	SIZE OF DISTRIBUTION LATERAL	=	1-1/2
C	VOLUME OF LATERAL PER FOOT	=	0.10 Gallon
J	VOLUME IN LATERALS (AxC)	=	46.60 Gallon
N	DOSE VOLUME ((Jx10)+M)	=	233 Gallon
O	SIZE OF TANK	=	2000 Gallon
P	LENGTH OF TANK (INCHES)	=	150
Q	WIDTH OF TANK (INCHES)	=	78
R	DIFFERENCE BETWEEN ON AND OFF FLOATS	=	4 10/16

Per size, inches	Volume in gallons per foot of
3/4	0.02
1	0.04
1-1/4	0.07
1-1/2	0.1
2	0.17
2-1/4	0.24
3	0.38
4	0.65

Appendix "B"

Soils Evaluation

- **County Files**



COUNTY OF SONOMA
PUBLIC HEALTH DEPARTMENT
ENVIRONMENTAL HEALTH SERVICES

MARK A. KOSTIELNEY
 Director of Public Health
 GEORGE R. FLORES, M.D.
 Health Officer

1030 CENTER DRIVE, SUITE A • SANTA ROSA • CALIFORNIA 95403-2067 • TELEPHONE (707) 525-6500

HE Date 4-29-92

EH-097

876 Gravenstein Hwy So.
Seb Ca 95472

cc Bohan, Canellis
 Bx 314
 Caz Ca 95421

Subject: **SOILS PERCOLATION TESTING**

A.P.# 109 420 03
 Address: 22144 Umland Cir
 Name: E Samuelson

Your soil percolation test report for the subject property has been reviewed and preliminary evaluations of the data indicate the potential for an alternative sewage disposal system within the innovative program.

The site is acceptable to install an R.E.H.S. or R.C.E. designed PO
advoid pits w/ < 120 mpi.

Site investigation should be arranged with the undersigned to further evaluate the site to install a R.E.H.S. or R.C.E. designed _____

No construction permits until TC
water co. is in compliance w/ health &
safety codes.

____ Please complete a site survey form, submit required fee, and arrange for a site evaluation.

Please call the undersigned at (707) 525 6506 for further informations.

Sincerely,

DM DONOVAN R.E.H.S.

Enclosure: Request for Service form

White copy - Owner Yellow copy - Office Pink copy - Engineer

HUFFMAN ENGINEERING

876 GRAVENSTEIN HWY. SO., SEBASTOPOL, CA 95472 (707) 823-2190

March 25, 1992

Sonoma County Environmental Health Dept.
1030 Center Drive, Suite "A"
Santa Rosa, California 95403

Attn.: Mr. Dave Donovan, R.E.H.S.

Re: Percolation test certification at 22144 Umland Circle,
Timbercove.

Dear Dave,

Description of tested area:

The tested area is located in an upland sideslope landscape formation. There are Tan Oaks, Pines and Redwood trees within the tested area. The soil mantle was investigated in two profile pits, "A" and "B". The soil mantle appeared to support a pressure distribution type septic system and possibly a standard system if the rates are acceptable. The tested area is constrained by property lines to the North and steeper than 20% slopes to the South.

Results of testing:

The percolation testing supported our observations for a pressure distribution type system of the soil mantle. A hydrometer test revealed that the soil extracted from Profile "A" at 24" was a Sandy Loam located in Zone 2 of the U.S.D.A. soil texture chart.

The following are the tests used in sizing the system.

<u>Hole #</u>	<u>Depth (in.)</u>	<u>Rate (m.p.i.)</u>
2	24"	1
5	24"	80
7	24"	6
10	24"	1
12	24"	5

Average Rate = 18.6 m.p.i.

The following test holes and rates address the depth of soil criteria:

<u>Hole #</u>	<u>Depth (in.)</u>	<u>Rate (m.p.i.)</u>
1	52"	80
6	52"	120
8	52"	120
11	52"	120

Average Rate = 110 m.p.i.

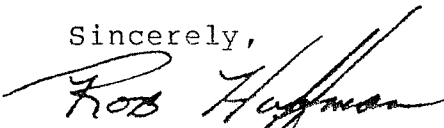
System Recommendations:

It is recommended to design a pressure distribution system at 24" deep with 12" of gravel per lineal foot of trench utilizing 1.6 square feet of trench sidewall per linear foot of trench. Utilize 1.2 gallons/square foot/day application rate. Use 62 lineal feet per bedroom in the design.

I viewed and logged the profile holes, viewed a portion of the percolation test and reviewed the percolation test data. I have determined that they are true, accurate and indicative of the site for an on-site sewage disposal system as measured by the current standards of the Sonoma County Environmental Health Department.

If you have any questions, please call me at 823-2190. Thank-you.

Sincerely,

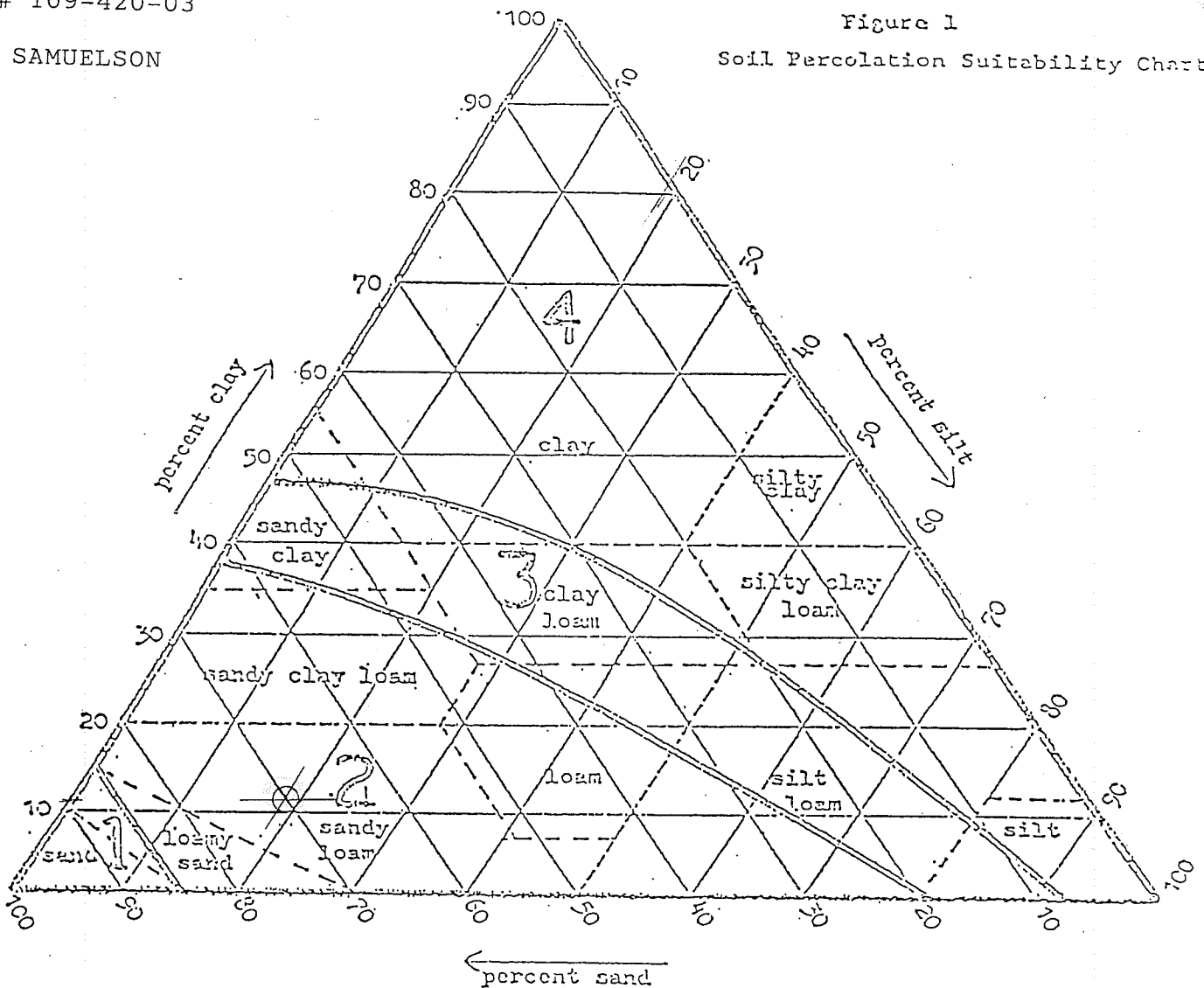


Rob Huffman, P.E.
Professional Civil Engineer

RH:th:enc.
91-96

Hole Number	Depth of Hole	Pipe Length	Presoak Remaining	Start		First Measurement		Second Measurement		Third Measurement		Fourth Measurement		Fifth Measurement		Sixth Measurement		Time
				Time	Inches	Time	Inches	Time	Inches	Time	Inches	Time	Inches	Time	Inches	Time	Inches	
1	52	50	0	9 ⁴⁰	38	10 ⁴⁰	41 ^{1/4}	11 ⁴⁰	42 ^{5/8}	12 ⁴⁰	43 ^{5/8}	1 ⁴⁰	44 ^{1/2}	2 ⁴⁰	45 ^{3/8}	3 ⁴⁰	46 ^{1/8}	80
2	24	32	0		20		D/		SEE		TEN		MIN		TEST			1
3	88	5	0		17		12		9 ^{7/8}		8 ^{1/8}		6 ^{1/2} 17		13 ^{1/2}		11 ^{1/2}	37
4	52	85	2"		74		76 ^{1/8}		77 ^{3/8}		78 ^{1/4}		78 ^{3/4}		79 ^{1/8}		79 ^{1/2}	160
5	24	101	0		89		94 ^{3/8}		96		97 ^{3/8}		98 ^{1/2}		99 ^{1/4} 89		93 ^{3/8}	80
6	52	98	0		86		89 ^{1/8}		90 ^{1/4}		91		91 ^{3/4}		92 ^{1/2}		93	120
7	24	2 ^{1/2}	0		9 ^{1/2}		20 ^{1/4} 9 ^{1/2}		20 ^{1/8} 9 ^{1/2}		20 ^{1/4} 9 ^{1/2}		20 ^{1/4} 9 ^{1/2}		19 ^{3/4} 9 ^{1/2}		19 ^{3/4}	6
8	52	53	10"		41		42 ^{1/8}		42 ^{7/8}		43 ^{3/8}		43 ^{7/8}		44 ^{3/8}		44 ^{7/8}	120
9	88	24	0		12		19 ^{3/4}		22 ^{1/2}		16 ^{1/2}		18 ^{1/2}		20		21	60
10	24	53	0		41		D/		SEE		TEN		MIN		TEST			1
11	52	80	1"		68		70 ^{3/4}		71 ^{1/2}		72		72 ^{5/8}		73 ^{1/8}		73 ^{5/8}	120
12	24	5	0		17		TRACE 17		1/17		1/17		1/17		1/17		TRACE	5
13	52	89	4"		77		79 ^{5/8}		80 ^{1/4}		80 ^{3/4}		81 ^{1/4}		81 ^{1/2}		81 ^{3/4}	240
14	24	38	0		26		1/26		1/26		1/26		1/26		1/26		TRACE	5
2	24	32	0	10 ⁵⁵	20	11 ⁰⁵	D/20	11 ¹⁵	D/20	11 ²⁵	D/20	11 ³⁵	D/20	11 ⁴⁵	D/20	11 ⁵⁵	D/20	
						12 ⁰⁵	D/20	12 ¹⁵	D/20	12 ²⁵	D/20	12 ³⁵	D/20	12 ⁴⁵	D/20	12 ⁵⁵	D	1
10	24	53	0		41		D/41		D/41		D/41		D/41		D/41		D/41	
							D/41		D/41		D/41		D/41		D/41		D	1

Figure 1
Soil Percolation Suitability Chart



Sieve Openings in Inches	U. S. Standard Sieve Numbers
3	10
2 1/2	20
1 3/4	40
1 1/4	60
3/4	200

USDA	GRAVEL	SAND					SILT	CLAY
		Very Coarse	Coarse	Medium	Fine	Very fine		

Grain Size In Millimeters
100
50
10
5
2
1
0.5
0.425
0.25
0.1
0.075
0.05
0.02
0.01
0.005
0.002
0.001

Instructions:

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
Adjust for coarse fragments by moving the plotted point in the sand direction an additional 2% for each 10% (by volume) of fragments greater than 2mm in diameter.
3. Adjust for compactness of soil by moving the plotted point in the clay direction an additional 1.5% for soils having a bulk-density greater than 1.7 gm/cc.

Herzog Associates
Geoscientists

1318 Redwood Way, Suite 200
Petaluma, CA 94954
Tel (707) 792-5600
Fax (707) 792-5695

February 27, 1992
Job No. 6249.1-0-8

HERZOG
HERZOG

A member of the **HHH** group of companies

CANELIS
P.O. Box 186
Cazadero, California 95421
Attention: Mr. Theseus Canelis

RE: Laboratory Test Results
Soil Texture Analysis by
Bouyoucos Hydrometry Method
SAMUELSON

This letter transmits the results of our laboratory testing performed for the subject project. The samples were picked up on February 25, 1992 by our personnel.

We performed a Soil Texture Analysis by the Bouyoucos Hydrometry Method with the following results:

Size/Density	A @ 24"
+ #10 Sieve	0.8
Sand	69.4
Clay	11.8
Silt	18.8
DB g/cc	----

We trust this provides the information required at this time. Should you have further questions, please call.

Yours very truly,
HERZOG ASSOCIATES



Scott W. Hogue
Laboratory Manager