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Wastewater Feasibility Study

Justin Vineyards/Knollwood Vineyards Use Permit #P19-00124-UP
Planning Commission Hearing Date (September 4, 2024)

WASTEWATER FEASIBILITY REPORT

For

Knollwood Vineyards
4101 Big Ranch Road
Napa, CA 94558

APN 036-190-026

Prepared for:

J. Kevin Corley
4242 Big Ranch Road
Napa, CA 94558

Project# 4117060.0

March 19, 2019
Revised: July 17, 2024

1515 Fourth Street, Napa, CA 94559 www.rsacivil.com 707.252.3301.v 707.252.4966.f

TABLE OF CONTENTS

ATTACHMENTS

I. INTRODUCTION

Knollwood Vineyards is seeking a use permit modification to acknowledge existing production of 33,000 gallons of wine per year, increase production to 40,000 gallons per year, increase employees, and permit visitors and marketing events. The winery property is a 31.7 ± acre parcel located at 4101 Big Ranch Road, Napa, California (APN 036-190-026). See Attachment 1 for a vicinity map and USGS sitemap, and see Attachment 2 for a reduced Use Permit plan set.

This report will evaluate the disposal of domestic and winery process wastewater to support the proposed use permit modification.

II. EXISTING PROCESS AND DOMESTIC WASTEWATER DISPOSAL SYSTEMS

There are two existing leach fields, one serving the existing domestic wastewater system, and the other serving process wastewater. The existing leach line serving the domestic wastewater system will be abandoned per Napa County standards.

The existing process wastewater system was permitted in 1987 for a capacity of 500 gpd. A new separate treatment system is proposed to handle the process wastewater, so the existing system will be re-purposed to dispose of domestic wastewater. A licensed septic contractor shall inspect the process wastewater leach field, and repair as necessary, prior to re-use for domestic wastewater.

III. WINERY DOMESTIC WASTEWATER CHARACTERISTICS

Knollwood Vineyards intends to increase the number of employees and visitors such that the domestic wastewater produced does not exceed the 500 GPD capacity of the existing field. The unit values for proposed employees and visitors are shown. The number of visitors and employees is based on information provided by the owner. The projected flow is based on Napa County Environmental Management guidelines. The following is a summary of the estimated flows from the proposed winery expansion:

Table 1. Domestic Wastewater overview

Use	Source	Number	Projected Flow (gpd)	Total Flow No Event Day (gpd)	Total Flow Event Day (gpd)
WINERY	Full-time employees	8	15	120	120
	Part-time employees	2	15	30	30
	Harvest employees	5	15	75	75
	Visitors	14	3	42	0*
	Marketing Event w/ meals (catered)	26*	10	0	260*
	Event Staff	1	15	0	15
Grand Total			**Total Peak Flow**	**267**	**500**

* There will be no visitors on days with marketing events. Portable toilets will be required for all events with greater than 26 people.

IV. WINERY PROCESS WASTEWATER CHARACTERISTICS

The following is a summary of the winery wastewater characteristics:

Wine Production:
40,000 gallons of wine per year
2.38 gallons of wine per case
16,807 cases/year

Wastewater Production:
5 gallons of wastewater/gallon of wine
200,000 gallons/year

Peak Daily Waste Water Flow:
Crush Period = 45 days
Annual wine production x 1.5 / 45
1,333 gallons/day

Average Daily Flow:
200,000/365 = 548 gallons/day

Monthly Wastewater Flows:

	% By Month	Waste/Month	
Sep	14%	28,000	Gal/Month
Oct	14%	28,000	Gal/Month
Nov	11%	22,000	Gal/Month
Dec	8%	16,000	Gal/Month
Jan	4%	8,000	Gal/Month
Feb	6%	12,000	Gal/Month
Mar	6%	12,000	Gal/Month
Apr	5%	10,000	Gal/Month
May	6%	12,000	Gal/Month
Jun	7%	14,000	Gal/Month
Jul	9%	18,000	Gal/Month
Aug	10%	20,000	Gal/Month
Totals	100%	200,000	Gal/Year

V. WINERY PROCESS WASTEWATER SUBSURFACE DRIP IRRIGATION

According to Napa County Environmental Management Sewage Treatment System Design Guidelines, winery process wastewater must be treated prior to surface discharge. Based on our experience, winery wastewater characteristics are as follows:

Characteristics	Units	Average
pH		3.5
BOD5	mg/l	6,000
TSS	mg/l	500
Nitrogen	mg/l	20
Phosphorus	mg/l	10

The treatment goal for surface drip irrigation is 160 mg/L BOD and 80 mg/L TSS. To meet this goal, a Vitalis Worm Farm treatment train is proposed. This treatment train may be modified for more desirable treatment process prior to submitting construction plans. A Biofiltro worm farm and a LYVE MBBR System are included as alternatives to the Vitalis treatment system. The following sections describe this process in more detail.

The existing 750-gallon sump tank will be re-used to convey winery process wastewater to the proposed treatment system.

V.A. OPTION 1: VITALIS WORM FARM SYSTEM

Septic Tank with bacteria and pH adjustment

A new 2,000-gallon septic tank will serve as a pump tank with primary solid retention. This septic tank will include a bacteria dosing pump and a pH dosing pump. The bacteria dosing pump will introduce beneficial bacteria that work in conjunction with the worms to break down the wastewater solids. The pH dosing pump regulates the pH level of the effluent so that it remains within the acceptable pH range for the worm treatment system.

Worm Bed Treatment & Sump Tanks

From the septic tank, the wastewater is pumped into four 10'-9" diameter 6' tall worm bed treatment tanks. The wastewater filters through the worm bed tanks where the worms help to reduce the TSS. From there, wastewater flows into a second 2,000-gallon septic tank equipped with a bacteria dosing pump. This tank is connected to another set of four 10'-9" diameter 6' tall worm bed treatment tanks. Wastewater filters through the second set of worm bed tanks and flows into a third 2,000-gallon septic tank connected to a third set of four 10'-9" diameter 6' tall worm bed treatment tanks. Wastewater filters through the third set of worm bed tanks and flows into a 500-gallon sump tank, where water is pumped into irrigation water storage tanks. See Attachment 4 for a reduced set of Use Permit plans showing this layout and Attachment 3 for a system layout from Vitalis.

Holding Tank and Dispersal Field

To provide a preliminary estimate of the amount of storage tanks required, we have prepared a monthly water balance, as shown in attachment 6. Monthly wastewater production is based on a percentage of the total annual wastewater production. The amount of water allowed to be applied is estimated by the typical vine water demand. The irrigation will be applied to areas of vineyards

outside well setback requirements. The area available for irrigation is shown in Attachment 6. An area of 10.8 acres of vineyard has been used to calculate the storage capacity required. Based on the monthly analysis, no storage is required. Storage capacity of 20,000 gallons is provided for treated process wastewater generated during wet weather periods.

During the summer months, all of the treated wastewater will be used for irrigation. During the wet winter months, a limited discharge will be consistent with landscape water demand, and no discharge will occur within 48-hours of a forecasted rain event and also for 48-hours after a rain event. These irrigation scheduling constraints necessitate installing tanks to store excess water that cannot be discharged during the winter months. All stored water will then be used for irrigation during the summer months.

V.B. OPTION 2: BIOFILTRO WORM FARM SYSTEM

Septic Tank with pH adjustment

A new 2,000-gallon septic tank will serve as a pump tank with primary solid retention. This septic tank will include a pH dosing pump.

IBC Totes with flow, pH, and ORP monitoring.

From the septic tank, wastewater is pumped into two Intermediate Bulk Containers (IBCs) that will measure flow, Oxygen Reduction Protentional (ORP), and pH.

BIDA first and second pass systems

From the IBC totes, the wastewater is then pumped into BIDA first pass. The BIDA system is housed in two modified shipping containers with two floors. Each floor contains wood shavings, aerobic microbes, worms, and drainage basins. The microbes and worms work in conjunction to aerate the wastewater and reduce the solids.

Wastewater flows from the BIDA first pass into an underground 300 gallon holding tank where it is then pumped into a BIDA second pass, similar to the BIDA First Pass. Wastewater then flows into a second 300 gallon holding tank where it is pumped into irrigation water storage tanks. See Attachment 5 for a system layout from Biofiltro.

V.C. OPTION 3: LYVE SYSTEM

Septic Tank with screening

A new 2,000-gallon septic tank will serve as the screening tank. It will be equipped with duplex filter canister screens, with one screen operating in duty and the second screen operating in stand-by. Wastewater will be pumped from the septic tank, through the canister screens, and into the Equalization tank.

Packaged Plant Treatment Unit

From the sump tank, wastewater is pumped to the packaged plant treatment unit, which has five components to treat wastewater: Equalization Tank, Moving Bed Biofilm Reactor (MBBR), the Activated Sludge Aeration Basin (ASAB), the Membrane Bio Reactor (MBR), and Sludge Digesters.

The equalization tank will be continually mixed and provide aeration, pH monitoring and adjustment, nutrient level monitoring and adjustment, and prevent surges or uneven flow patterns. The pH and nutrient levels are adjusted by a separate dosing pumps and tanks and are monitored by the Lyve control center.

The wastewater flows from the Equalization Tank into the MBBR where the wastewater will be aerated, monitored for Dissolved Oxygen (DO) levels, and the BOD reduced through the use of bacterial cultures.

From there, wastewater flows into the ASAB, where the wastewater is aerated, the remaining balance of the BOD is removed, and the take up of the TSS occurs. From there, wastewater flows into the MBR for solids separation. The effluent is pulled through the membrane to physically separate suspended solids and send clean effluent to the irrigation water storage tanks. Accumulating solids will either be returned to the ASAB or sent to one of two sludge digesters.

The two sludge digesters work alternatingly so as to allow one digester to settle and separate the clear water from the sludge. The clear water is returned to the EQ tank for reprocessing, while the thickened sludge is pumped and hauled off by a third-party septic hauler. See Attachment 6 for the Lyve System Layout Description.

VI. CONCLUSION

Sufficient capacity is available in the existing process wastewater sub-surface drip field to re-use the field for domestic wastewater. It has also been demonstrated that it is feasible to treat the winery process wastewater and distribute this to the vineyard using drip irrigation. The above methodology results in a design that meets the Napa County Environmental Health Division Design standards for the treatment of winery wastewater.

ATTACHMENT 1

Vicinity Map, USGS Site Map

KNOLLWOOD VINEYARDS
VICINITY MAP

NAPA COUNTY CALIFORNIA

VICINITY MAP

SCALE: 1" = 3000'

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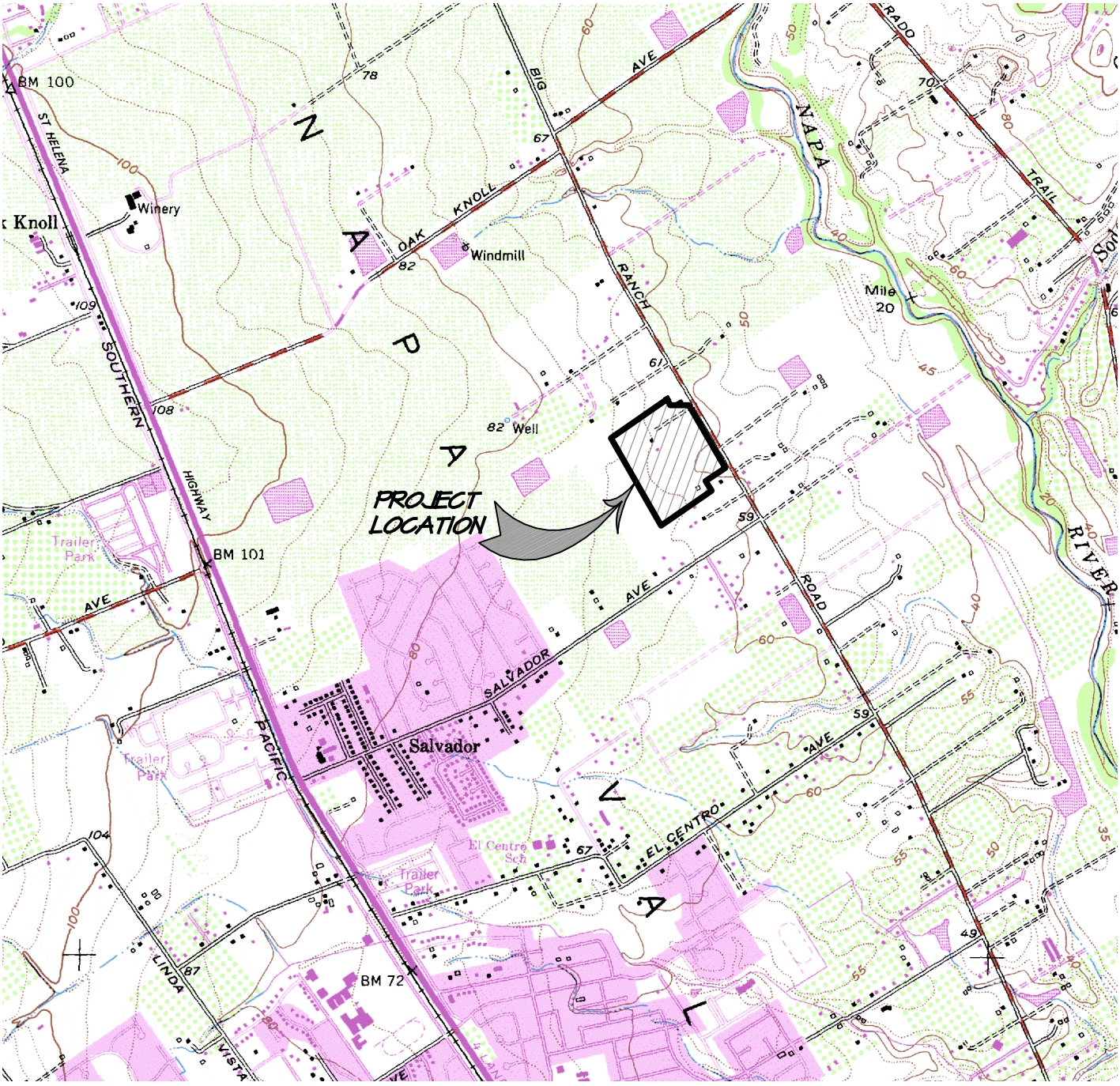
KNOLLWOOD VINEYARDS
USGS MAP

NAPA COUNTY CALIFORNIA



GRAPHIC SCALE

2000 0 2000 4000

(IN FEET)
1 inch = 2000 FT

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MARCH 8, 2019 4117060.0 EXH-USGS.DWG

ATTACHMENT 2

Reduced Use Permit Plan Set

KNOLLWOOD VINEYARDS
USE PERMIT MODIFICATIONS

SYMBOL LEGEND

EXISTING

- LIGHT
- HOSE BIB
- GAS RISER
- GAS VALVE
- EV — ELECTRIC VAULT
- TREE — TREE (AS NOTED)
- SSCO — SEWER CLEANOUT
- SURVEY CONTROL STATION
- IRRIGATION CONTROL VALVE
- FLOWLINE
- EDGE OF GRAVEL
- SURVEY — LIMITS OF RSA+ TOPO
- COUNTY — LIMITS OF COUNTY CONTOURS

PROPOSED

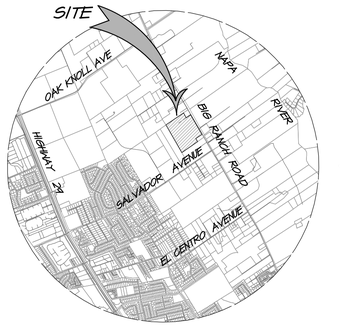
- SD — STORM DRAIN LINE
- DW — DOMESTIC WATER LINE
- FW — FIRE WATER LINE
- SEWER LINE
- SLOPE AS SHOWN
- WDH — WET DRAFT HYDRANT
- WV — WATER VALVE
- DI — DRAIN INLET
- AD — AREA DRAIN
- TREE — EX TREE TO BE REMOVED
- SWALE FLOW LINE
- PROPERTY LINE

ABBREVIATIONS

AC	ASPHALT CONCRETE
BFG	BOTTOM FINISH GRADE
C	COMPACT STALL
℄	CENTERLINE
CONF	CONFORM
CY	CUBIC YARD
DI	DRAIN INLET
DW	DOMESTIC WATER
EG	EXISTING GRADE
EP	EDGE OF PAVEMENT
ESCP	EROSION & SEDIMENT CONTROL PLAN
EX / (E)	EXISTING
(F)	FUTURE
FF	FINISH FLOOR
FG	FINISH GRADE
FH	FIRE HYDRANT
℉	FLOW LINE
FW	FIRE WATER
GAL	GALLON
GB	GRADE BREAK
HP	HIGH POINT
INV	INVERT
LF	LINEAL FEET/FOOT
LP	LOW POINT
MH	MANHOLE
OC	ON CENTER
ONTS	ONSITE WATER TREATMENT SYSTEM
ℙ	PROPERTY LINE
(P)	PROPOSED
R	RADIUS
S	SLOPE (FEET/FOOT)
S.A.D.	SEE ARCHITECTS DRAWINGS
S/B	SETBACK
SD	STORM DRAIN
SDCO	STORM DRAIN CLEANOUT
SF	SQUARE FEET
S.M.D.	SEE MECHANICAL DRAWINGS
SSMH	SANITARY SEWER MANHOLE
STA	STATION
TFG	TOP FINISH GRADE
TW	TOP OF WALL
TYP	TYPICAL
WV	WATER VALVE
WW	WASTE WATER

CALL 811 BEFORE YOU DIG — 811 — SAFE DIGGING PARTNER

SITE PLAN
SCALE: 1" = 100'



VICINITY MAP
SCALE: 1" = 3000'

PROJECT INFORMATION

APPLICANT:	KNOLLWOOD VINEYARDS 4101 BIG RANCH ROAD NAPA, CA 94558
SITE ADDRESS:	4101 BIG RANCH ROAD NAPA, CA 94558
CIVIL ENGINEER:	RSA+ 1515 FOURTH STREET NAPA, CA 94559 (707) 252-3301
APN:	036-190-026
PARCEL AREA:	31.70 ACRES
EXISTING USE:	VINEYARD & WINERY
PROPOSED USE:	VINEYARD & WINERY
ZONING:	AP

TOPOGRAPHIC SURVEY

FIELD SURVEY PERFORMED BY RSA+ APRIL, 2018.

CONTOURS ARE SHOWN EVERY ONE FOOT (1'), HIGHLIGHTED EVERY FIVE FEET (5').

BOUNDARY NOTE

THIS BOUNDARY SHOWN ON THIS MAP IS RECORD INFORMATION PER GRANT DEED DOCUMENT NO. 2017-0008132, NAPA COUNTY RECORDS.

DATUM

VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (NAD83) 2011 EPOCH BASED UPON G.P.S. OBSERVATIONS ON NETWORK UTILIZING CONTINUALLY OPERATING REFERENCE STATION (C.O.R.S.) INFORMATION FROM THE CALIFORNIA SPATIAL REFERENCE CENTER (C.S.R.C.)

SHEET INDEX

GRAPHIC SCALE
100 0 100 200
(IN FEET)
1 inch = 100 FT

LOCAL SITE CONTROL

#	GROUND NORTHING	GROUND EASTING	ELEVATION
1	1890255.65	6413218.26	67.39'
2	1890027.17	6412801.74	70.86'
3	1890542.26	6413112.64	63.68'
4	1890112.42	6413375.13	66.02'

ASSOCIATED PERMITS

PERMIT #	PHASE
00401104	SEPTIC/PROCESS WASTE WATER
00400744	WINERY
B11-00715	CRUSH PAD CANOPY

NO.	DATE	REVISIONS	BY	APP'D
0	03/09/2018	INITIAL SUBMITTAL	LMM	PSW
1	06/07/2019	FIRST PLAN CHECK	LMM	PSW
2	01/10/2020	SECOND PLAN CHECK	LMM	PSW
3	07/27/2022	FOURTH PLAN CHECK	LMM	PSW
4	06/30/2023	FIFTH PLAN CHECK	LMM	PSW
5	01/02/2024	SIXTH PLAN CHECK	LMM	PSW

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KNOLLWOOD VINEYARDS
COVER SHEET
NAPA COUNTY
CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — PAUL SARGENT WARNER — No. 82758 Exp. 9-30-24 — CIVIL ENGINEER — STATE OF CALIFORNIA

DATE	JAN. 2, 2024
DRAWN	LMM
DESIGNED	RRS
CHECKED	NAW
JOB NO.	4117060.0

SHEET NO.
UP1
1 OF 9 SHEETS

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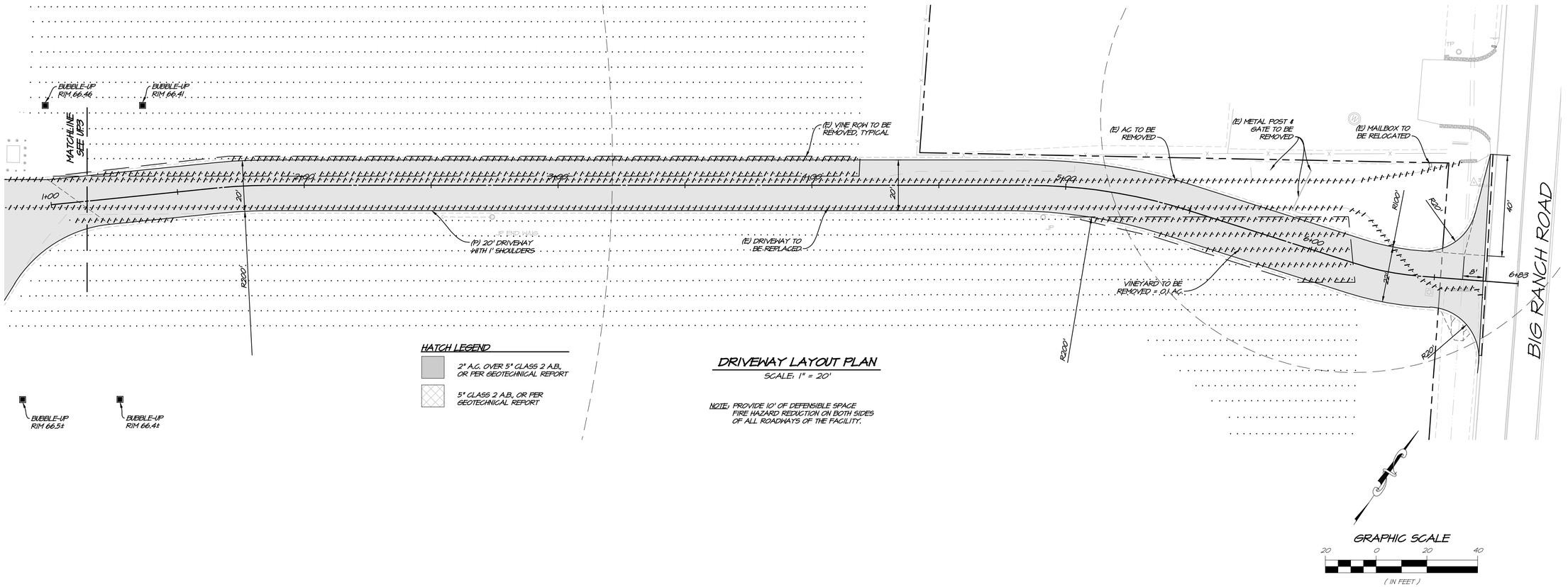


HATCH LEGEND

- 2" A.C. OVER 5" CLASS 2 A.B., OR PER GEOTECHNICAL REPORT
- 5" CLASS 2 A.B., OR PER GEOTECHNICAL REPORT

DRIVEWAY LAYOUT PLAN

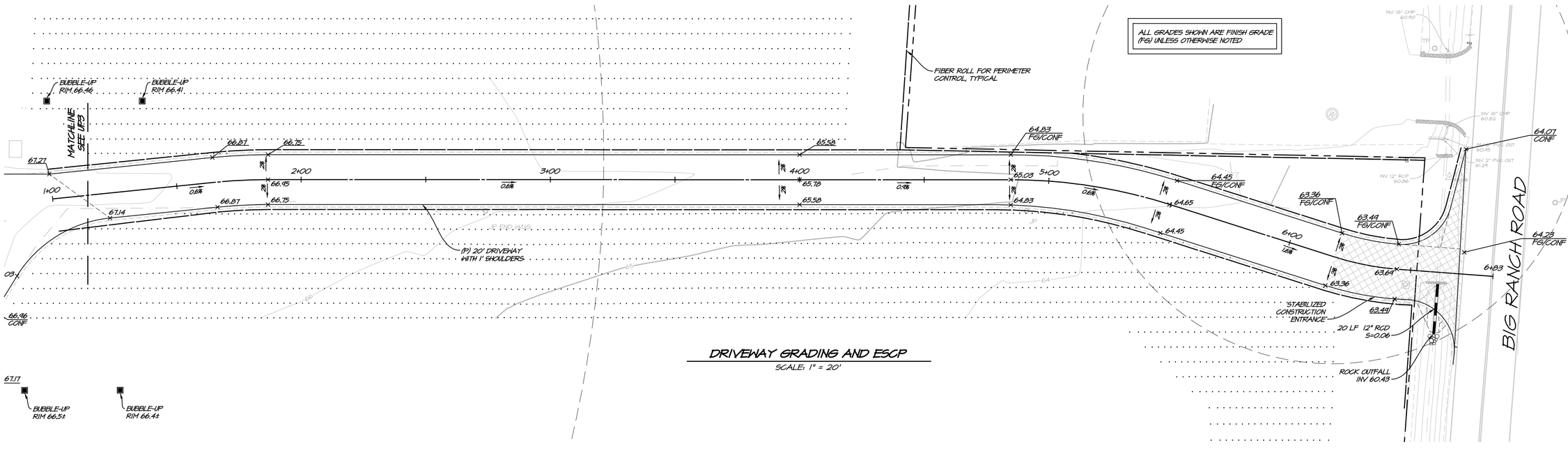
SCALE: 1" = 20'

NOTE: PROVIDE 10' OF DEFENSIBLE SPACE FIRE HAZARD REDUCTION ON BOTH SIDES OF ALL ROADWAYS OF THE FACILITY.

GRAPHIC SCALE

20 0 20 40

(IN FEET)
1 inch = 20 FT



DRIVEWAY GRADING AND ESCP

SCALE: 1" = 20'

NO.	DATE	REVISIONS	BY	APPD
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1	06/07/2019	FIRST PLAN CHECK	LMM	PSW
2	01/10/2020	SECOND PLAN CHECK	LMM	PSW
3	07/27/2022	FOURTH PLAN CHECK	LMM	PSW
4	06/02/2023	FIFTH PLAN CHECK	LMM	PSW
5	01/02/2024	SIXTH PLAN CHECK	LMM	PSW

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KNOLLWOOD VINEYARDS
DRIVEWAY LAYOUT, GRADING, AND ESCP
NAPA COUNTY CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
PAUL SARGENT WARDEN
No. 82758
Exp. 9-30-24
CIVIL ENGINEER
STATE OF CALIFORNIA

DATE	JAN. 2, 2024	
DRAWN	LMM	
DESIGNED	RRS	
CHECKED	NAW	
JOB NO.	4117060.0	

SHEET NO.
UP2
2 OF 9 SHEETS

PRELIMINARY-NOT FOR CONSTRUCTION

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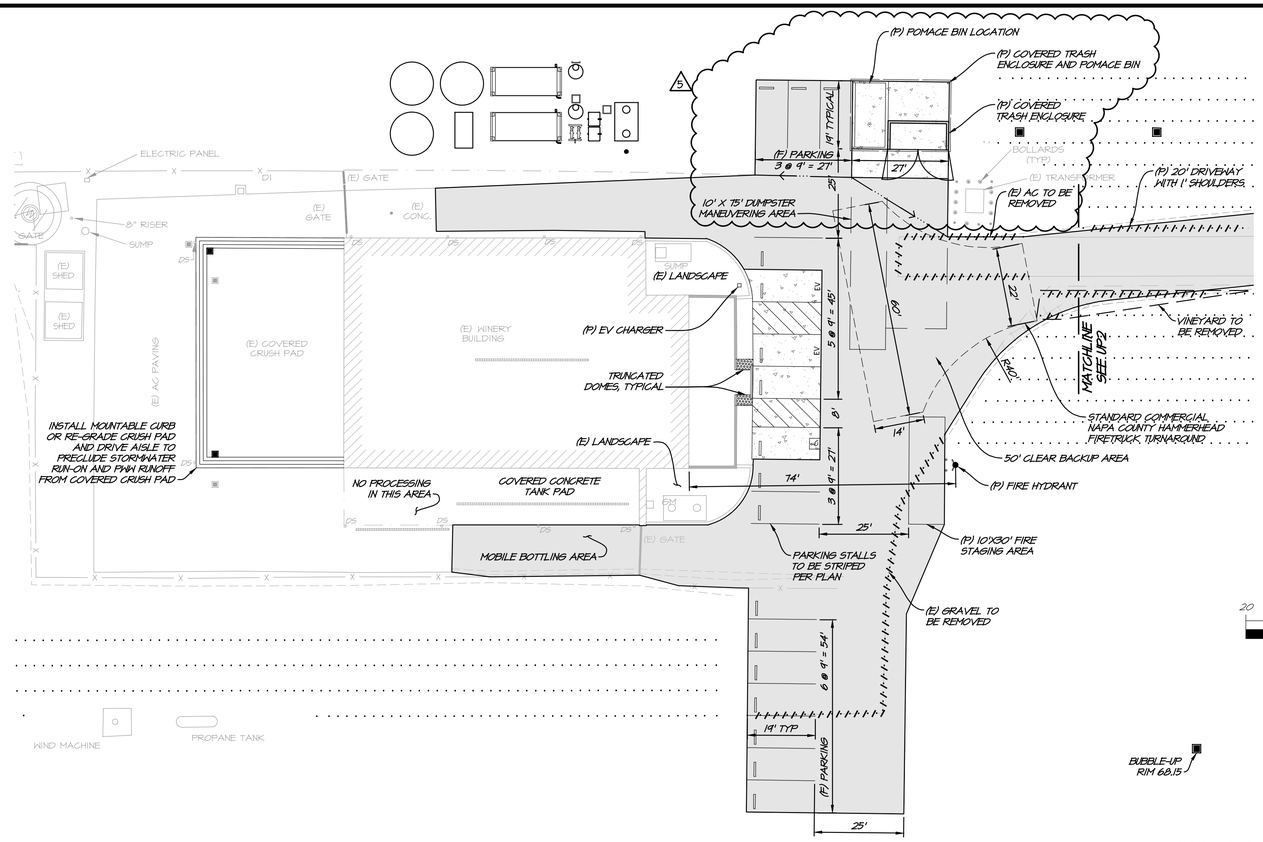
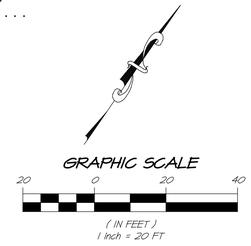


WINERY LAYOUT PLAN

SCALE: 1" = 20'

NOTE: PROVIDE 100' OF DEFENSIBLE SPACE AROUND ALL STRUCTURES.

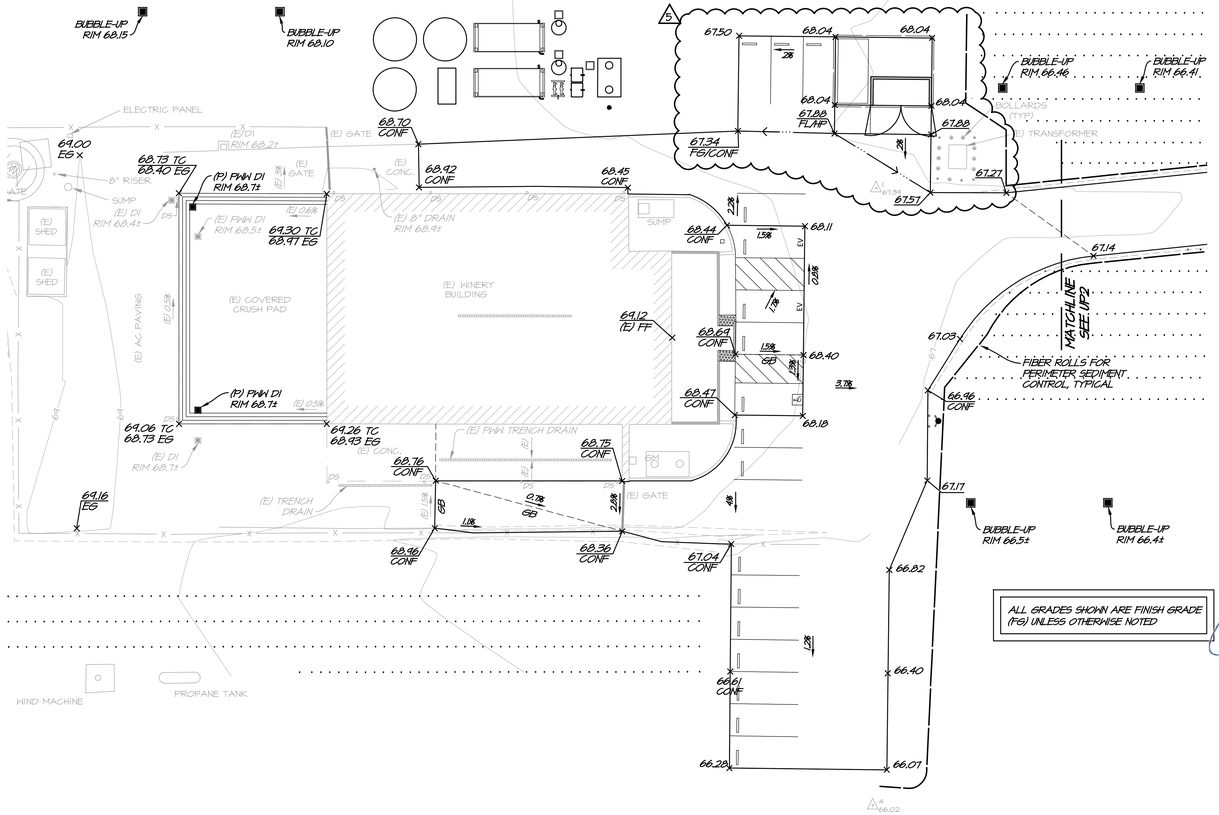


HATCH LEGEND

6" 3,000 PSI CONCRETE WITH #4 REBAR AT 24" O.C. OVER 4" A.B., OR PER STRUCTURAL ENGINEER

2" A.C. OVER 5" CLASS 2 A.B., OR PER GEOTECHNICAL ENGINEER

PARKING SUMMARY	
EXISTING	16
PROPOSED	18
STANDARD STALLS	17
ADA STALLS	1



ALL GRADES SHOWN ARE FINISH GRADE (FG) UNLESS OTHERWISE NOTED

WINERY GRADING AND ESCP

SCALE: 1" = 20'

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1	06/07/2019	FIRST PLAN CHECK	LMM	PSH
2	01/10/2020	SECOND PLAN CHECK	LMM	PSH
3	07/27/2022	FOURTH PLAN CHECK	LMM	PSH
4	06/02/2023	FIFTH PLAN CHECK	LMM	PSH
5	01/02/2024	SIXTH PLAN CHECK	LMM	PSH

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KNOLLWOOD VINEYARDS
WINERY LAYOUT, GRADING, AND ESCP

NAPA COUNTY CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER PAUL SARGENT WARNER No. 82758 Exp. 9-30-24 CIVIL ENGINEER STATE OF CALIFORNIA

DATE	JAN. 2, 2024
DRAWN	LMM
DESIGNED	RRS
CHECKED	NAW
JOB NO.	4117060.0

SHEET NO.
UP3
3 OF 9 SHEETS

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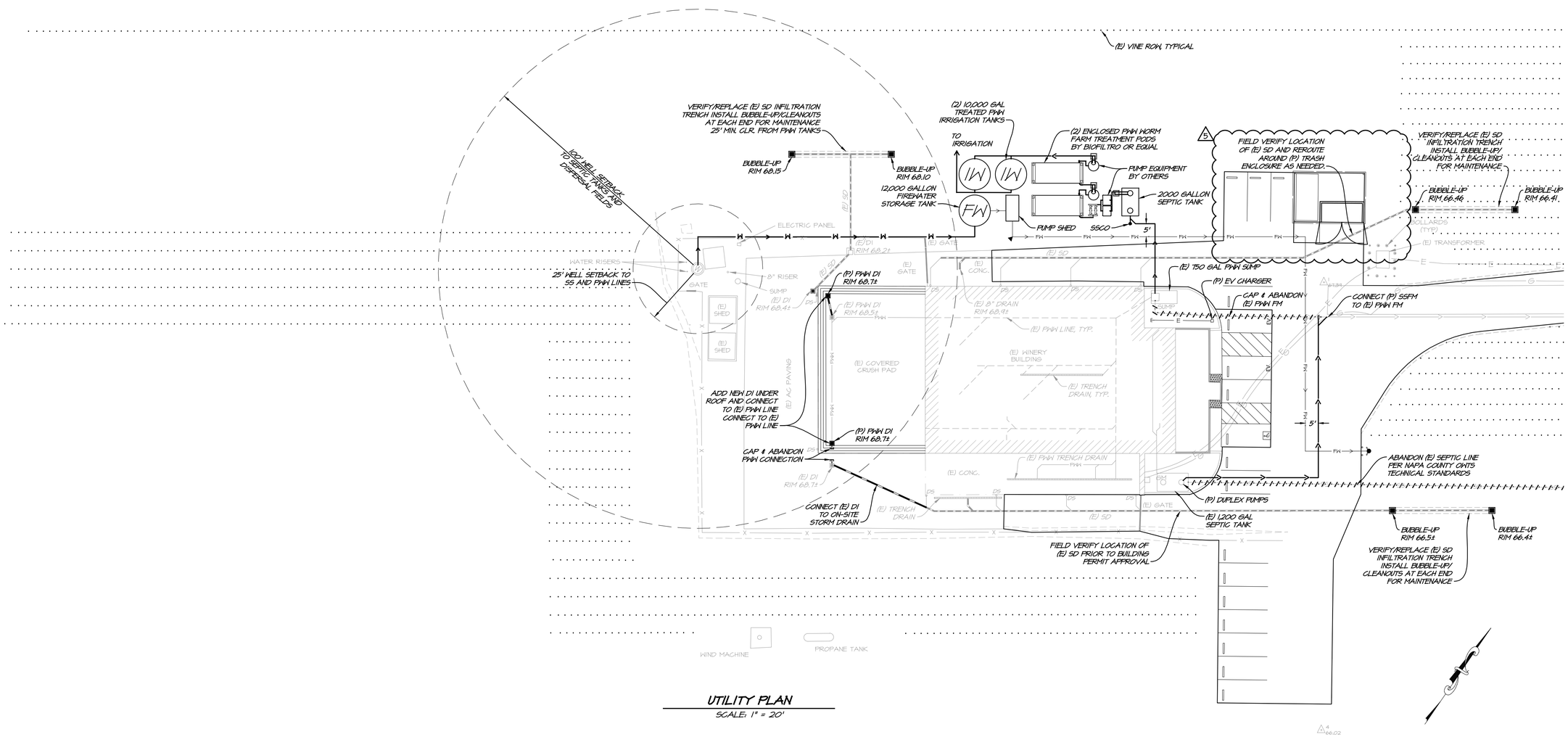

UTILITY PLAN
SCALE: 1" = 20'

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2	01/10/2020	SECOND PLAN CHECK	LMM	PSW
3	07/27/2022	FOURTH PLAN CHECK	LMM	PSW
4	06/02/2023	FIFTH PLAN CHECK	LMM	PSW
5	01/02/2024	SIXTH PLAN CHECK	LMM	PSW

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KNOLLWOOD VINEYARDS
UTILITY PLAN
NAPA COUNTY
CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER PAUL SARGENT WARNER No. 82758 Exp. 9-30-24 CIVIL ENGINEER STATE OF CALIFORNIA

DATE	JAN. 2, 2024
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DESIGNED	RRS
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JOB NO.	4117060.0

SHEET NO.
UP4
4 OF 9 SHEETS

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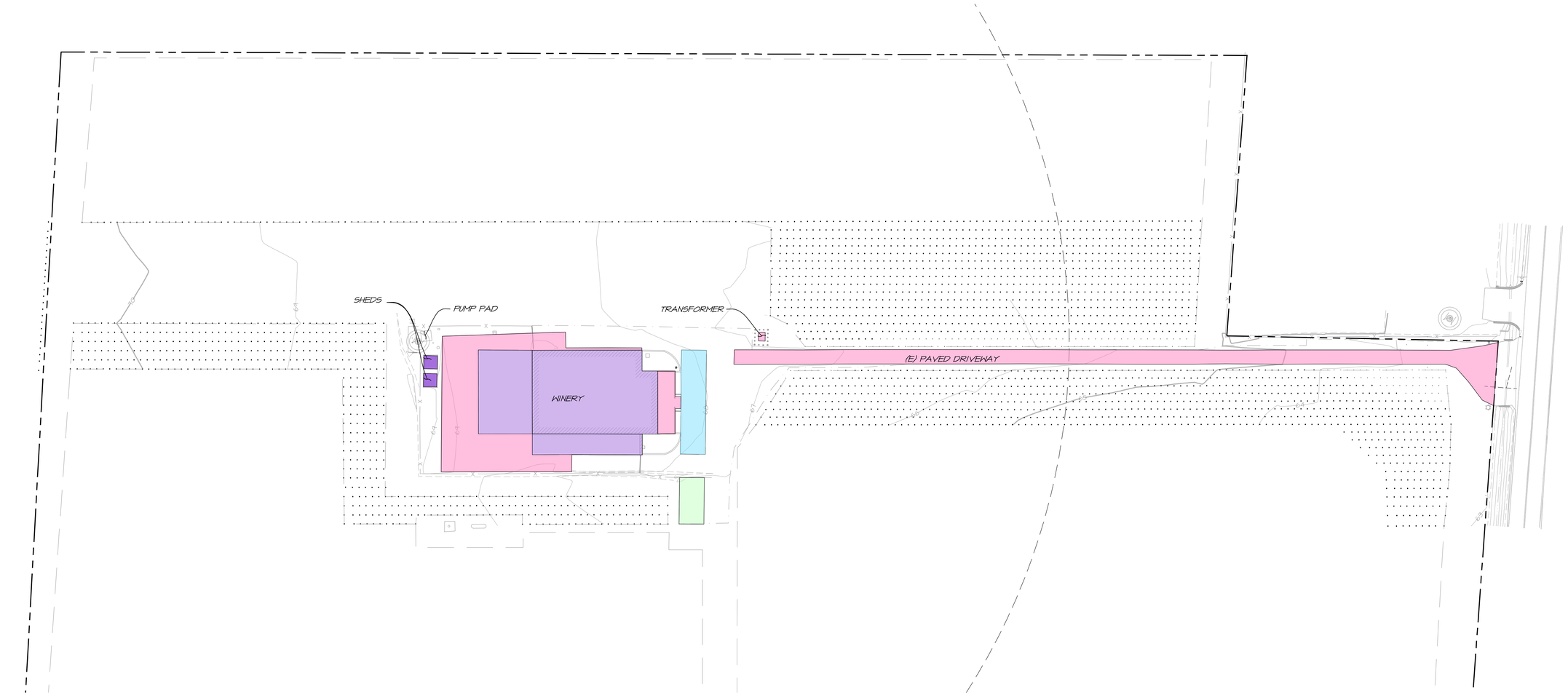

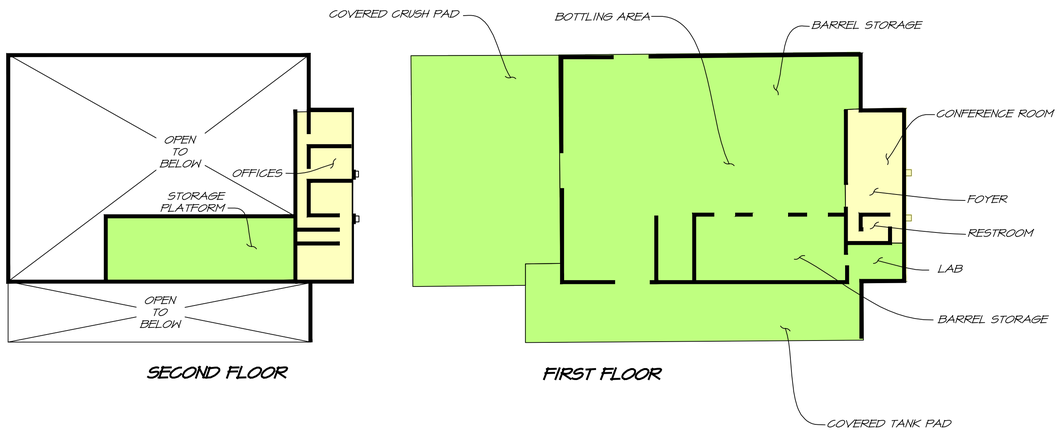

INTERIOR, PRODUCTION & ACCESSORY AREAS

SCALE: 1" = 20'

LEGEND

- EMPLOYEE PARKING = 684 SF
- VISITOR PARKING = 1,539 SF
- STRUCTURES = 10,226 SF
- PAVED AREA & ABOVE GROUND TANKS = 13,325 SF
- ACCESSORY AREAS = 1,382 SF
- PRODUCTION AREAS = 10,526 SF

AREA CALCULATIONS

+ = WINERY DEVELOPMENT AREA = 10,910 SF

+ + + + = WINERY COVERAGE AREA = 25,774 SF

COVERAGE AREA AS PERCENT OF PARCEL = 1.9%

ACCESSORY AREA AS PERCENT OF PRODUCTION = 13.1%

GRAPHIC SCALE

40 0 40 80

(IN FEET)
1 inch = 40 FT

NO.	DATE	REVISIONS	BY	APPD
0	03/04/2014	INITIAL SUBMITTAL	LMM	PSM
1	06/07/2014	FIRST PLAN CHECK	LMM	PSM
2	01/01/2020	SECOND PLAN CHECK	LMM	PSM
3	01/27/2022	FOURTH PLAN CHECK	LMM	PSM
4	08/03/2023	FIFTH PLAN CHECK	LMM	PSM
5	01/02/2024	SIXTH PLAN CHECK	LMM	PSM

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KNOLLWOOD VINEYARDS
EXISTING COVERAGE & DEVELOPMENT

NAPA COUNTY CALIFORNIA

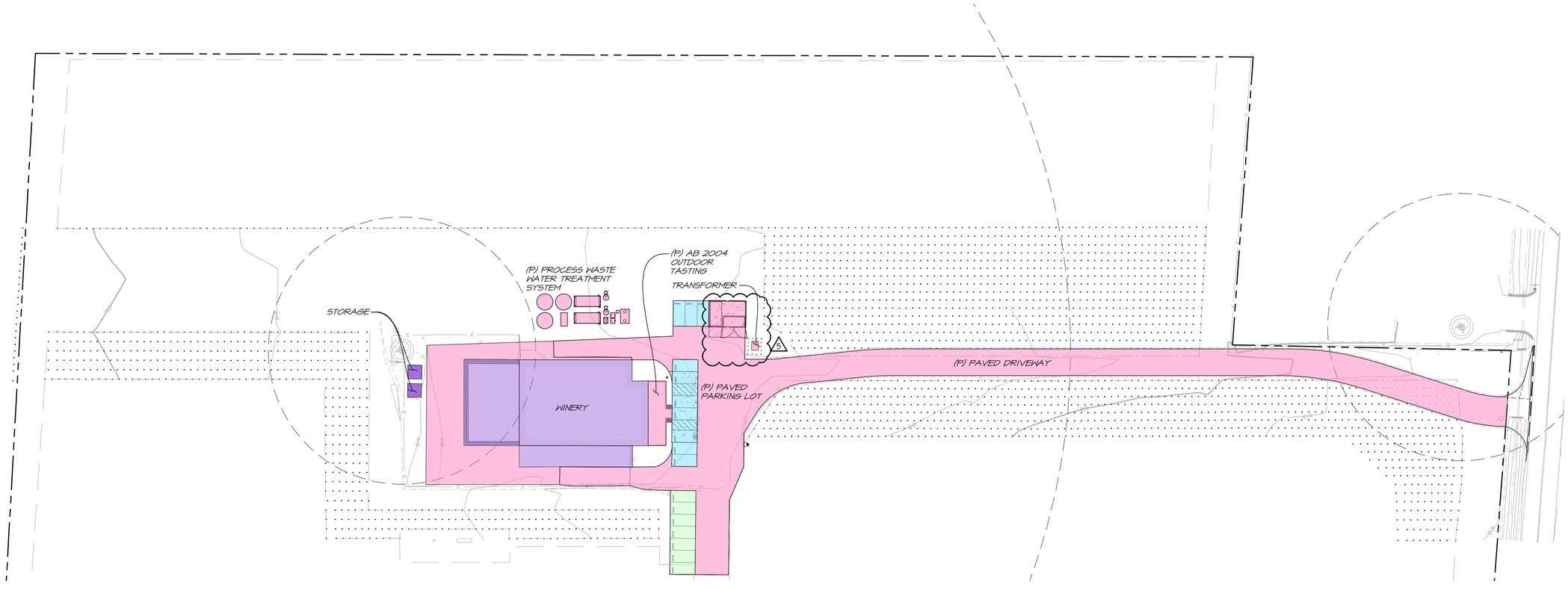
REGISTERED PROFESSIONAL ENGINEER
PAUL SARGENT WARNICK
No. 82718
Exp. 9/30-24
CIVIL ENGINEER
STATE OF CALIFORNIA

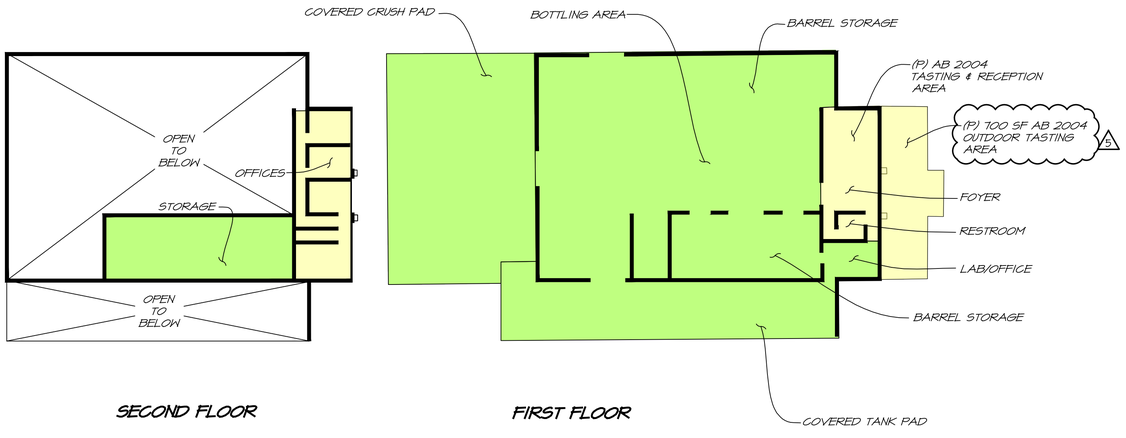
DATE	JAN. 2, 2024
DRAWN	LMM
DESIGNED	RRS
CHECKED	NAH
JOB NO.	4117060.0

SHEET NO.
UP5
5 OF 9 SHEETS

R:\2017\4117060.0_Knollwood_Vineyards_Use_Permit_Modification\DWG\PLPS-5-COV-DEV-Existing.dwg 01/03/2024 12:04:52PM lmigram

PRELIMINARY-NOT FOR CONSTRUCTION





INTERIOR, PRODUCTION & ACCESSORY AREAS

SCALE: 1" = 20'

LEGEND

- EMPLOYEE PARKING = 1,193 SF
- VISITOR PARKING = 2,035 SF (5)
- STRUCTURES = 10,226 SF
- PAVED AREA & ABOVE GROUND TANKS = 29,046 SF (5)
- ACCESSORY AREAS = 2,086 SF
- PRODUCTION AREAS = 10,526 SF

AREA CALCULATIONS

+ = WINERY DEVELOPMENT AREA = 11,165 SF

+ + + + = WINERY COVERAGE AREA = 43,325 SF

COVERAGE AREA AS PERCENT OF PARCEL = 3.1%

ACCESSORY AREA AS PERCENT OF PRODUCTION = 19.8%

GRAPHIC SCALE

40 0 40 80

(IN FEET)
1 inch = 40 FT

NO.	DATE	REVISIONS	BY	APPD
0	03/04/2014	INITIAL SUBMITTAL	LMM	PSH
1	06/07/2014	FIRST PLAN CHECK	LMM	PSH
2	01/09/2020	SECOND PLAN CHECK	LMM	PSH
3	07/27/2022	FOURTH PLAN CHECK	LMM	PSH
4	08/22/2023	FIFTH PLAN CHECK	LMM	PSH
5	08/02/2024	SIXTH PLAN CHECK	LMM	PSH

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KNOLLWOOD VINEYARDS
PROPOSED COVERAGE & DEVELOPMENT

NAPA COUNTY CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
PAUL SARGENT WARNICK
No. 82759
Exp. 9-30-24
CIVIL ENGINEER
STATE OF CALIFORNIA

DATE	JAN. 2, 2024
DRAWN	LMM
DESIGNED	RRS
CHECKED	NAW
JOB NO.	411060.0

SHEET NO.
UP6
6 OF 9 SHEETS

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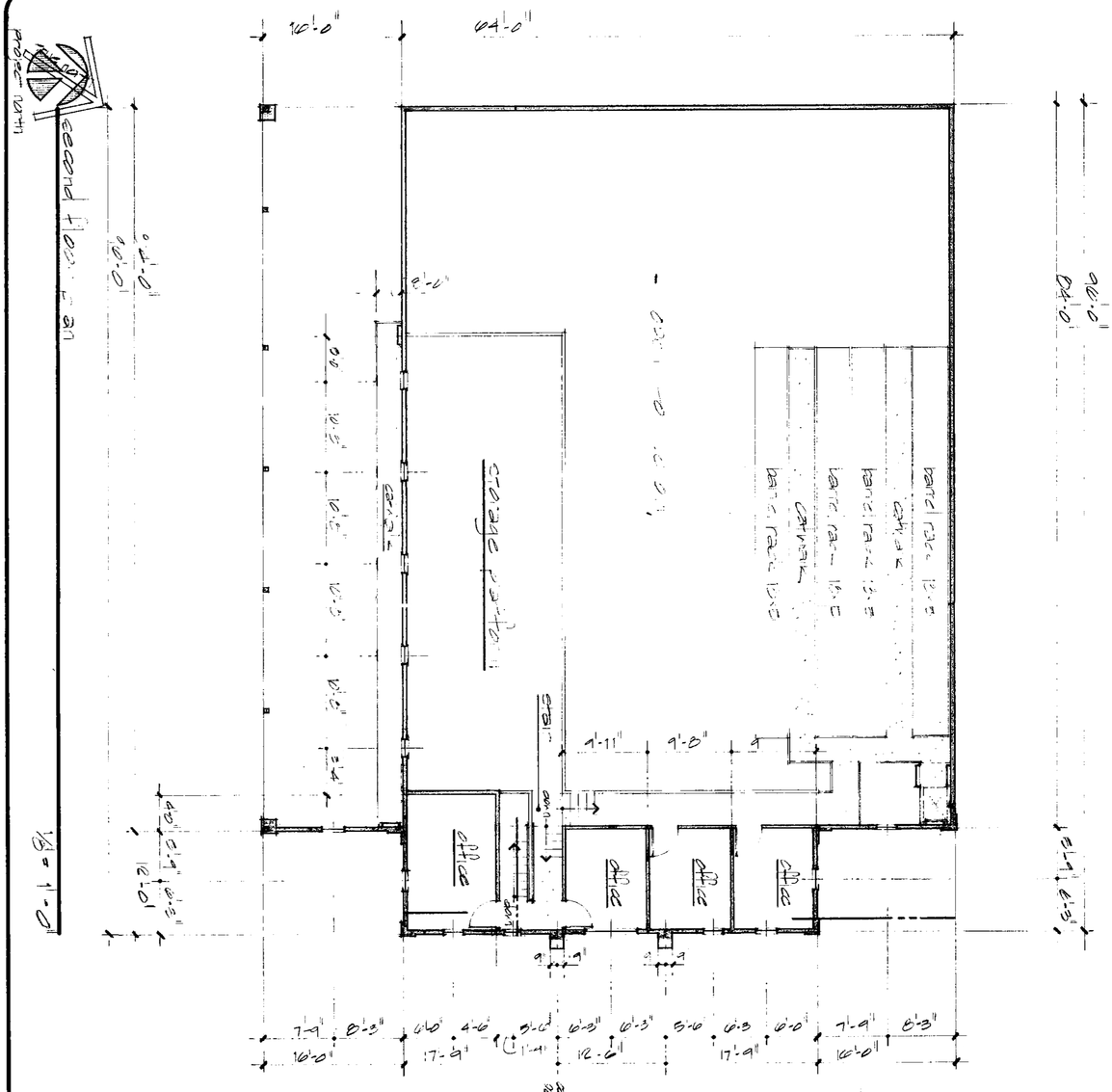
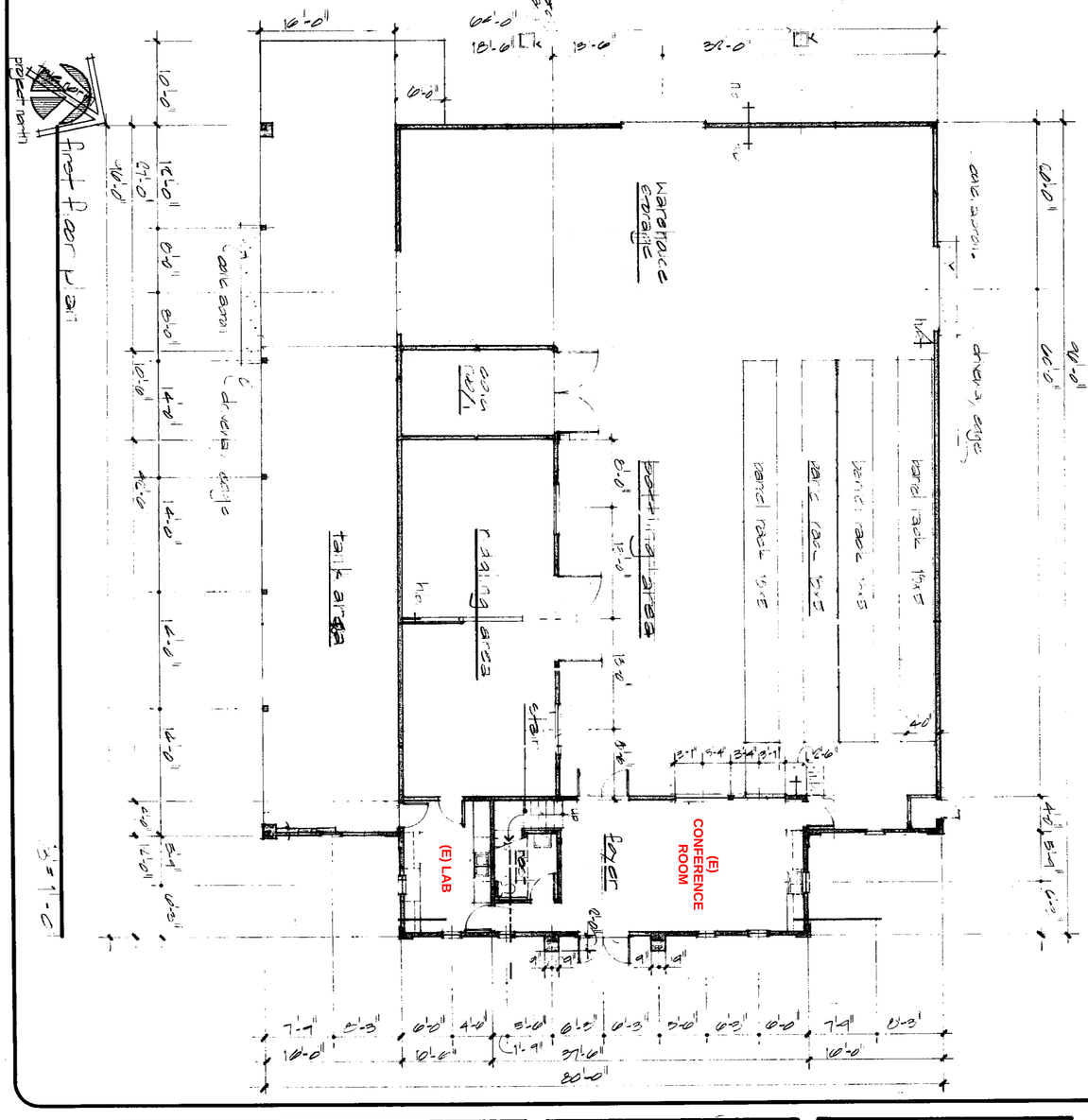




A1

Knollwood Vineyards

Big Ranch Road, Napa, Ca.

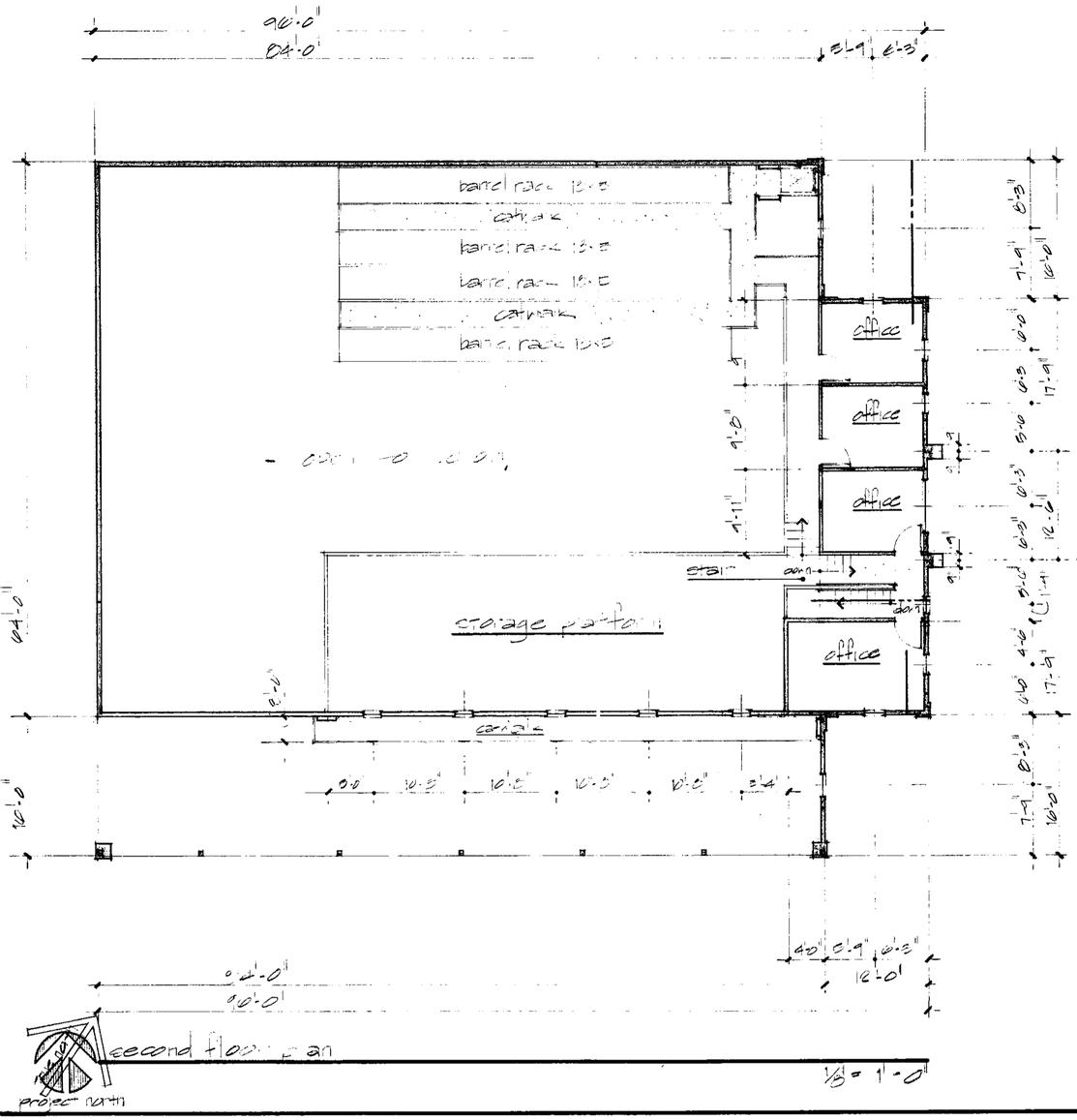
- first floor plan
- second floor plan

EXISTING FLOOR PLANS

date: 3.5.07
scale: as noted
job no.: 0756
drawn by: km

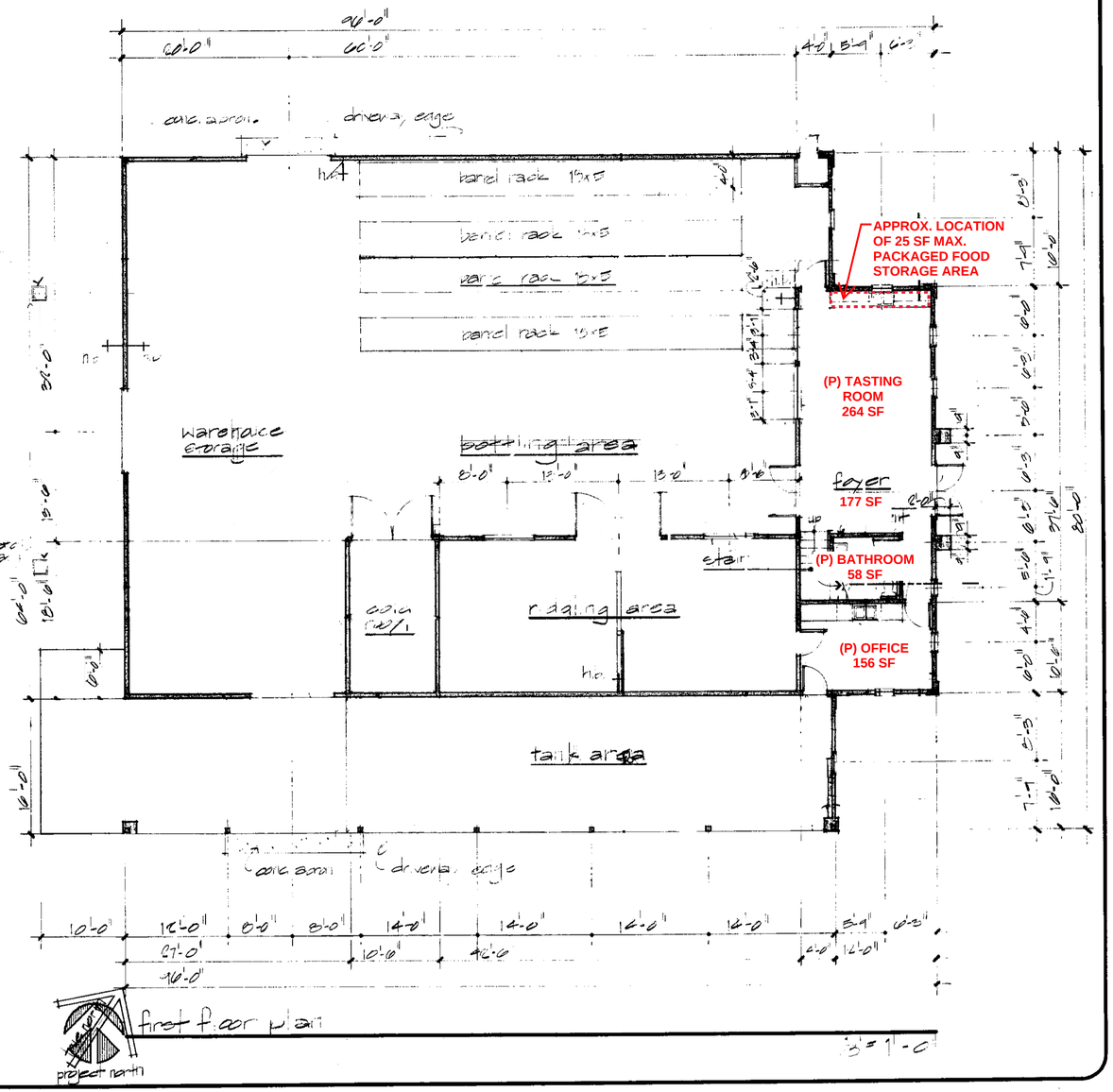
KM design team
1040 main st.
suite no. 305
napa, ca. 94559
707 257 3602

NOTE:
ALL BUILDINGS SHALL COMPLY WITH CALIFORNIA FIRE CODE, CHAPTER 10, MEANS OF EGRESS REQUIREMENTS INCLUDING BUT NOT LIMITED TO; EXIT SIGNS, EXIT DOORS, EXIT HARDWARE AND ILLUMINATION.



second floor plan

1/8" = 1'-0"



first floor plan

1/8" = 1'-0"

KM design team
1040 main st.
suite no. 305
napa, ca. 94559
707 257 3602

date: 3.6.17
scale: as noted
job no.: 0750
drawn by: KM

PROPOSED FLOOR PLANS

- first floor plan
- second floor plan

Knollwood Vineyards
Big Ranch Road, Napa, Ca.

A2

SOUTH ELEVATION
SCALE: 1/8" = 1'

EAST ELEVATION
SCALE: 1/8" = 1'

NORTH ELEVATION
SCALE: 1/8" = 1'

WEST ELEVATION
SCALE: 1/8" = 1'

NO.	DATE	REVISIONS	BY	APPD
0	03/21/2024	INITIAL SUBMITTAL	LMM	PSH
1	06/07/2024	FIRST PLAN CHECK	LMM	PSH
2	01/02/2020	SECOND PLAN CHECK	LMM	PSH
3	07/27/2022	FOURTH PLAN CHECK	LMM	PSH
4	06/22/2023	FIFTH PLAN CHECK	LMM	PSH
5	01/02/2024	SIXTH PLAN CHECK	LMM	PSH

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RSA+ CONSULTING CIVIL ENGINEERS + SURVEYORS + (1980)

KNOLLWOOD VINEYARDS
EXISTING ELEVATIONS
NAPA COUNTY
CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
PAUL SARGENT KRAMER
No. 82758
Exp. 9-30-24
CIVIL ENGINEER
STATE OF CALIFORNIA

DATE	JAN. 2, 2024	
DRAWN	LMM	
DESIGNED	RRS	
CHECKED	NAH	
JOB NO.	4117060.0	

SHEET NO.
A3
9 OF 9 SHEETS

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PRELIMINARY-NOT FOR CONSTRUCTION

ATTACHMENT 3

Existing Wastewater System

DATE 4-17-87
FEE $60.00
RECEIPT NO. 19521
BY Evergood

NAPA COUNTY
DEPARTMENT OF ENVIRONMENTAL HEALTH
APPLICATION & PERMIT TO CONSTRUCT A SEWAGE SYSTEM

A.P.# 36-190-11
RECORD # 559

OWNER: Knollwood Winery
SITE ADDRESS: 4085 Big Ranch Rd.
MAILING ADDRESS: 4242 Big Ranch

CONTRACTOR: Self.
ADDRESS:

TYPE OF WORK: NEW CONSTRUCTION (X) REPAIR ( ) ADDITION ( ) ALTERATIONS ( )
SPECIAL DESIGN ( ) PRIVATE SEWAGE DISPOSAL SYSTEM (Ponds) ( )

PROPOSED USE: Residential( ) Units ____ /BDRMS ____ Commercial/Industrial (X) 500 G.P.D.
Other( ) Explain

WATER SUPPLY: Public ( ) Individual (X) (Well X, Spring ____, Creek ____ or Lake ____)
Distance from well to any part of nearest sewage disposal system 100'± feet.
Additional nearby wells 100'±. Plot plan of proposed sewage system received yes.

County Road setback 62 feet from center line. Bldg. Dept. Form Received (X)

SPECIFICATIONS: Septic Tank: Type Concrete Size 1500 gal. (gallons)
Drainline: Total Length 667' Trench Depth 36" Rock Under Leach Line 12"
Sewer Line: Type PVC Approximate Length 610' Depth 12"+
Sump Pump: Tank Size 750 gal Alarm Type audible
See Special Design Plans Approved: (date) Designer
See Private Sewage Disposal System Plans Approved: (date) Designer
Other drain lines must be 25'± from the subsurface drain. Subsurface drain must be located - exposed for verification. Will verify with Bill Vyeneilo in field.
Issuing Sanitarian: R. Draper

WORKER'S COMPENSATION COVERAGE: (Check one of the following)
( ) A certificate of current Worker's Comp. Insurance is on file with this office.
(X) A certificate of current Worker's Comp. Insurance is being filed with this application.
(X) I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner without complying with the Worker's Compensation laws California.

TERMS OF PERMIT

Applicant agrees that:
1) Sanitarian will be notified a minimum of 24 hours prior to requiring inspection(s).
2) Sanitarian and engineer's inspection, when indicated, will be obtained prior to covering the system.
3) The permit and a copy of the approved sewage disposal system design shall be available at the parcel site at all times.
4) Any deviation from approved plan and specifications without prior approval of this office will be cause for stopping work until the changes are fully justified and approved.
5) Prior to authorizing occupancy of any building with an engineered designed system a signed statement by the design engineer certifying that the system was installed in compliance with the approved plan must be submitted to the Department of Environmental Health.
6) This permit is subject to revocation if found to be in nonconformance with Napa County Code of Ordinances, Title V, Article 3 (The Sewage Ordinance).

IT IS UNDERSTOOD THAT THE ISSUANCE OF A PERMIT IN NO WAY INDICATES THAT A GUARANTEE OF PERFECT AND INDEFINITE OPERATION OF THIS SYSTEM IS MADE BY THE NAPA COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH AND THAT THE OWNER IS REQUIRED TO MAKE ANY REPAIRS NECESSARY TO CONFINE SEWAGE AS REQUIRED BY THE COUNTY SEWAGE ORDINANCE. I HEARBY ACKNOWLEDGE THAT I HAVE READ THIS APPLICATION AND STATE THAT THE ABOVE IS CORRECT AND AGREE TO COMPLY WITH ALL COUNTY ORDINANCES AND STATE LAWS REGULATING CONSTRUCTION OF SEWAGE DISPOSAL SYSTEMS. THIS PERMIT SHALL EXPIRE BY LIMITATION IF WORK AUTHORIZED IS NOT COMMENCED WITHIN 2 YEARS.

Owner or Authorized Agent By William M. Vyeneilo

EHD-10:11/12/86

INSPECTION RECORD

Sewer Line ABS — 12" — 6/26/87 — MC
Material — Depth — Date — Inspector

Septic Tank Concrete — 1500 + sump pump — 6/26/87 — MC
Type — Size — Date — Inspector

Leach Lines ok — 6/26/87 — MC
Date — Inspector

Soil Compares with Percolation Record ok

Average Surface Slope(s) 1-2%

Trench Width 18" Depth 36" Total Length ____ No. Lines 12

Rock Under Leachline 12" Distance Between Trenches 12"

Top of Leachline to Finish Grade 18" Distance Wells from System 105'

Accessory Facilities (Diversion Drains, Sump Pumps, etc.)

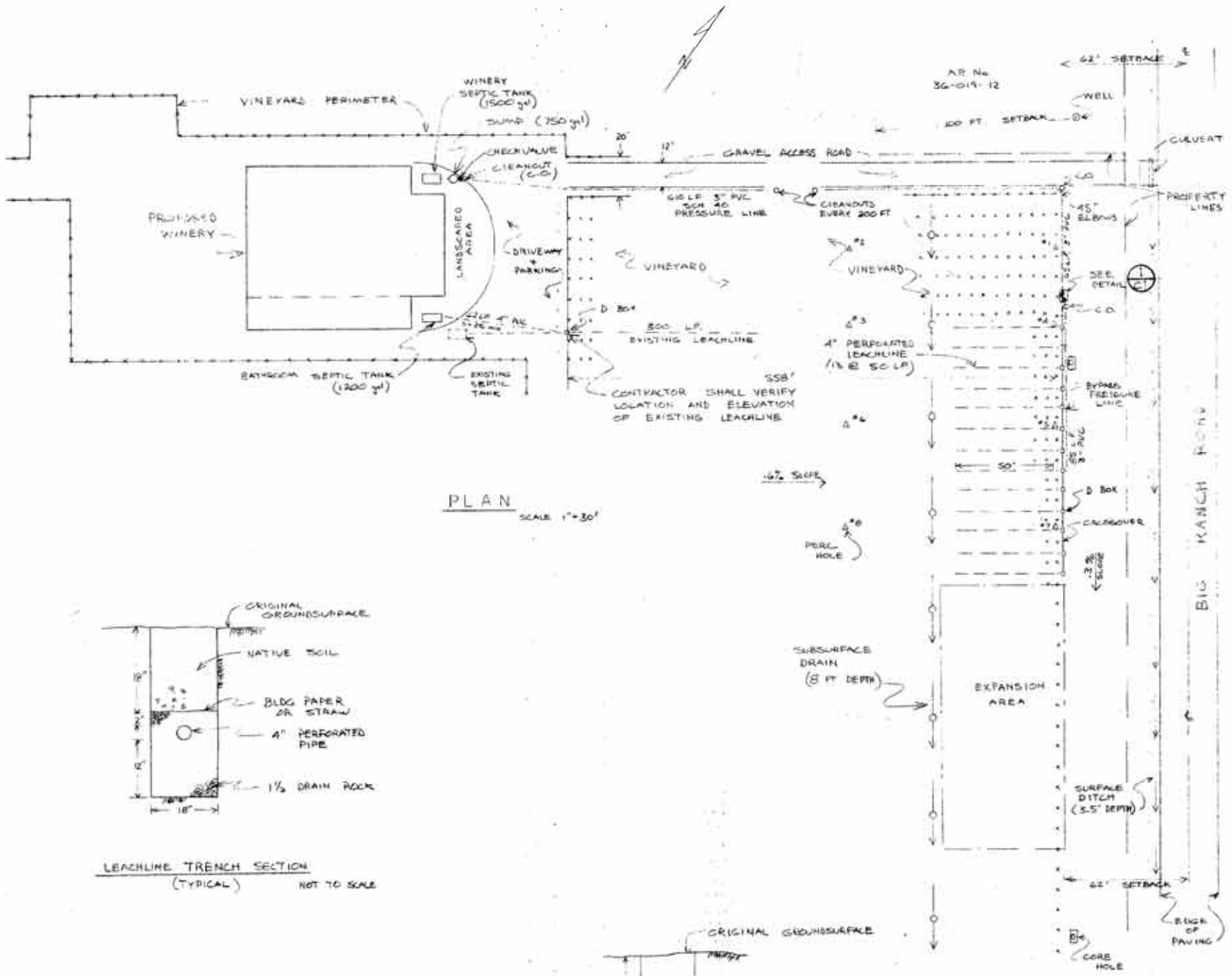
Additional Field Notes Inspected 7 lines (45') w/ D boxes and a 1200 gal septic tank. 6 lines are yet to be inspected and sump pump & alarm. 6/26/87 I inspected 8 x 45' lines this date, D boxes ok 6-29-87 MC

Plot Plan Accuracy Checked

Date of Final ____ Inspector ____

Date Bldg. Dept. Final ____ Inspector ____

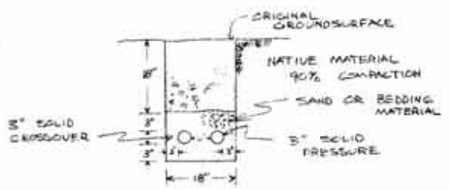
EHD-10:10/86



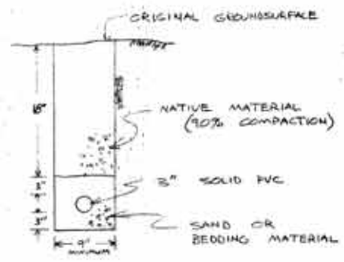
PLAN

SCALE 1"=30'

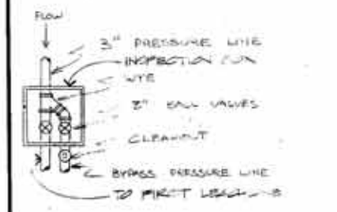
LEACHLINE TRENCH SECTION (TYPICAL) NOT TO SCALE



CROSSOVER TRENCH SECTION (TYPICAL) NOT TO SCALE



PRESSURE LINE TRENCH SECTION (TYPICAL) NOT TO SCALE



1 INSPECTION BOX NTS

VICINITY MAP

NOTES:

1) All work shall conform to Chapter 11, Section 1101 to 1119 (inclusive) of the Uniform Plumbing Code and to Napa County Sewage Ordinance Title V, Article 3.
2) Crushed rock shall be sound rock, gravel, slag, or other suitable material graded evenly from a 3/4" min. to 1½" max. and shall contain no deleterious material or decomposable matter.
3) Crossover pipes between leachlines shall be graded to cause each preceding pipe to be full before activating the succeeding line. Each sewer pipe or riser installed with a 2½" rise from preceding leachline invert. Connector pipe shall contain no perforations and have water-tight joints.
4) Connections between the building sewer and treatment tank and D boxes shall be laid with water-tight joints on natural ground or compacted (90%) min. fill.
5) Contractor to comply with applicable Cal-OSHA requirements.
6) Sump pump to be 1hp Sta Rite 3HUB Series I (or equal) with water level controls and high water alarm.
7) Pump and pump control system proposed to be used shall be submitted to the Engineer for approval. See detail sheets for sump options and control specs.
8) Perforated leachline pipe laid on a level grade with perforations on the underside.
9) Existing septic tank shall be destroyed and backfilled (95% compaction). New septic tank, solid line, and D box connect to the existing leachfield at the vineyard edge.
10) If PVC sewer pipe is used under driveways, it shall be double encased (sleeved) with ABS SCH 40, cast iron or concrete pipe. Sleeves extend 5 feet past the driveway edges.
11) D boxes shall conform to Environmental Health specifications dated 7-1-87.
12) If manufactured sump is used, installation of a second sump is necessary. Second pump and controls can be added later.

APPROVED
Approval of these plans does not authorize or approve any omission or deviation from environmental health standards as listed and/or shown.
One set of approved plans shall be available on the project site at all times.
Napa County, Building Department
Napa, California
By: 4/13 4010
Date: 5/27/87 By:

KM design team
1040 main st.
suite no. 305
napa, ca. 94559
707 257 3602

REVISIONS:

A.P. NO. 36-190-11

H_2O ENGINEERING CO.

KNOLLWOOD VINEYARDS

SEWAGE DISPOSAL SYSTEM

4101 BIG RANCH ROAD
NAPA, CA.

JAMES FRANCIEWICZ 2-26-87

C-1 of 1

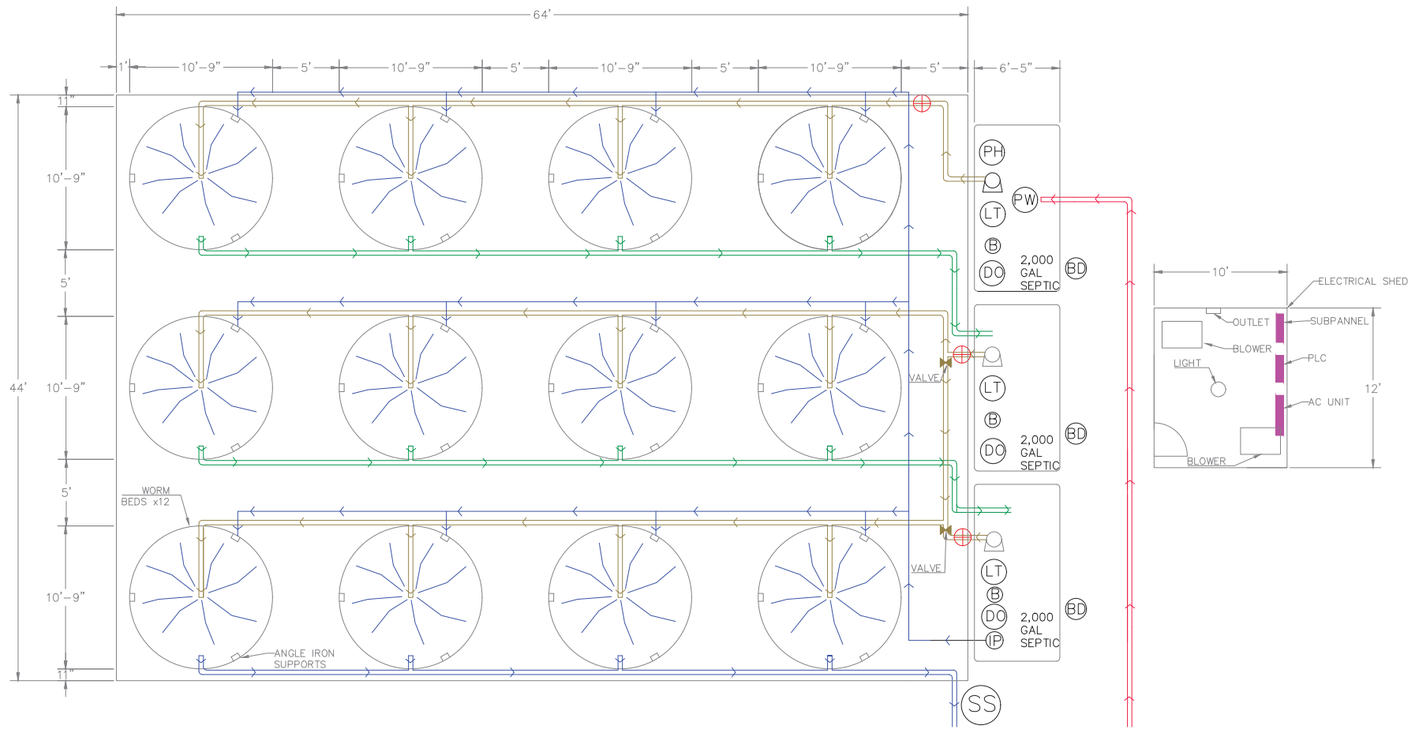
SHEET NO.

ATTACHMENT 4

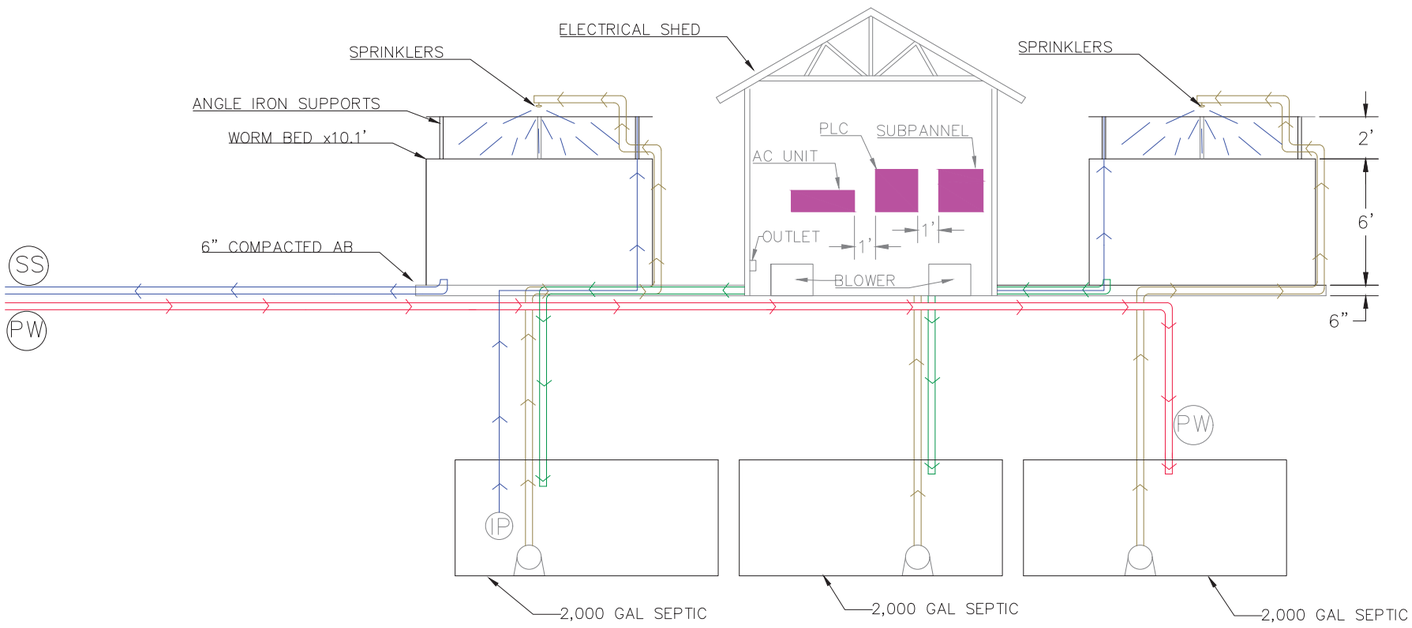
Vitalis System Layout

WATER FLOW

PLAN VIEW



RIGHT VIEW



NOTES

- ⊗ : BALL SWITCH VALVE
- ——— : ELECTRICAL CONDUIT
- ⌓ : ¾ HP SUBMERSIBLE GRINDING TRANSFER PUMP
- (LT) : LEVEL TRANSMITTER
- (B) : BACTERIA DOSING PUMP
- (PH) : PH DOSING PUMP
- (DO) : DISSOLVED OXYGEN SENSOR
- (IP) : IRRIGATION PUMP
- (BD) : BACTERIAL DRUM (20 GAL)
- (PW) : 2" PWW PRESSURE LINE IN
- (SS) : 4" PWW GRAVITY LINE OUT @ 2% MINIMUM
- ——— : FLOW FROM FACILITY TO SEPTIC
- ——— : FLOW FROM SEPTIC TO WORM BED
- ——— : GRAVITY FLOW TO SEPTIC TANK
- ——— : RECYCLED WATER
- ——— : IRRIGATED WATER TO LIVING MOSS ROOF

Revisions:

REALM ENGINEERING
CIVIL ENGINEERING, SURVEYING & PLANNING
1767 MARKET STREET SUITE C
REDDING, CA. 96001
530-526-7493

Plans Prepared Under the Supervision of:

REGISTERED PROFESSIONAL ENGINEER
JASON B. VITE
No. 67800
Exp. 6/30/19
CIVIL
STATE OF CALIFORNIA

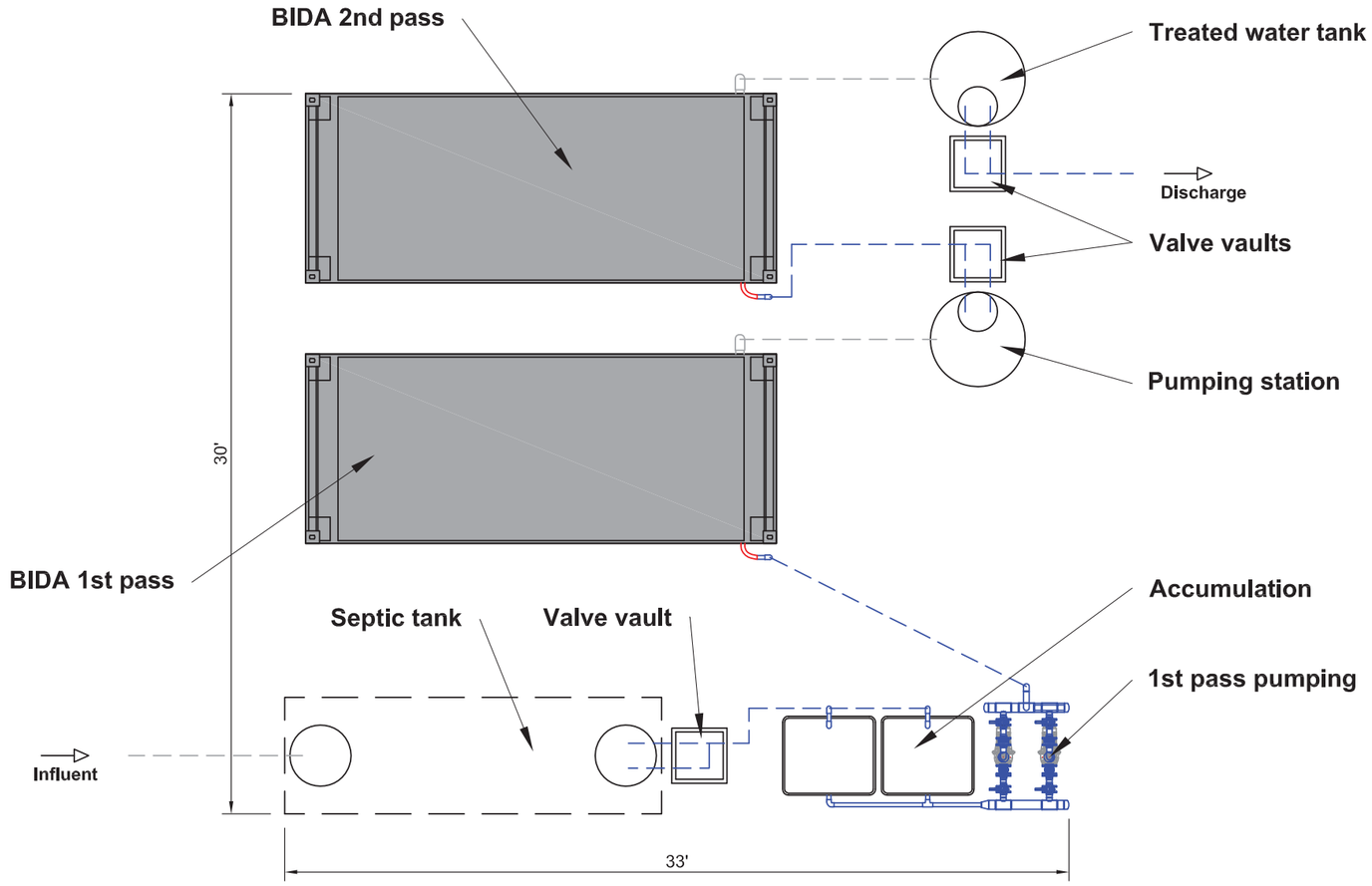
KNOLLWOOD VINEYARDS
WATER FLOW

PLOTTED BY: ---
DATE PLOTTED: 07/18/18
SCALE OF DRAWING: SEE PLAN
JOB NUMBER:
CADD FILE:
SHEET: W1

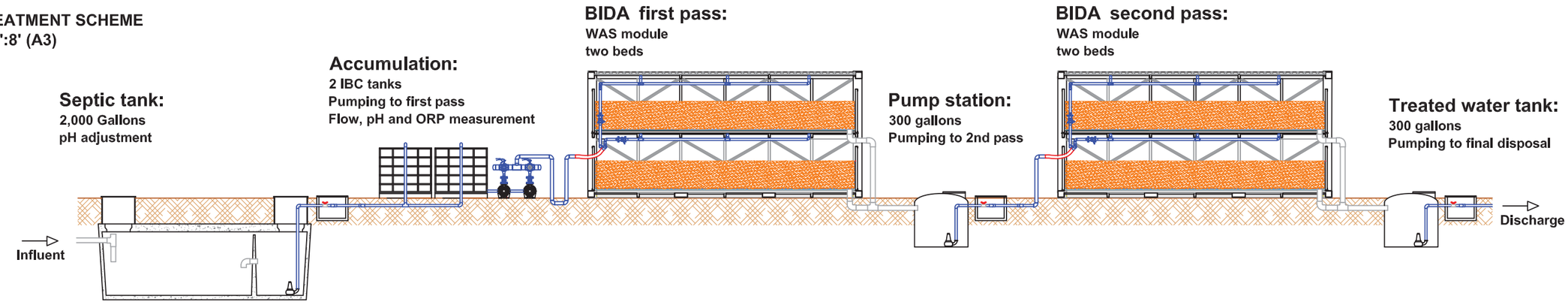
ATTACHMENT 5

Biofiltro System Layout

DISTRIBUTION PROPOSAL
S 1":6' (A3)



TREATMENT SCHEME
S 1":8' (A3)



Measured in feet

Reviewed and approved Matías Sjögren Raab	Date 2018 / 09	Client Knollwood Vineyards	Title Treatment scheme and distribution proposal, 1,200 GD		Scale Indicated	Biofiltro Hernando de Aguirre 201, of. 1301 Providencia - Santiago - Chile	BIOFILTRO REVITALIZE WATER
Drawn Ignacio Vera	Key U18.21	Location 4101 Big Ranch RD, Napa, CA 94558	Project Kevin Corley Winery wastewater treatment plant	Sheet 1 of 3	Version ver1		

ATTACHMENT 6

LYVE System Layout Description

TREATMENT SYSTEM LAYOUT

The major components of the Lyve Wastewater Treatment System and their dimensions and footprints are as follows:

- Sump underground tank: by others
- Filter Canister Screens: 3’ x 4’
- Packaged Plant: (EQ, MBBR, Activated Sludge, MBR, Sludge Digesters, and Equipment Cabinet): 38’ L x 8’ W
- Chemical tanks: two (2) poly tanks, 4’ diameter each
- One Blower: 3’ W by 4’ L
- Effluent Storage Tank: by others

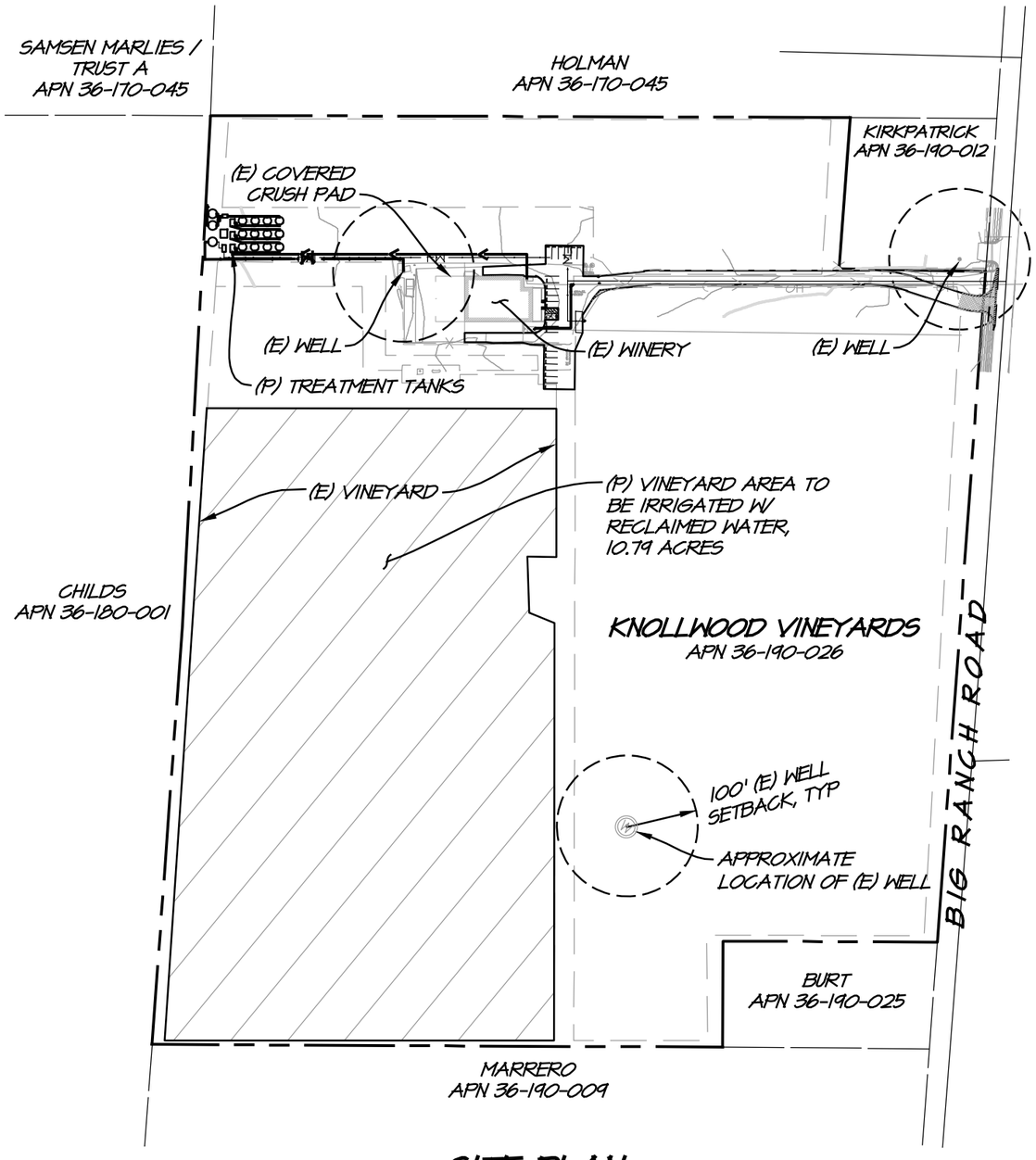
The overall footprint required for the above ground equipment is 44’ long by 17’ wide.

ATTACHMENT 7

Irrigation Water Balance

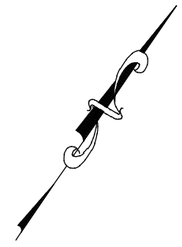
KNOLLWOOD VINEYARDS
VINEYARD IRRIGATION AREAS EXHIBIT

NAPA COUNTY CALIFORNIA



SITE PLAN

SCALE: 1" = 200'



GRAPHIC SCALE

200 0 200 400

(IN FEET)
1 inch = 200 FT

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AUG 06, 2018 4117060.0 Exh-Vine Irrigation Areas.dwg

Knollwood Vineyards
Reclaimed Process Wastewater
Water Balance for Irrigation and Storage

Project Description		Annual Process Waste Flow Volume		
Project Number:	4117060.0	Wine Production:	40,000	gal/year
Project Name:	Knollwood Vineyards			
Prepared By:	Rafael Turcios	Annual Process Waste per Gallon Wine:	5	gal/year
Date:	July 27, 2018	Total Annual Process Waste Generated:	200,000	gal/year

Vineyard Irrigation Parameters		Landscape Irrigation Parameters		
Acres of irrigated vineyard:	10.79 acres	Crop type / name:	Native grass and trees	
Row spacing:	6.2 feet	Total irrigated acres of crop:	0.00 acres	
Vine spacing:	6.0 feet			
Total number of vines:	12,737 vines			
Water use per vine per month (peak):	26 gal			
Total peak monthly irrigation demand:	331,174 gal			

Monthly Process Wastewater Generation

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monthly process wastewater generated as % of annual total:	4%	6%	6%	5%	6%	7%	9%	10%	14%	14%	11%	8%
Monthly process wastewater generated [gallons]:	8,000	12,000	12,000	10,000	12,000	14,000	18,000	20,000	28,000	28,000	22,000	16,000

Monthly Vineyard Irrigation Water Use

(Based on per-vine water use)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Beginning of month reclaimed water in storage [gallons] (This number brought forward from end of previous month)	0	0	0	0	0	0	0	0	0	0	0	0
Vineyard irrigation as % of peak month irrigation demand:	6%	6%	10%	100%	100%	100%	100%	100%	100%	100%	10%	10%
Irrigation per month per vine (gallons):	2	2	3	26	26	26	26	26	26	26	3	3
Total vineyard irrigation demand [gallons]:	19,870	19,870	33,117	331,174	331,174	331,174	331,174	331,174	331,174	331,174	33,117	33,117
Will vineyard be irrigated with reclaimed water this month?	y	y	y	y	y	y	y	y	y	y	y	y
Process wastewater generated this month, reclaimed for vineyard irrigation [gallons]	8,000	12,000	12,000	10,000	12,000	14,000	18,000	20,000	28,000	28,000	22,000	16,000
Remaining vineyard irrigation demand after using this month's process water [gallons]	11,870	7,870	21,117	321,174	319,174	317,174	313,174	311,174	303,174	303,174	11,117	17,117
Drawdown from storage for remaining vineyard irrigation [gallons]	0	0	0	0	0	0	0	0	0	0	0	0
Well water required to satisfy remaining vineyard irrigation demand	11,870	7,870	21,117	321,174	319,174	317,174	313,174	311,174	303,174	303,174	11,117	17,117
Net storage after vineyard irrigation drawdown [gallons]	0	0	0	0	0	0	0	0	0	0	0	0
This month's process wastewater, remaining after vineyard irrigation, available for landscape irrigation[gallons]	0	0	0	0	0	0	0	0	0	0	0	0

Water balance continues on next page for cover crop irrigation.

Monthly Landscape Irrigation Water Use

(Based on evapotranspiration crop demand and irrigated area)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
This month's process wastewater, remaining after vineyard irrigation, available for landscape irrigation[gallons] *(From sheet 1)*	0	0	0	0	0	0	0	0	0	0	0	0
Reference ET (ETo) (in/month) (see note 1)	1.24	1.68	3.41	4.8	6.2	6.9	7.44	6.51	5.1	3.41	1.8	0.93
Crop Coefficient (k_c) (see note 2)	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Crop water demand per acre [inches]	0.99	1.34	2.73	3.84	4.96	5.52	5.95	5.21	4.08	2.73	1.44	0.74
Crop water demand per acre [gallons]	26,935	36,493	74,072	104,265	134,676	149,881	161,611	141,410	110,782	74,072	39,099	20,201
Total crop water demand for irrigated area [gallons]	0	0	0	0	0	0	0	0	0	0	0	0
Will landscape be irrigated with reclaimed water this month?	Y	Y	Y	N	N	N	N	N	N	Y	Y	Y
Process wastewater remaining after vineyard irrigation, reclaimed for landscape irrigation [gallons]	0	0	0	0	0	0	0	0	0	0	0	0
Landscape irrigation water required from storage or other source [gallons]	0	0	0	0	0	0	0	0	0	0	0	0
Drawdown from storage for landscape irrigation [gallons]	0	0	0	0	0	0	0	0	0	0	0	0
Process wastewater generated this month, unused for irrigation, to be reclaimed and stored [gallons]	0	0	0	0	0	0	0	0	0	0	0	0
Net end-of-month reclaimed water storage after all irrigation [gallons]	0	0	0	0	0	0	0	0	0	0	0	0

End of Water Balance

Peak Monthly Storage = 0 gallons

Notes:

1. Reference ETo from California Irrigation Management Information System
2. Crop Coefficient from Table 1 of "Estimating Irrigation Water Needs of Landscape Plantings in California", University of California Cooperative Extension, August 2000.