



TECHNICAL MEMORANDUM

Onsite Sewage Disposal System Design
Davis Residence

Date: September 12, 2023

Prepared For: Randy & Shelly Davis

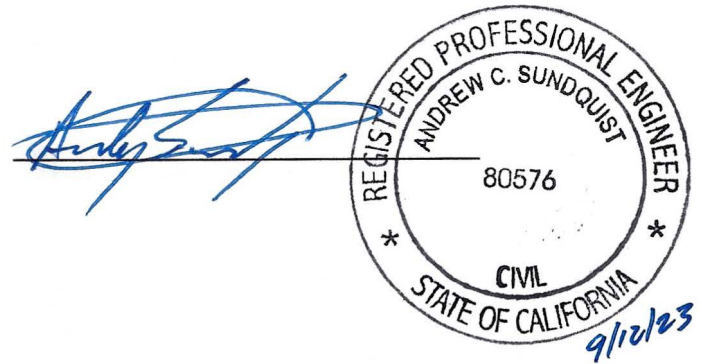
Prepared By: Andy Sundquist, PE

Appendix 1: Site Plan & System Layout

Appendix 2: Laboratory Test Results

Appendix 2: Soil Logs

Appendix 3: Percolation Test Results



1.0 INTRODUCTION AND PROJECT DESCRIPTION

The Davis's are currently in the planning and design phase of a new three-bedroom residential unit and an Additional Dwelling Unit (ADU) on a five-acre parcel (APN 511-491-021) located at 2427 Elizabeth Drive in McKinleyville, in the county of Humboldt, California.

The proposed primary structure is a three-bedroom, single family home approximately 2,000 square feet in size with an attached garage, the proposed 490 square foot ADU is a one-bedroom residential structure. Due to the absence of a public sewer system in the area, a conventional septic and disposal field system is being proposed for both units.

2.0 PROJECT LOCATION

The subject parcel is approximately 5-acres in size and located at located at 2427 Elizabeth Drive in McKinleyville, in the county of Humboldt, California. To access the site, from McKinleyville, head east on Murray Road, turn left on Elizabeth Drive, the subject parcel is approximately 0.6 miles out Elizabeth Drive.

3.0 SITE DESCRIPTION

The project area is located at the base of a small hill to the north on relatively flat ground slightly sloping from the west to east. The existing ground surface consists of grass/pastureland with clusters of fir and spruce trees. The parcel is surrounded by similar parcels in size and topography. There are no streams, surface water, or wetlands located on the subject parcel or within 100 feet of the proposed or reserve disposal fields. Water is served by an existing private water well approximately 500 feet north of the parcel on the neighboring parcel.

4.0 SITE EVALUATION

On the morning of July 27, 2023, a site visit was performed to observe existing site conditions and excavate several soil test pits. Two test pits were excavated to the north and south of the proposed primary building site with an excavator to a depth of 10-feet below ground surface in the area of the proposed primary and reserve disposal fields. Subsurface soils consisted predominantly of clay loam with organics located in the top two feet. During the time of the excavation, no groundwater was encountered, soil was uniform, and no evidence of mottling was observed.

5.0 PERCOLATION TEST DATA

Percolation tests were performed on August 24th, tests were performed at a depth of 24-inches below ground surface, The percolation test data resulted in an average **percolation rate of 30-minutes-per-inch for test Hole #1 and Test Hole #2**. The preferred location is in the location of Test Hole #2. Percolation test results for the preferred location, test Hole #2, is displayed below, Test Hole #1 results can be found in in Appendix 4.

Table 1. Test Hole #2 Percolation Test Results

Percolation Test Results					
Reading Number	Time	DURATION (MIN)	READING (IN)	DROP (IN)	RATE (MPI)
	905		0		
1	920	15	2 1/2	2 1/2	6.00
2	935	15	3 1/4	3/4	20.00
3	950	15	4 3/8	1 1/8	13.33
4	965	15	4 3/4	3/8	40.00
5	980	15	5	1/4	60.00
6	995	15	5 1/2	1/2	30.00
7	1010	15	6	1/2	30.00
8	1025	15	6 1/2	1/2	30.00
9	1040	15	7	1/2	30.00

6.0 DISPOSAL SYSTEM DESIGN CALCULATIONS

Utilizing Humboldt County Health and Human Services Department of Public Health's *Onsite Wastewater Treatment System Regulations and Technical Manual*, and an estimated flow rate of 150-gallons per day per bedroom up to three bedrooms, and 75-gallons per day for each additional bedroom, the proposed septic

system will be sized for an **average daily flow of 450-gallons for the primary residence and 300-gallons for the ADU.**

Table 2. Minimum Required Septic Tank Volume

Required Tank Volume	Intended Use
750 gallons	1-bedroom Cabin/Mobil Home
1200 gallons	2-Bedroom Residence
1500 gallons	3-4-Bedroom Residence
Three Times Daily Flow	Other Applications (E.g. Commercial, multi-family, etc.)

Using Table 2. Soil Application Rates in the Humboldt County Onsite Wastewater Treatment System Regulations and Technical Manual and a **30-minutes-per-inch percolation rate**, absorption area and trench lengths can be calculated as shown below.

Table 3. Minimum Required Absorption Area and Trench Length for Primary and Reserve Disposal Field

Hum. Co. OWTS Table 2 Application Rate (gpd/ft ²)	Estimated Daily Flow Rate (gal)	Minimum Absorption Area (ft ²)	Minimum Absorption Trench Length ¹ (ft)
0.363	450	1,240	207

1. Assumes 6-ft² of infiltrative trench surface per linear foot of trench

Using Table 2. Soil Application Rates in the Humboldt County Onsite Wastewater Treatment System Regulations and Technical Manual and a **30-minutes-per-inch percolation rate**, absorption area and trench lengths can be calculated as shown below for the ADU.

Table 4. Minimum Required Absorption Area and Trench Length for ADU Disposal Field

Hum. Co. OWTS Table 2 Application Rate (gpd/ft ²)	Estimated Daily Flow Rate (gal)	Minimum Absorption Area (ft ²)	Minimum Absorption Trench Length ¹ (ft)
0.363	300	826	138

1. Assumes 6-ft² of infiltrative trench surface per linear foot of trench

7.0 PRIMARY & RESERVE DISPOSAL FIELD AND SYSTEM LAYOUT

Table 5. Setback Requirements

Minimum Horizontal Distance (ft)	Public Water Well	Private Water Well	Surface Intake Public Water	Perennial Stream, Wetland & Other Waters	Ephemeral Stream or Drainage Swale
Septic Tank	100	100		50	25
Pump Tank	100	100		50	25
Dispersal System	150	100	200-400	100	50

Minimum Horizontal Distance (ft)	Property Lines Public Water	Property Lines Private Water	Buildings of Structures	Cut Banks Unstable Land Steep Slopes >30%	Large Tress
Septic Tank	5	25	5	25	10
Pump Tank	5	25	5	25	10
Dispersal System	10	50	10	25	10

For the primary disposal field for the primary residence a minimum of a 1,500-gallon dual-chambered septic tank of either concrete or polyethylene construction shall be installed in accordance with the minimum setback requirements listed in Table 5 above. The disposal field will require an area that is 40-feet wide by 42-feet long (1,680 ft²). A distribution box shall connect the supply line to the absorption trenches. The absorption field will consist of five (5) total absorption trenches at 42-feet in length for a total of 210-feet of absorption trench. All trenches shall be spaced horizontally at ten (10) feet on center and contain 4-inch drainpipe with perforated inverts. Trenches shall be sixty (60) inches deep and eighteen (18) inches wide. The drainpipe invert shall be installed at a depth of twenty-four (24) inches below existing grade to allow for sufficient gravity fall from the septic tank to the distribution box. The required grade should be verified in the field by the contractor installing the system. The trenches are to be backfilled with 24-inches of native top-soil, mounded a minimum of 6-inches to allow for settlement and additional pipe cover. See Appendix 1 for proposed layout and typical trench details. The reserve area shall be the same dimensions as the primary field.

The ADU disposal field will require an area that is 30-feet wide by 35-feet long (1,050 ft²) and contain four (4) total absorption trenches at 35-feet in length for a total of 140-feet of absorption trench. Trenches shall be constructed in the same manner as the primary residence stated above. The reserve area shall be the same dimensions as the ADU primary field.

Table 5. Primary Residence System Summary

Septic Tank				
Minimum 1,500-gallon dual-chambered, constructed of polyurethane or concrete				
Disposal Field				
Trench Type	Number of Trenches	Trench Length (FT)	Trench Depth (IN)	Trench Width (IN)
Traditional Gravel Filled Trench	5	42	60	18

Table 6. ADU System Summary

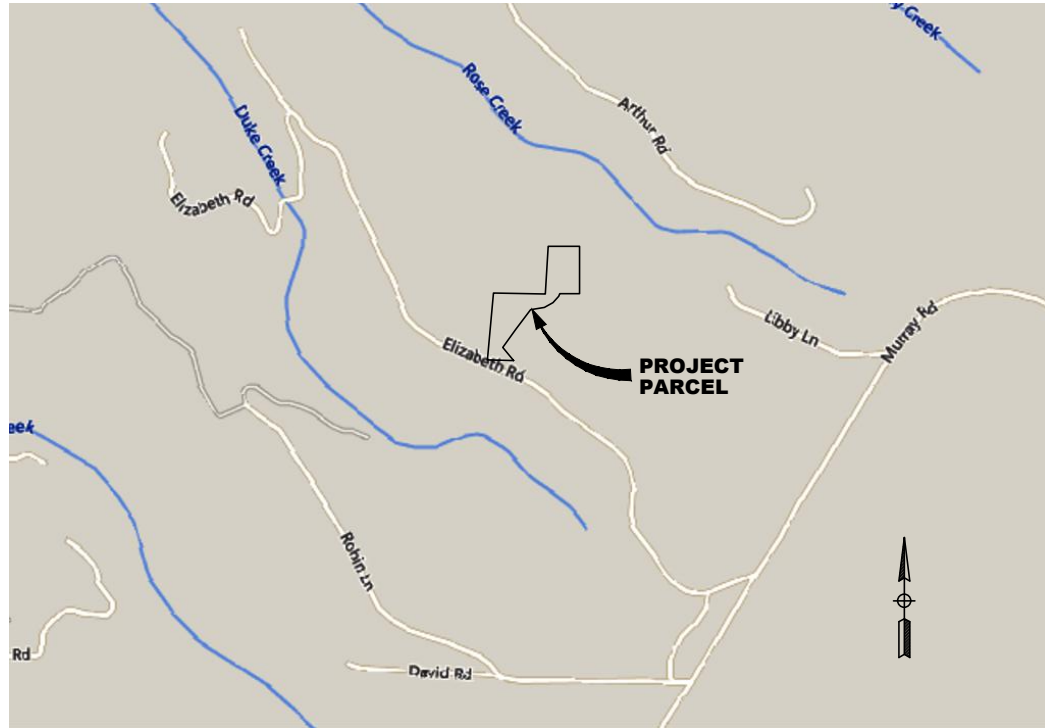
Septic Tank				
Minimum 1,200-gallon dual-chambered, constructed of polyurethane or concrete				
Disposal Field				
Trench Type	Number of Trenches	Trench Length (FT)	Trench Depth (IN)	Trench Width (IN)
Traditional Gravel Filled Trench	4	35	60	18

APPENDIX 1

Site Plan and System Layout

NEW HOUSES

**AOB 2,184 SF LIVING SPACE
& 780 SF GARAGE,
ADU 490 SF LIVING SPACE
2427 ELIZABETH ROAD
McKINLEYVILLE, CA 95519
APN: 511-491-021**



NOTES:

1. ALL LOCATIONS ARE APPROXIMATE. NO SURVEY WAS CONDUCTED FOR THIS PROJECT.
2. PROPERTY LINES ARE FROM POINTS WEST SURVEYING CO. TENTATIVE MAP DATED APRIL 2022.
3. CONTOURS SHOWN HEREON ARE APPROXIMATE.
4. IMAGE SHOWN HEREON IS FROM BING.
5. 25 ALDER TREES UNDER 12" AND 5 FIR TREES 18" - 24" WILL BE REMOVED FOR THIS PROJECT.

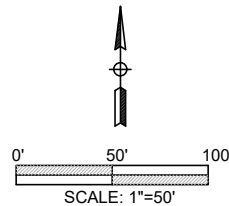
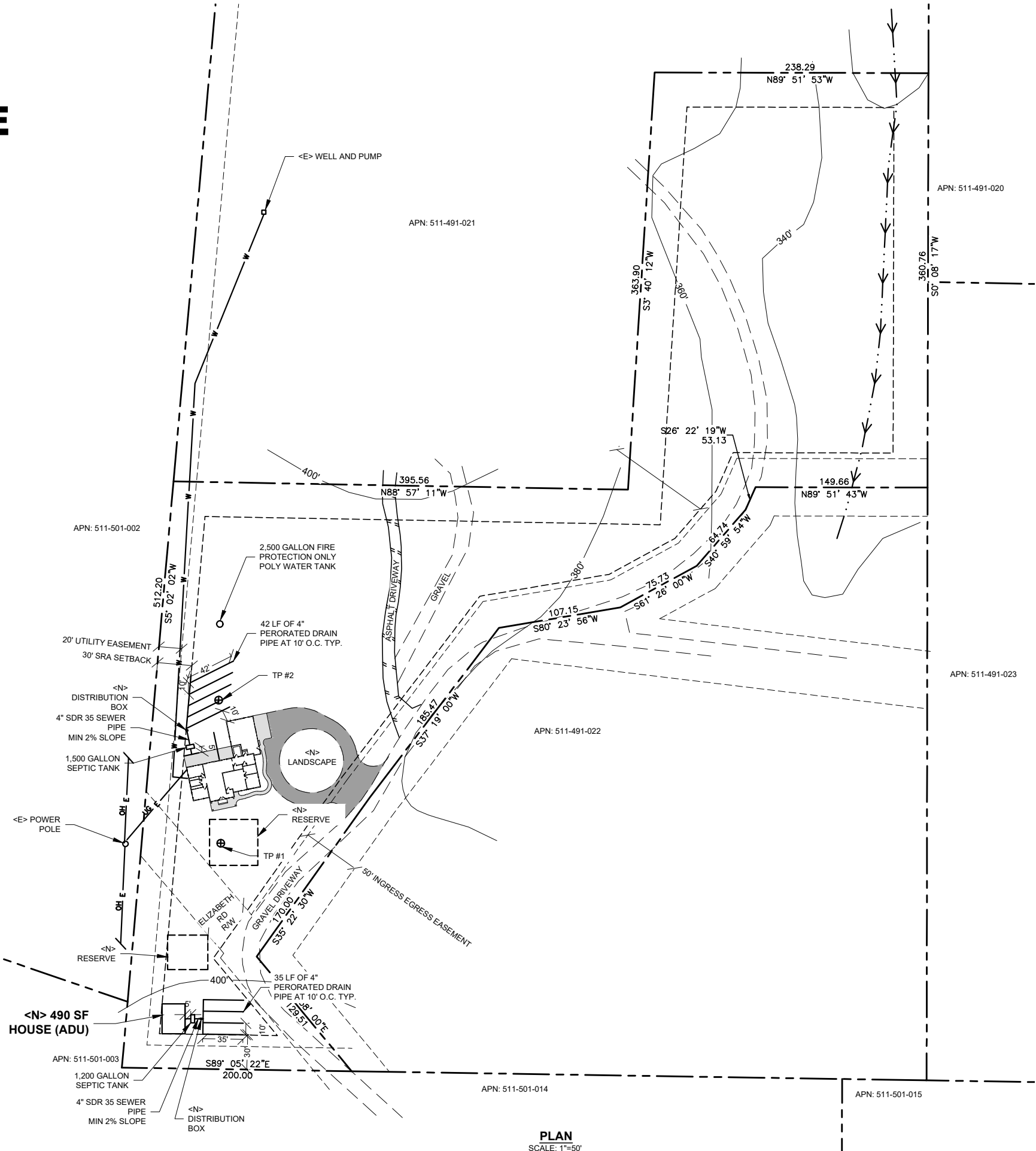
**VICINITY MAP
NOT TO SCALE**

OWNER INFORMATION:

OWNER: RANDY & SHELLI DAVIS
PHONE: 707-407-8701

SITE INFORMATION:

5 ACRES
SRA: YES



**PLAN
SCALE: 1"=50'**



**CANDOR ROCK
INC.**
(707) 496-5360 andy@candorrock.com


NO.	HISTORY / REVISION	BY / CHK.	DATE

**AOB - NEW HOUSE
2427 ELIZABETH ROAD MCKINLEYVILLE, CA 95519
SEPTIC SYSTEM LAYOUT
APN: 511-491-021**

DRAWN	ACS
CHECK	ACS
APPROVED	ACS
DATE	9/14/2023
JOB NUMBER	7.13.2023
SHEET	C1.0

APPENDIX 2

Laboratory Test Results

 <p>21 W. 4th Street Eureka CA 95501</p>	TEXTURAL ANALYSIS		Page 1	Project No. 7010.31
	Project Elizabeth Road		Tested By SLC	Date 8/4/2023
	Location McKinleyville		Checked By	Date
	Client Strombeck Properties		Sample ID: 23-058EK	

Sample Location	Sample Depth	Total Sample (gm)	Retained on #10 Sieve (gm)	Passing #10 Sieve (gm)	Retained on #10 Sieve (%)	Passing #10 Sieve (%)	Coarse Adjustment (%)
TP-1	2.5'	802.3	3.0	799.3	0.4	99.6	0.0
TP-2	2.5'	665.1	20.1	645.0	3.0	97.0	0.2

WORK SHEET FOR SOIL TEXTURE (Water Quality Control Board Method)

TP-1	TP-2		
2.5'	2.5'		
71.0	90.1		
8:41:00 AM	9:35:00 AM		
73	72		
59	57		
-5.5	-5.7		
54	51		
72	72		
27	36		
-5.7	-5.7		
21	30		
24.6	43.1		
30.0	33.6		
45.4	23.3		
Clay Loam	Clay Loam		
3	3		
75.4	56.9		

SAMPLE DESCRIPTION

SAMPLE DEPTH

- A. Ovendry Weight (gm)
- B. Starting Time (hr: min: sec)
- C. Temp @ 40 sec. (°F)
- D. Hydrometer Reading @ 40 sec. (gm/l)
- E. Composite Correction (gm/l)
- F. True Density @ 40 sec. (gm/l), (D - E)
- G. Temp. @ 2 hrs. (°F)
- H. Hydrometer Reading @ 2 hrs. (gm/l)
- I. Composite Correction (gm/l)
- J. True Density @ 2 hrs. (gm/l), (H - I)
- K. % Sand = $100 - [(F/A) \times 100]$
- L. % Clay = $(J/A) \times 100$
- M. % Silt = $100 - (K+L)$
- N. USDA Texture
- O. Soil Percolation Suitability Chart Zone
- P. Combine % Silt and Clay



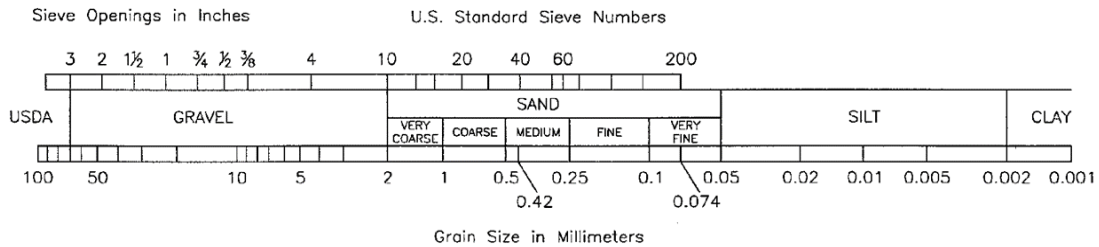
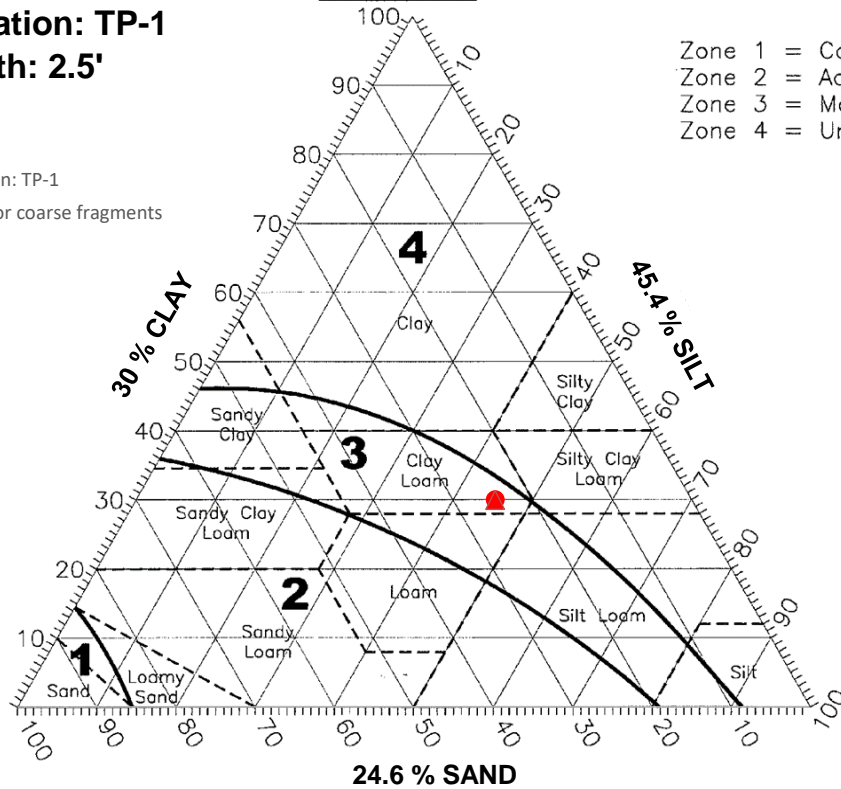
SOIL SUITABILITY CHART		Page 2	Project No. 7010.31
Project Elizabeth Road	Tested By SLC	Date 8/4/2023	
Location McKinleyville	Checked By 0	Date 1/0/1900	
Client Strombeck Properties	Sample ID: 23-058EK		

SOIL PERCOLATION SUITABILITY CHART

Sample Location: TP-1
Sample Depth: 2.5'

- Sample Location: TP-1
- ▲ Adjusted 0 % for coarse fragments

- Zone 1 = Coarse
- Zone 2 = Acceptable
- Zone 3 = Marginal
- Zone 4 = Unacceptable



INSTRUCTIONS:

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. 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 15% for soils having a bulk-density greater than 1.7 gm/cc.



SOIL SUITABILITY CHART

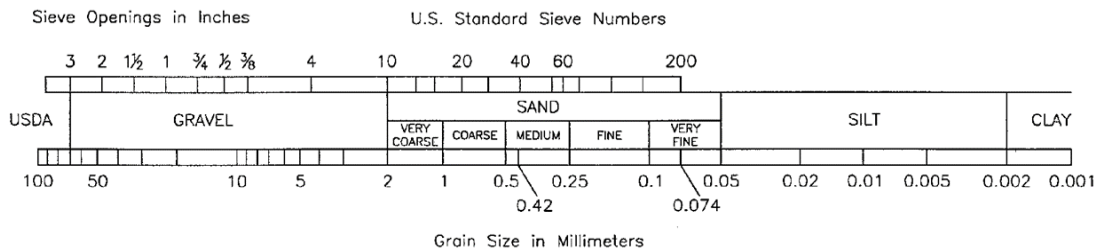
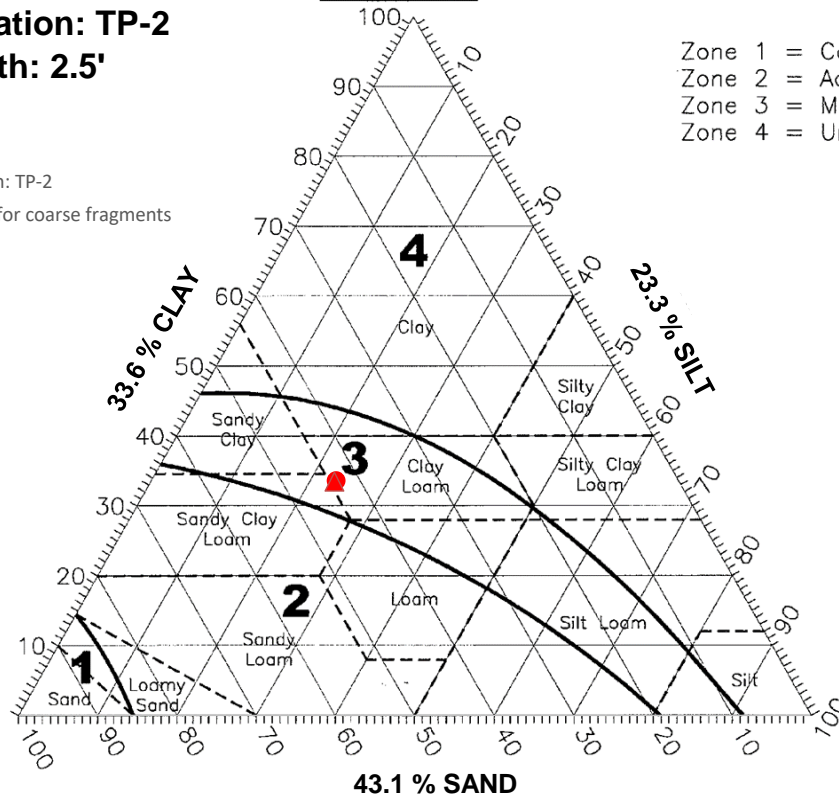
Page	2	Project No.	7010.31
Project	Elizabeth Road	Tested By	SLC
Location	McKinleyville	Checked By	0
Client	Strombeck Properties	Date	8/4/2023
		Date	1/0/1900
		Sample ID:	23-058EK

SOIL PERCOLATION SUITABILITY CHART

Sample Location: TP-2
Sample Depth: 2.5'

Zone 1 = Coarse
Zone 2 = Acceptable
Zone 3 = Marginal
Zone 4 = Unacceptable

- Sample Location: TP-2
- ▲ Adjusted 0.2 % for coarse fragments



INSTRUCTIONS:

- 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.
- Adjust for compactness of soil by moving the plotted point in the clay direction an additional 15% for soils having a bulk-density greater than 1.7 gm/cc.



ATTERBERG LIMITS ASTM D-4318

PROJECT	Elizabeth Road	JOB NO.	7010.31	SHEET	
CLIENT	Strombeck Properties	SAMPLE ID	23-058EK	1 of 2	
LOCATION	McKinleyville, TP-1@2.5'	TEST BY	SLC	DATE	8/4/23
SOIL TYPE	Clay Loam	CHECKED BY		CHECK DATE	

ASTM D4318 ATTERBERG LIMITS

LIQUID LIMIT = *N/A
PLASTIC LIMIT = N/A
PLASTIC INDEX = NON PLASTIC

COMMENTS: Unable to cut groove without tearing or keep from sliding in cup.

* PER ASTM D4318 SECTION 11.4, LIQUID LIMIT COULD NOT BE DETERMINED.
SAMPLE CLASSIFIED AS NON PLASTIC.



ATTERBERG LIMITS ASTM D-4318

PROJECT	Elizabeth Road	JOB NO.	7010.31	SHEET	
CLIENT	Strombeck Properties	SAMPLE ID	23-058EK	2 of 2	
LOCATION	McKinleyville, TP-2@2.5'	TEST BY	SLC	DATE	8/4/23
SOIL TYPE	Clay Loam	CHECKED BY		CHECK DATE	

ASTM D4318 ATTERBERG LIMITS

LIQUID LIMIT = *N/A
PLASTIC LIMIT = N/A
PLASTIC INDEX = NON PLASTIC

COMMENTS: Unable to cut groove without tearing or keep from sliding in cup.

* PER ASTM D4318 SECTION 11.4, LIQUID LIMIT COULD NOT BE DETERMINED.
SAMPLE CLASSIFIED AS NON PLASTIC.

APPENDIX 3

Soil Logs

Project Name: *Strombeck / Davis* Field Location Name: *TB #7 Front*
 Project No.: _____ Drilling Method: *MW ER*
 Date: *7/27/23 9:00am* Auger / Rod Diameter: *2' Bucket*
 Driller: *ACS* Location: *Elizabeth*
 Logged By: _____ Elevation: _____
 Depth to Water: *N/A* *Uniform Clay loam*
No mottles NO Gravels, No G.W.

Depth	Color	SILT AND CLAY				SAND & GRAVEL			ASTM D-2488 Group Symbol	MOISTURE			% Organics	SAMPLE			NOTES
		% Clay	% Silt	Plasticity N=None L=Low M=Med. H=High	Consistency S=Soft F=Firm ST=Stiff H=Hard	% Sand F=Fine M=Med. C=Coarse	% Gravel F=Fine M=Med. C=Coarse	Density L=Loose M=Med. D=Dense		D=Dry M=Moist W=Wet S=Saturated	A=Auger SS=Split-Spoon CC=Continuous Core PT=Push Tube						
0.5	Brn Red.	50	50	N L S M H ST H	(F)	FMC	FMC	LMD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL	D M		A SS	Clay / organics No Gravel				
2.5	Lgt Brn	60	40	N L S M H ST H	(F)	FMC	FMC	LMD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL	D M		A SS	Clay loam				
4	Tan	80		N L S M H ST H	(F)	FMC	FMC	LMD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL	D M		A SS	Clay fixation				
5	Brn Red			N L S M H ST H	(F)	FMC	FMC	LMD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL	D M		A SS	Sandy clayey				
7	Red Brn			N L S M H ST H	(F)	FMC	FMC	LMD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL	D M		A SS	Moist clay				
10'	Red Brn			N L S M H ST H	(F)	FMC	FMC	LMD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL	D M		A SS	Bottom of Pit, No G.W. No mottles				
10'				N L S M H ST H	(F)	FMC	FMC	LMD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL	D M		A SS	Half No SW				
				N L S M H ST H	F	FMC	FMC	LMD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL	D M		A SS					
				N L S M H ST H	F	FMC	FMC	LMD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL	D M		A SS					
				N L S M H ST H	F	FMC	FMC	LMD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL	D M		A SS					

Project Name: *Sprinkler/Davis* Field Location Name: *TP # 2*
 Project No.: Drilling Method: *Mini EX*
 Date: *7/27/23* Auger/Rod Diameter: *2' Bucket*
 Driller: Location: *Elizabeth Drive*
 Logged By: *ACS* Elevation:
 Depth to Water: *N/A*

*Uniform Clay Loam
NO CGL NO Mottles
NO Ceramics*

Depth	Color	SILT AND CLAY				SAND & GRAVEL				ASTM D-2488 Group Symbol	MOISTURE			SAMPLE			NOTES
		% Clay	% Silt	Plasticity N=None, L=Low, M=Med, H=High	Consistency S=Soft, F=Firm, ST=Stiff, H=Hard	% Sand F=Fine, M=Med, C=Coarse	% Gravel F=Fine, M=Med, C=Coarse	Density L=Loose, M=Med, D=Dense	D=Dry, M=Moist, W=Wet, S=Saturated		% Organics	A=Auger, SS=Split-Spoon, CC=Continuous Core, PT=Push Tube					
0.5'	<i>Brn Red</i>	<i>50</i>	<i>50</i>	<i>N L S</i>	<i>F</i>	<i>FMC</i>	<i>FMC</i>	<i>LMD</i>	<i>GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL</i>	<i>D M</i>	<i>50</i>	<i>A SS</i>	<i>CC PT</i>	<i>Roots/organics clay</i>			
3'	<i>Light Brn</i>			<i>N L S</i>	<i>F</i>	<i>FMC</i>	<i>FMC</i>	<i>LMD</i>	<i>GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL</i>	<i>D M</i>	<i>20</i>	<i>A SS</i>	<i>CC PT</i>	<i>Uniform red/Brn clay</i>			
4'	<i>tan Red</i>	<i>80</i>		<i>N L S</i>	<i>F</i>	<i>FMC</i>	<i>FMC</i>	<i>LMD</i>	<i>GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL</i>	<i>D M</i>	<i>20%</i>	<i>A SS</i>	<i>CC PT</i>	<i>lighter Brn clay/roots</i>			
6'	<i>Brn Red</i>			<i>N L S</i>	<i>F</i>	<i>FMC</i>	<i>FMC</i>	<i>LMD</i>	<i>GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL</i>	<i>D M</i>	<i>Ø</i>	<i>A SS</i>	<i>CC PT</i>	<i>Tan clay</i>			
7'	<i>Brn Red</i>			<i>N L S</i>	<i>F</i>	<i>FMC</i>	<i>FMC</i>	<i>LMD</i>	<i>GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL</i>	<i>D M</i>	<i>Ø</i>	<i>A SS</i>	<i>CC PT</i>	<i>Good moist</i>			
10'	<i>Brn Red</i>			<i>N L S</i>	<i>F</i>	<i>FMC</i>	<i>FMC</i>	<i>LMD</i>	<i>GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL</i>	<i>D M</i>	<i>Ø</i>	<i>A SS</i>	<i>CC PT</i>	<i>Halt NO CGL NO Mottles</i>			
				<i>N L S</i>	<i>F</i>	<i>FMC</i>	<i>FMC</i>	<i>LMD</i>	<i>GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL</i>	<i>D M</i>		<i>A SS</i>	<i>CC PT</i>				
				<i>N L S</i>	<i>F</i>	<i>FMC</i>	<i>FMC</i>	<i>LMD</i>	<i>GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL</i>	<i>D M</i>		<i>A SS</i>	<i>CC PT</i>				
				<i>N L S</i>	<i>F</i>	<i>FMC</i>	<i>FMC</i>	<i>LMD</i>	<i>GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL</i>	<i>D M</i>		<i>A SS</i>	<i>CC PT</i>				
				<i>N L S</i>	<i>F</i>	<i>FMC</i>	<i>FMC</i>	<i>LMD</i>	<i>GW GP GM GC SW SP SM SC ML CL OL MH CH OH PL</i>	<i>D M</i>		<i>A SS</i>	<i>CC PT</i>				

APPENDIX 4

Percolation Test Results

Date 8/24/2023
 Project Davis
 Pre-Soak method 4 Refills
 Weather Clear
 Test Hole #1

Percolation Test Results

Reading Number	Time	DURATION (MIN)	READING (IN)	DROP (IN)	RATE (MPI)
	900		0		
1	915	15	1 1/2	1 1/2	10.00
2	930	15	2 1/4	3/4	20.00
3	945	15	2 3/4	1/2	30.00
4	960	15	3 3/8	5/8	24.00
5	975	15	3 7/8	1/2	30.00
6	990	15	4 1/2	5/8	24.00
7	1005	15	5	1/2	30.00
8	1020	15	5 1/2	1/2	30.00
9	1035	15	6	1/2	30.00

Date 8/24/2023
 Project Davis
 Pre-Soak method 4 Refills
 Weather Clear
 Test Hole #2

Percolation Test Results

Reading Number	Time	DURATION (MIN)	READING (IN)	DROP (IN)	RATE (MPI)
	905		0		
1	920	15	2 1/2	2 1/2	6.00
2	935	15	3 1/4	3/4	20.00
3	950	15	4 3/8	1 1/8	13.33
4	965	15	4 3/4	3/8	40.00
5	980	15	5	1/4	60.00
6	995	15	5 1/2	1/2	30.00
7	1010	15	6	1/2	30.00
8	1025	15	6 1/2	1/2	30.00
9	1040	15	7	1/2	30.00

Received 3.21.2024 HCP&B

ADDENDUM 001

Onsite Sewage Disposal System Design
Davis Residence

Date: March 15, 2024
Prepared For: Randy & Shelly Davis
Prepared By: Andy Sundquist, PE
Appendix 1: Site Plan & System Layout



1.0 PURPOSE

The purpose of this addendum is verify percolation rates during the wet weather testing period. Wet weather percolation testing is being performed due to undetermined liquid limits and soil samples being classified as non-plastic as determined by Atterberg Limits ASTM D4318.

Additionally, during the original development of the existing parcel, a reserve disposal field was not identified for the existing 4-bedroom residence on the parcel. This addendum also identifies a reserve disposal field and wet weather percolation testing results.

2.0 SITE EVALUATION

On February 9, 2024 an area southwest of the existing 4-bedroom residence was determined to be suitable area for a reserve disposal field to be developed in the event of a failure of the existing disposal field.

3.0 PERCOLATION TEST DATA

Percolation tests were performed on February 9, 2024, tests were performed at a depth of 24-inches belowground surface. The percolation test data for TP#1 and TP#2 was relatively similar to the dry weather testing on August 24, 2023. Tests results for TP#1 and TP#2 resulted in an average **percolation rate of 30-minutes-per-inch for Test Hole #1 and Test Hole #2**. The preferred location remains Test Hole #2. Percolation test results for TP#1 and TP#2 are displayed below.

Table 1. Test Hole #1 Percolation Test Results

Reading Number	Time	DURATION (MIN)	READING (IN)	DROP (IN)	RATE (MPI)
	10:55		0		
1	11:10	15	3	3	5.00
2	11:25	15	4.25	1.25	12.00
3	11:40	15	4.75	0.5	30.00
4	11:55	15	5	0.25	60.00
5	12:10	15	5.625	0.625	24.00
6	12:25	15	6	0.375	40.00
7	12:40	15	6.5	0.5	30.00
8	12:55	15	7	0.5	30.00
9	13:10	15	7.375	0.375	40.00

Table 2. Test Hole #2 Percolation Test Results

Reading Number	Time	DURATION (MIN)	READING (IN)	DROP (IN)	RATE (MPI)
	10:50		0		
1	11:05	15	1.25	1.25	12.00
2	11:20	15	2	0.75	20.00
3	11:35	15	2.5	0.5	30.00
4	11:50	15	3.125	0.625	24.00
5	12:05	15	3.5	0.375	40.00
6	12:20	15	4	0.5	30.00
7	12:35	15	4.625	0.625	24.00
8	12:50	15	5	0.375	40.00
9	13:05	15	5.5	0.5	30.00

Percolation testing was also performed for the existing 4-bedroom residence on the parcel to identify a suitable reserve disposal field location in the event of a failure of the existing disposal field. The percolation test resulted in a **percolation rate of 30-minutes-per-inch for this location**. Percolation test results can be found in Table 3 below.

Table 3. Test Hole #3 Percolation Test Results

Reading Number	Time	DURATION (MIN)	READING (IN)	DROP (IN)	RATE (MPI)
	13:15		0		
1	13:30	15	1.5	1.5	10.00
2	13:45	15	2.5	1	15.00
3	14:00	15	3.25	0.75	20.00
4	14:15	15	3.75	0.5	30.00
5	14:30	15	4.5	0.75	20.00
6	14:45	15	5.25	0.75	20.00
7	15:00	15	5.5	0.25	60.00
8	15:15	15	6.25	0.75	20.00
9	15:30	15	6.75	0.5	30.00

4.0 RESERVE FIELD DESIGN CALCULATIONS

Utilizing Humboldt County Health and Human Services Department of Public Health's *Onsite Wastewater Treatment System Regulations and Technical Manual*, and an estimated flow rate of 150-gallons per day per bedroom up to three bedrooms, and 75-gallons per day for each additional bedroom, the proposed septic system will be sized for an **average daily flow of 525-gallons for the existing 4-bedroom residence.**

Table 4. Minimum Required Septic Tank Volume

Required Tank Volume	Intended Use
750 gallons	1-bedroom Cabin/Mobil Home
1200 gallons	2-Bedroom Residence
1500 gallons	3-4-Bedroom Residence
Three Times Daily Flow	Other Applications (E.g. Commercial, multi-family, etc.)

Using Table 2. *Soil Application Rates* in the Humboldt County Onsite Wastewater Treatment System Regulations and Technical Manual and a **30-minutes-per-inch percolation rate**, absorption area and trench lengths can be calculated as shown below.

Table 5. Minimum Required Absorption Area and Trench Length for Primary and Reserve Disposal Field

Hum. Co. OWTS Table 2 Application Rate (gpd/ft ²)	Estimated Daily Flow Rate (gal)	Minimum Absorption Area (ft ²)	Minimum Absorption Trench Length ¹ (ft)
0.363	525	1,446	241

1. Assumes 6-ft² of infiltrative trench surface per linear foot of trench

5.0 RESERVE DISPOSAL FIELD AND SYSTEM LAYOUT

Table 6. Setback Requirements

Minimum Horizontal Distance (ft)	Public Water Well	Private Water Well	Surface Intake Public Water	Perennial Stream, Wetland & Other Waters	Ephemeral Stream or Drainage Swale
Septic Tank	100	100		50	25
Pump Tank	100	100		50	25
Dispersal System	150	100	200-400	100	50

Minimum Horizontal Distance (ft)	Property Lines Public Water	Property Lines Private Water	Buildings of Structures	Cut Banks Unstable Land Steep Slopes >30%	Large Tress
Septic Tank	5	25	5	25	10
Pump Tank	5	25	5	25	10
Dispersal System	10	50	10	25	10

For the reserve disposal field for the existing residence will require an area that is 30-feet wide by 61-feet long (1,830 ft²). A distribution box shall connect the supply line to the absorption trenches. The absorption field will consist of four (4) total absorption trenches, three (3) at 60-feet in length and one (1) at 61-feet in length for a total of 241-feet of absorption trenches. All trenches shall be spaced horizontally at ten (10) feet on center and contain 4-inch drainpipe with perforated inverts. Trenches shall be sixty (60) inches deep and eighteen (18) inches wide. The drainpipe invert shall be installed at a depth of twenty-four (24) inches below existing grade to allow for sufficient gravity fall from the septic tank to the distribution box. The required grade should be verified in the field by the contractor installing the system. The trenches are to be backfilled with 24-inches of native top-soil, mounded a minimum of 6-inches to allow for settlement and additional pipe cover. See Table 7 below for the reserve field system summary.

Table 7. Primary Residence System Summary

Septic Tank				
Minimum 1,500-gallon dual-chambered, constructed of polyurethane or concrete				

Disposal Field				
Trench Type	Number of Trenches	Trench Length (FT)	Trench Depth (IN)	Trench Width (IN)
Traditional Gravel Filled Trench	3	60	60	18
Traditional Gravel Filled Trench	1	61	60	18

APPENDIX 1

Site Plan and System Layout

NEW HOUSES

**AOB 2,184 SF LIVING SPACE
& 780 SF GARAGE,
ADU 490 SF LIVING SPACE
2427 ELIZABETH ROAD
McKINLEYVILLE, CA 95519
APN: 511-491-021**



VICINITY MAP
NOT TO SCALE

NOTES:

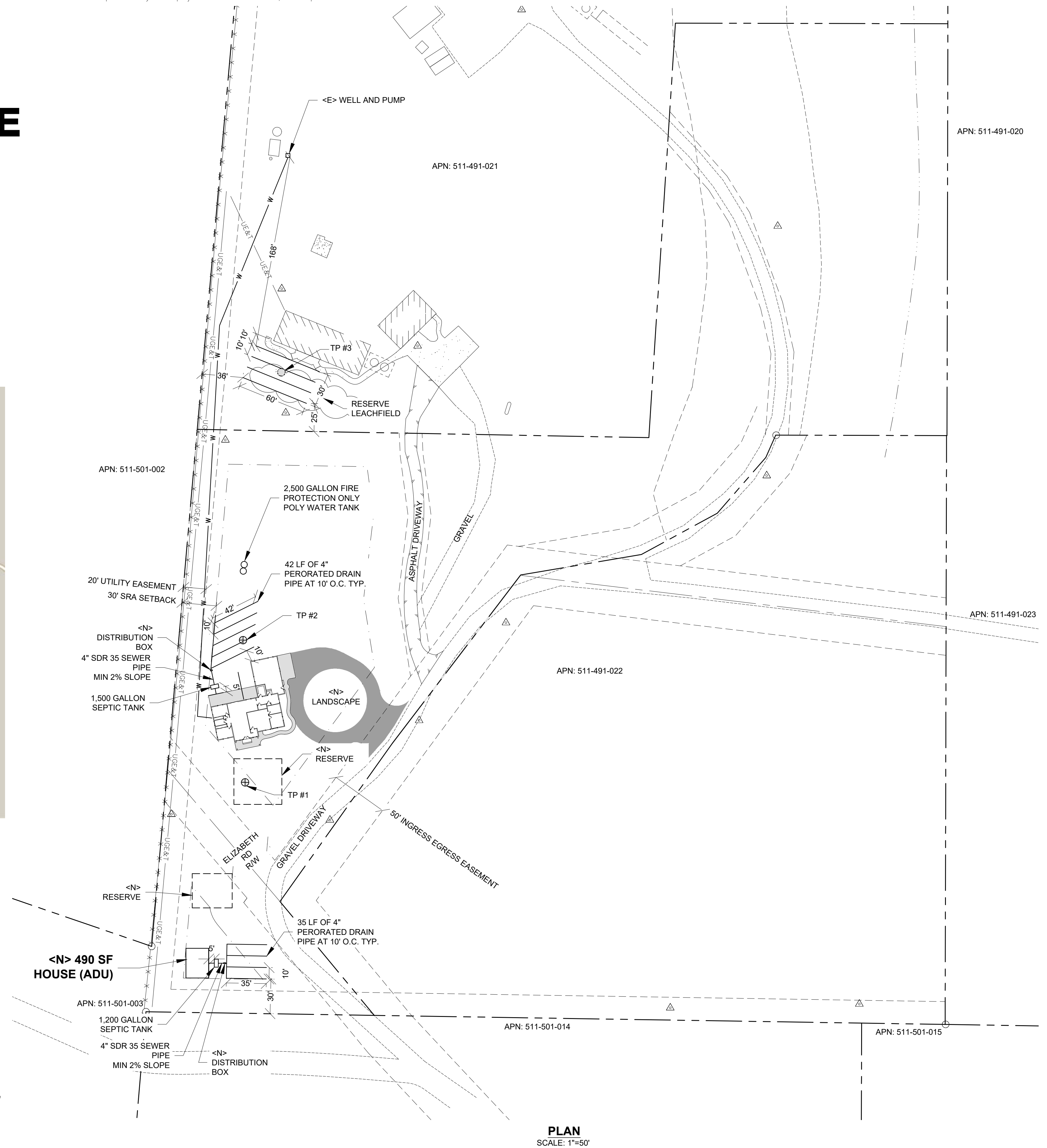
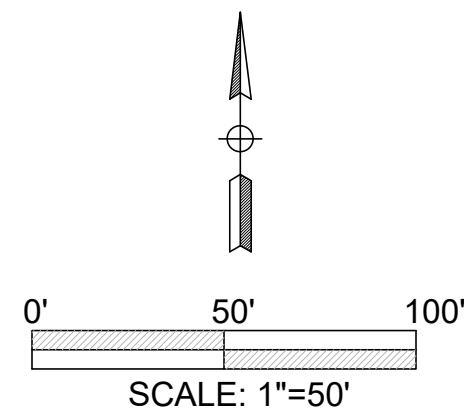
1. ALL LOCATIONS ARE APPROXIMATE. NO SURVEY WAS CONDUCTED FOR THIS PROJECT.
2. PROPERTY LINES ARE FROM POINTS WEST SURVEYING CO. TENTATIVE MAP DATED APRIL 2022.
3. CONTOURS SHOWN HEREON ARE APPROXIMATE.
4. IMAGE SHOWN HEREON IS FROM BING.
5. 25 ALDER TREES UNDER 12" AND 5 FIR TREES 18" - 24" WILL BE REMOVED FOR THIS PROJECT.

OWNER INFORMATION:

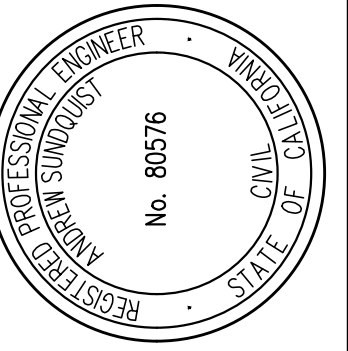
OWNER: RANDY & SHELLI DAVIS
PHONE: 707-407-8701

SITE INFORMATION:

5 ACRES
SRA: YES



PLAN
SCALE: 1"=50'



**CANDOR ROCK
INC.**

(707) 496-5360 andy@candorrock.com

NO.	HISTORY / REVISION	BY	CHK.	DATE

**AOB - NEW HOUSE
2427 ELIZABETH ROAD MCKINLEYVILLE, CA 95519
SEPTIC SYSTEM LAYOUT**

APN: 511-491-021

DRAWN	ACS
CHECK	ACS
APPROVED	ACS
DATE	9/14/2023
JOB NUMBER	7.13.2023

SHEET
C1.0