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## Wastewater Feasibility Study

A. S. Vineyards Use Permit Modification – P19-00273  
Zoning Administrator Hearing Date (January 27, 2021)

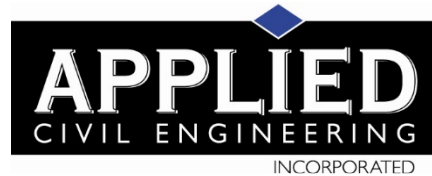
ONSITE WASTEWATER DISPOSAL FEASIBILITY STUDY  
FOR THE  
SODHANI WINERY USE PERMIT MODIFICATION

LOCATED AT:  
3283 St. Helena Highway North  
St. Helena, CA 94574  
NAPA COUNTY APN 022-080-028

PREPARED FOR:  
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San Francisco, CA 94121

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Revision #1

*Michael R. Muelrath*

Michael R. Muelrath R.C.E. 67435

5/8/2020

Date



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## INTRODUCTION

Arvind Sodhani is applying for a Use Permit Modification to adjust the operational characteristics for a new winery at his property located at 3283 St. Helena Highway North in Napa County, California. The subject property, known as Napa County Assessor's Parcel Number 022-080-028 is accessed directly off of State Route 29, approximately 0.5 miles north of the intersection of State Route 29 and Ehlers Lane. The winery has been issued a Use Permit (P14-00402) but the facility has not yet been constructed.

The Use Permit Modification application under consideration proposes the following operational characteristics:

- Wine Production:
  - 20,000 gallons of wine per year
  - Crushing, fermenting, aging and bottling
  
- Employees:
  - 2 full time employees
  - 2 part time employees
  
- Marketing Plan:
  - Daily Tours and Tastings by Appointment
    - 11 visitors per day maximum
  - Private Food and Wine Pairings
    - 30 guests maximum
    - 10 events per year
    - Food prepared offsite by caterers
  - Private Wine Club and Release Events
    - 100 guests maximum
    - 1 event per year
    - Food prepared by offsite catering company
    - Portable toilets brought in for guests

Existing improvements on the property include a single family residence, accessory structures, approximately 6.3 acres of vineyard and the related access and utility infrastructure. Domestic wastewater from the existing residence is collected in a septic tank and disposed of in a leach field located just northeast of the residence, above the vineyard. Please refer to the Sodhani Winery Use Permit Modification Conceptual Site Plans for approximate locations of existing and proposed features.

Arvind Sodhani has requested that Applied Civil Engineering Incorporated (ACE) evaluate the feasibility of disposing of the winery process wastewater as well as the domestic sanitary wastewater that will be generated by the proposed winery via a new onsite wastewater disposal system as part of the proposed Use Permit Modification. The remainder of this report describes the onsite soil conditions, the predicted process and sanitary wastewater flows and outlines the conceptual design of an onsite wastewater disposal system to serve the new winery facility as proposed under this Use Permit Modification application. The systems outlined in this report

are similar to those of the original use permit with adjustments made to accommodate the proposed changed in use permit parameters.

## **SOILS INFORMATION**

The United States Department of Agriculture Soil Conservation Service Soils Map for Napa County shows the entire property mapped as Boomer gravelly loam, 15 to 30 percent slopes.

A site specific soils analysis was conducted during site evaluations performed by Napa County on April 10, 2003 and April 23, 2003. The site evaluation consisted of the excavation and observation of eight test pits in vineyard portion of the property. The test pits generally revealed uniform soil conditions consisting of approximately 72 inches of acceptable clay loam soil.

Two additional site evaluations were performed by Napa County and Applied Civil Engineering Incorporated on December 6, 2016 to evaluate additional onsite areas and an area on a neighboring property that was subsequently added to the subject property via a lot line adjustment.

Please refer to the Site Evaluation Reports in Appendix 4 for additional details.

## **PREDICTED WASTEWATER FLOW**

The onsite wastewater disposal system will be designed for the peak winery process wastewater flow and the peak sanitary wastewater flow from the proposed winery. The existing residence septic system will continue to serve the existing residence and reserve area for the two bedroom residence will also be included in the design of the new septic system reserve area.

### **Winery Process Wastewater**

We have used the generally accepted standard that six gallons of winery process wastewater are generated for each gallon of wine that is produced each year and that 1.5 gallons of wastewater are generated during the crush period for each gallon of wine that is produced. Based on the size of the winery and our understanding that both red and white wines will be produced we have assumed a 30 day crush period. Using these assumptions, the average and peak winery process wastewater flows are calculated as follows:

$$\text{Annual Winery Process Wastewater Flow} = \frac{20,000 \text{ gallons wine}}{\text{year}} \times \frac{6 \text{ gallons wastewater}}{1 \text{ gallon wine}}$$

$$\text{Annual Winery Process Wastewater Flow} = 120,000 \text{ gallons per year}$$

$$\text{Average Daily Winery Process Wastewater Flow} = \frac{120,000 \text{ gallons}}{\text{year}} \times \frac{1 \text{ year}}{365 \text{ days}}$$

$$\text{Average Daily Winery Process Wastewater Flow} = 329 \text{ gallons per day (gpd)}$$

$$\text{Peak Winery Process Wastewater Flow} = \frac{20,000 \text{ gallons wine}}{\text{year}} \times \frac{1.5 \text{ gallons wastewater}}{1 \text{ gallon wine}} \times \frac{1 \text{ year}}{30 \text{ crush days}}$$

Peak Winery Process Wastewater Flow = 1,000 gpd

### **Winery Sanitary Wastewater**

The peak sanitary wastewater flow from the winery facility is calculated based on the number of winery employees, the number of daily visitors for tastings and the number of guests attending scheduled marketing events. In accordance with Table 4 of the Napa County “Regulations for Design, Construction, and Installation of Alternative Sewage Treatment Systems” we have used a design flow rate of 15 gallons per day per employee and 3 gallons per day per visitor for tastings. Table 4 does not specifically address design wastewater flows for guests at marketing events. Since all events will be catered we have conservatively assumed 5 gallons of wastewater per guest at marketing events.

Based on these assumptions, the peak winery sanitary wastewater flows are calculated as follows:

#### Employees

Peak Sanitary Wastewater Flow = 4 employees X 15 gpd per employee

Peak Sanitary Wastewater Flow = 60 gpd

#### Daily Tastings

Peak Sanitary Wastewater Flow = 11 visitors per day X 3 gallons per visitor

Peak Sanitary Wastewater Flow = 33 gpd

#### Marketing Event with Catered Meal (10 per year)

Peak Sanitary Wastewater Flow = 30 guests X 5 gallons per guest

Peak Sanitary Wastewater Flow = 150 gpd

#### Marketing Event with Catered Meal (1 per year)

Peak Sanitary Wastewater Flow = 100 guests X 5 gallons per guest

Peak Sanitary Wastewater Flow = 500 gpd

#### Total Peak Winery Sanitary Wastewater Flow

In order to manage the peak sanitary wastewater flows a maximum of one event will be scheduled each day. Furthermore, for any events with more than 30 guests in attendance portable toilets will be used. Therefore, the worst case peak winery sanitary wastewater flow is calculated based on 4 employees, 11 visitors for tastings and a marketing event with 30 guests and a meal prepared by a caterer offsite. The peak flow for this scenario is calculated as follows:

Total Peak Winery Sanitary Wastewater Flow = 60 gpd + 33 gpd + 150 gpd

Total Peak Winery Sanitary Wastewater Flow = 243 gpd

### **Combined Peak Wastewater Flow**

Combined Peak Wastewater Flow = Peak Winery Process Wastewater Flow + Total Peak Winery Sanitary Wastewater Flow

Combined Peak Flow = 1,000 gpd + 243 gpd

Combined Peak Flow = 1,243 gpd

### **RECOMMENDATIONS**

Based on the proposed site configuration, onsite soil conditions and estimated wastewater flows we have determined that there are at least three options for properly disposing of the process and sanitary wastewater generated at the proposed winery. A summary of each option is presented in the following sections of this report.

#### **Option #1 – Sanitary Wastewater Subsurface Drip Disposal Field and Process Wastewater Hold and Haul**

In this scenario the sanitary wastewater would be disposed of in a subsurface drip type septic system and the winery process wastewater would be collected separately, temporarily stored and then would be hauled offsite for treatment and disposal by the Napa Sanitation District, East Bay Municipal Utility District or a similar municipal wastewater treatment plant.

##### Required Disposal Field Area

The disposal field area is calculated based upon the design hydraulic loading rate for the soil conditions and the proposed design flow. Since the slope of the natural ground surface in the area of the proposed disposal field is more than 20% a 150% adjustment factor is required to accommodate for the steep slopes. Based on these design parameters, the required disposal field area is calculated as follows:

$$\text{Required Disposal Field Area} = \frac{\text{Peak Flow}}{\text{Soil Application Rate}} \times 150\%$$

$$\text{Required Disposal Field Area} = \frac{243 \text{ gpd}}{0.6 \text{ gpd per square foot}} \times 150\%$$

$$\text{Required Disposal Field Area} = 608 \text{ square feet}$$

##### Available Disposal Field Area

Based on the proposed site layout and topographic data prepared by Albion Surveys, we have determined that there is enough area to install at least 610 square feet of subsurface drip disposal



field in the vicinity of Test Pits #3B, #4B, #6B & #7B. The conceptual layout of the disposal field is shown on the Sodhani Winery Use Permit Modification Conceptual Site Plans in Appendix 2.

#### Pretreatment and Septic Tank Capacity

Pretreatment must be provided to treat the wastewater to meet Napa County pretreated effluent standards (BOD<30 mg/l, TSS < 30 mg/l). There are several options for pretreatment systems that are available to meet this requirement. The Applicant and the Engineer will review options and select a suitable pretreatment system designed to meet this requirement prior to application for a sewage permit for the winery. Septic tanks will be sized in accordance with the requirements of the selected pretreatment system.

#### Reserve Area

Napa County code requires that an area be set aside to accommodate a future onsite wastewater disposal system in the event that the primary system fails or the soil in the primary area is otherwise rendered unsuitable for wastewater disposal. For subsurface drip type septic systems the reserve area must be 200% of the size of the disposal field area. The required reserve area must include capacity for the existing two bedroom residence (240 gpd) and is calculated as follows:

$$\text{Required Reserve Area} = 200\% \times \frac{\text{Peak Flow}}{\text{Soil Application Rate}} \times 150\%$$

$$\text{Require Reserve Field Area} = 200\% \times \frac{483 \text{ gpd}}{0.6 \text{ gpd per square foot}} \times 150\%$$

$$\text{Required Reserve Area} = 2,415 \text{ square feet}$$

Based on the proposed site plan we have determined that there is enough area to set aside for at least an additional 2,415 square feet of subsurface drip disposal field in the vicinity of Test Pits #6 and #7 as shown on the Sodhani Winery Use Permit Modification Conceptual Site Plans in Appendix 2.

#### Winery Process Wastewater Disposal

The winery process wastewater hold and haul system must be designed to hold at least seven days of peak flow (7 days × 1,000 gallons per day = 7,000 gallons), have a water level alarm and be designed and constructed in accordance with the requirements for hold and haul systems as outlined in Napa County Code Section 13.52.035.

## Winery Process Wastewater Disposal Reserve Area

Napa County Code requires that an onsite “reserve area” be designated for process wastewater hold and haul systems. The reserve area will be onsite pre-treatment and irrigation as described in Option #2 below.

### **Option #2 – Sanitary Wastewater Subsurface Drip Disposal Field and Process Wastewater Treatment for Irrigation**

In this scenario the sanitary wastewater would be disposed of in a subsurface drip type septic system and the winery process wastewater would be collected separately, pretreated, stored and disposed of via surface irrigation in the vineyard, landscaping or on natural vegetation outside of the required well setbacks.

#### Required Disposal Field and Reserve Area

Sanitary wastewater disposal field and reserve areas are the same as described in Option #1 above.

#### Pretreatment and Septic Tank Capacity

Sanitary wastewater pretreatment and septic tank requirements in this scenario are the same as previously described in Option #1 above.

#### Process Wastewater Treatment & Disposal

We recommend that treatment be achieved through the use of a package plant type system or other treatment system designed to accept winery process wastewater that is capable of meeting the following treatment requirements:

<u>Parameter</u>	<u>Pre-treatment*</u>	<u>Post Treatment**</u>
pH	3 to 10	6 to 9
BOD <sub>5</sub>	500 to 12,000 mg/l	<160 mg/l
TSS	40 to 800 mg/l	<80 mg/l
SS	25 to 100 mg/l	<1 mg/l

\* Reference California Regional Water Quality Control Board Central Coast Region General Waste Discharge Requirements Order No. R3-2008-0018 for winery process wastewater characteristics

\*\* Required for discharge to land via surface irrigation by Napa County for samples taken at the discharge of the treatment unit.

### Process Wastewater Disposal

To simplify this analysis we have assumed that final disposal of the treated effluent will be via surface drip irrigation in the vineyard. There are approximately 5.9 acres of vineyard area available outside of the required well setbacks. The treated process wastewater may also be able to be used for landscape irrigation outside of all required setbacks which would provide additional flexibility in operation of the disposal system. All application of treated winery process wastewater must comply with the requirements of the Napa County Winery Process Wastewater Guidelines for Surface Drip Irrigation and general wastewater setback requirements.

In order to accommodate differences in the timing of wastewater generation, irrigation demand and prohibitions on applying water to the land during rainy periods a storage tank will be required. We have prepared a water balance calculation to size a tank that will temporarily store wastewater generated at the winery before it is applied to the vineyard. The water balance calculation assumes a monthly wastewater generation rate and a monthly vineyard irrigation schedule based on our past experience with projects of this type. The water balance calculations show that the water generated by winery production operations each month can be effectively managed after treatment by applying it to the identified vineyard area. We recommend a minimum storage tank capacity of 10,000 gallons to provide operational flexibility in timing of land applications (see Appendix 4).

### **Option #3 Sanitary and Process Wastewater Subsurface Drip Disposal Field**

In this scenario the sanitary and process wastewater streams from the winery would be combined, pretreated and disposed of via a subsurface drip disposal field similar to the disposal field described in Option #1 and Option #2.

#### Required Disposal Field Area

The disposal field area is calculated based upon the design hydraulic loading rate for the soil conditions and the proposed design flow. Since the slope of the natural ground surface in the area of the proposed disposal field is more than 20% a 150% adjustment factor is required to accommodate for the steep slopes. The system must accommodate the peak flow from the winery sanitary wastewater (243 gpd), and the winery process wastewater flow (1,000 gpd) for a total of 1,243 gpd. Based on these design parameters, the required disposal field area is calculated as follows:

$$\text{Required Disposal Field Area} = \frac{\text{Peak Flow}}{\text{Soil Application Rate}} \times 150\%$$

$$\text{Required Disposal Field Area} = \frac{1,243 \text{ gpd}}{0.6 \text{ gpd per square foot}} \times 150\%$$

$$\text{Required Disposal Field Area} = 3,108 \text{ square feet}$$

### Available Disposal Field Area

Based on the proposed site layout and topographic data prepared by Albion Surveys, we have determined that there is enough area to install at least 3,500 square feet of subsurface drip disposal field in the vicinity of Test Pits #3B, #4B, #6B & #7B. The conceptual layout of the disposal field is shown on the Sodhani Winery Use Permit Modification Conceptual Site Plans in Appendix 2.

### Pretreatment and Septic Tank Capacity

Pretreatment must be provided to treat the sanitary and process wastewater to meet Napa County pretreated effluent standards (BOD < 30 mg/l, TSS < 30 mg/l). There are several options for pretreatment systems that are available to meet this requirement. The Applicant and the Engineer will review options and select a suitable pretreatment system designed to meet this requirement prior to application for a sewage permit for the winery. Septic tanks will be sized in accordance with the requirements of the selected pretreatment system.

### Reserve Area

Napa County code requires that an area be set aside to accommodate a future onsite wastewater disposal system in the event that the primary system fails or the soil in the primary area is otherwise rendered unsuitable for wastewater disposal. For subsurface drip type septic systems, the reserve area must be 200% of the size of the disposal field area. The required reserve area must include capacity for the existing two bedroom residence (240 gpd) and is calculated as follows:

$$\text{Required Reserve Area} = 200\% \times \frac{\text{Peak Flow}}{\text{Soil Application Rate}} \times 150\%$$

$$\text{Require Reserve Field Area} = 200\% \times \frac{1,483 \text{ gpd}}{0.6 \text{ gpd per square foot}} \times 150\%$$

*Required Reserve Area = 7,415 square feet*

Based on the proposed site plan we have determined that there is enough area to set aside for at least an additional 8,200 square feet of subsurface drip disposal field in the vicinity of Test Pits #6 and #7 as shown on the Sodhani Winery Use Permit Modification Conceptual Site Plans in Appendix 2.

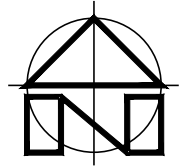
## **CONCLUSION**

It is our opinion that the wastewater from the proposed winery can be accommodated in either of the three options previously described. Full design calculations and construction plans for the wastewater system(s) must be prepared in accordance with Napa County standards at the time of building permit application.

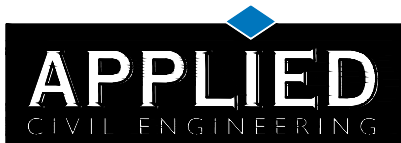
APPENDIX I: Site Topography Map

# SITE TOPOGRAPHY MAP

REPRESENTS A PORTION OF THE  
UNITED STATES GEOLOGICAL SURVEY 7.5 MINUTE QUADRANGLES  
"CALISTOGA, CA AND SAINT HELENA, CA "



SCALE: 1" = 2,000'



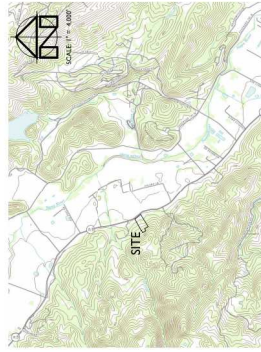
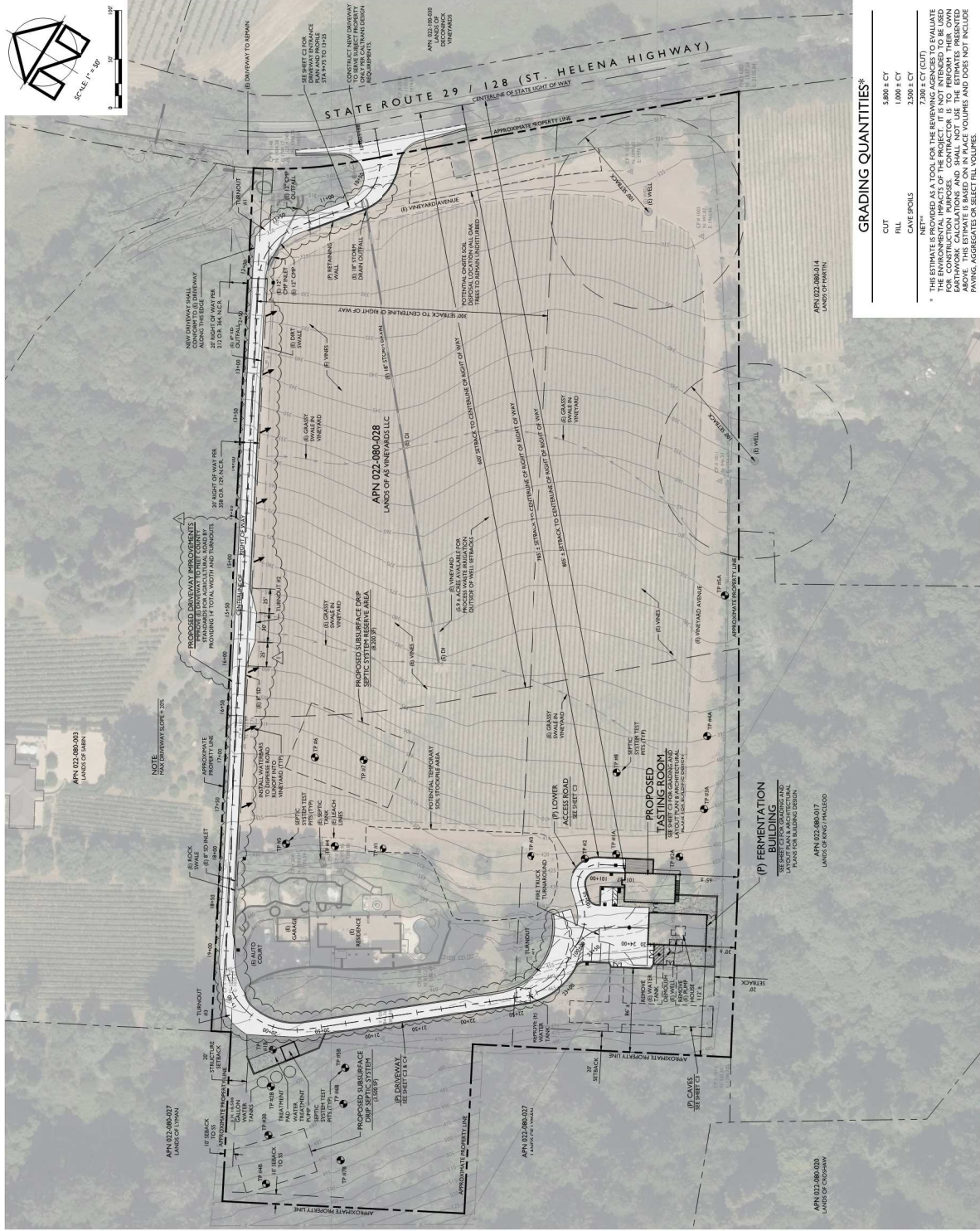
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**SODHANI WINERY**  
3283 ST. HELENA HIGHWAY NORTH  
ST. HELENA, CA 94574  
APN 022-080-004

APPENDIX 2: Sodhani Winery Use Permit Modification Conceptual Site Plans  
Reduced to 8.5" x 11"

# SODHANI WINERY

## USE PERMIT MODIFICATION CONCEPTUAL SITE IMPROVEMENT PLANS



LOCATION MAP  
SCALE 1" = 1,000'

### PROJECT INFORMATION:

PROPERTY OWNER & APPLICANT:  
AS VINEYARDS LLC  
CARE OF: ARVIND SODHANI  
85 21ST AVENUE  
SAN FRANCISCO, CA 94121

SITE ADDRESS:  
3283 ST. HELENA HIGHWAY NORTH  
ST. HELENA, CA 94574  
ASSESSOR'S PARCEL NUMBER:  
022-080-028  
PARCEL SIZE:  
11.11 ± ACRES  
PROJECT SIZE:  
2 ± ACRES

ZONING:  
AGRICULTURAL WATERSHED (AW)  
DOMESTIC WATER SOURCE:  
ON-SITE WELLS  
FIRE PROTECTION WATER SOURCE:  
STORAGE TANKS  
WASTEWATER DISPOSAL:  
ON-SITE TREATMENT AND DISPOSAL

### SHEET INDEX:

- C1 OVERALL SITE PLAN
- C2 DRIVEWAY ENTRANCE PLAN STA 9+88 TO STA. 13+25
- C3 WINERY GRADING AND LAYOUT PLAN
- C4 & STA. 100+00 TO 101+50
- C5 DRIVEWAY CROSS SECTIONS
- C6 STORMWATER CONTROL PLAN
- C7 IMPERVIOUS SURFACE EXHIBIT

### PROJECT DESCRIPTION:

THE PURPOSE OF THIS PROJECT IS TO ILLUSTRATE THE CONCEPTUAL DESIGN OF SITE IMPROVEMENTS PROPOSED AS PART OF THIS USE PERMIT MODIFICATION APPLICATION.

### FLOOD HAZARD NOTE:

THE PROJECT SITE IS NOT LOCATED IN A SPECIAL FLOOD HAZARD AREA.

### NOTES:

1. BACKGROUND INFORMATION: EXISTING TOPOGRAPHIC - FEATURE TOPOGRAPHIC INFORMATION WAS TAKEN FROM THE MAP OF TOPOGRAPHY OF A PORTION OF THE LANDS OF 300. ST. HELENA HIGHWAY, PREPARED BY ALBION ENGINEERING INCORPORATED ASSUMING NO LIABILITY REGARDING THE ACCURACY OR COMPLETENESS OF THE TOPOGRAPHIC INFORMATION. SAN FRANCISCO PUBLIC UTILITY INSTITUTE (SFPU) SAN FRANCISCO BAY AREA ORTHOPHOTOD; DATABASE DATED JUNE 2014 AND MAY NOT REPRESENT CURRENT CONDITIONS.
2. CONVEYOR: SHEET C1: 5' X 10' FEET; OTHER SHEETS: ONE (1) FOOT, HIGHLIGHTED EVERY FIVE (5) FEET.
3. BENCHMARK: NAPA COUNTY BENCHMARK NO. 055-41 ELEVATION = 349.19'
4. THE PROPERTY LINES SHOWN ON THESE PLANS DO NOT REPRESENT A BOUNDARY SURVEY. CONSULT A LICENSED LAND SURVEYOR TO VERIFY THE PROPERTY BOUNDARIES. THE PROPOSED PROPERTY LINES ARE PROPOSED NEAR ANY PROPERTY LINE OR REQUIRED PROPERTY LINE STRACKS.

### GRADING QUANTITIES\*

CUT	5,800 ± CY
FILL	1,000 ± CY
CAVE SPILLS	2,500 ± CY

\* THE ESTIMATE IS PROVIDED AS A TOOL FOR THE REVIEWING AGENCIES TO EVALUATE THE ENVIRONMENTAL IMPACTS OF THE PROJECT. IT IS NOT INTENDED TO BE USED FOR BIDDING OR CONTRACTING. THE ESTIMATE IS BASED ON THE PRESENTED ABOVE. THIS ESTIMATE IS BASED ON IN PLACE VOLUMES AND DOES NOT INCLUDE EXCESS SOIL CUT FROM THE PROJECT WILL BE PLACED IN THE SOIL DISPOSAL AREA OR WILL BE HAULED OFFSITE TO A LOCATION TO BE APPROVED BY NAPA COUNTY.

### OVERALL SITE PLAN SCALE 1" = 30'



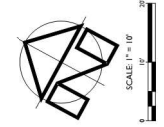
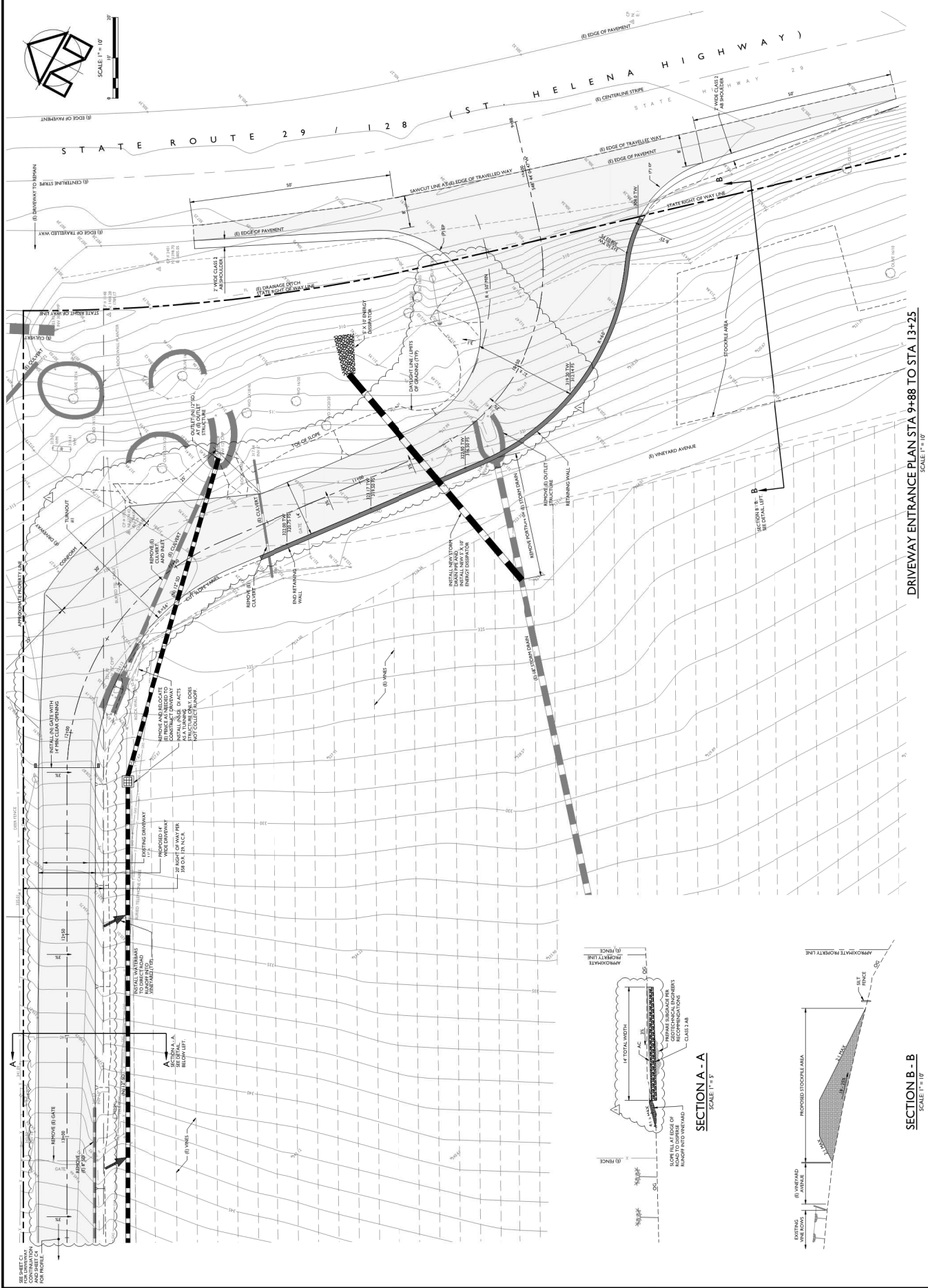




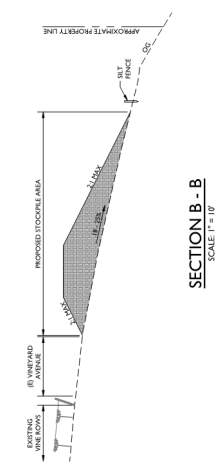
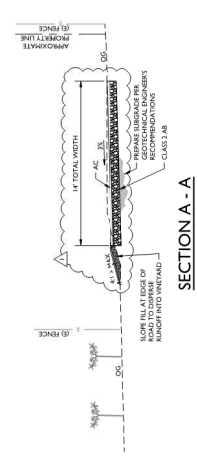
DRAWN BY: BlumCAD  
 CHECKED BY: PRM  
 DATE: MAY 8, 2020  
 REVISIONS:  
 NO. DATE BY  
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 2 05/08/20 PRM UP MODIFICATION REUBRITIAL

JOB NUMBER: 14-003  
 FILE: H:\ISS\CONC.DWG  
 ORIGINAL SIZE: 24" X 36"  
 SHEET NUMBER: C2

OF 7



**DRIVEWAY ENTRANCE PLAN STA 9+88 TO STA 13+25**  
 SCALE 1" = 10'





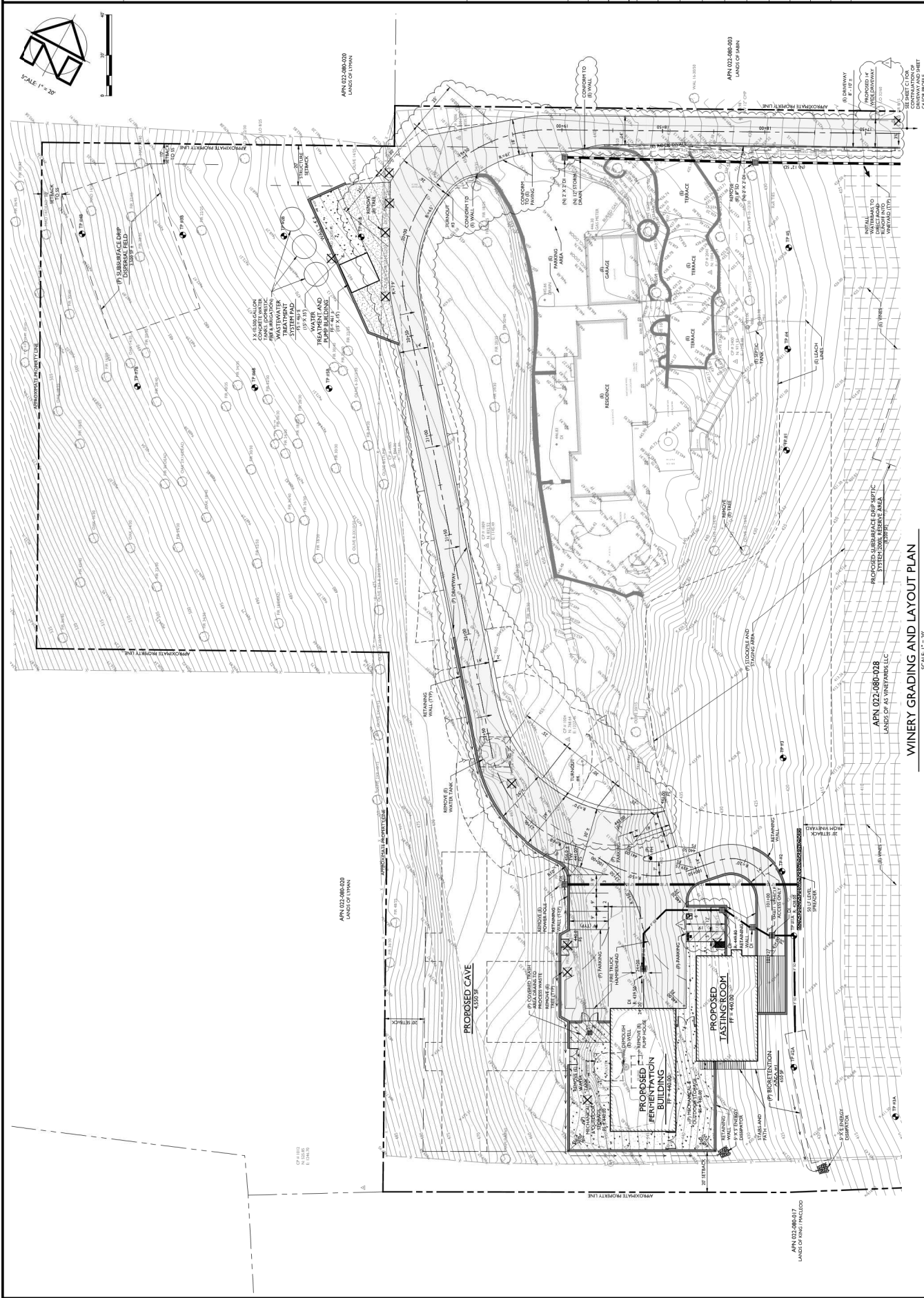
**APPLIED**  
 ENGINEERING INC.  
 2024 West Lincoln Avenue  
 Napa, CA 94558  
 (707) 254-8686 (707) 232-2795 fax  
 www.appliedcivil.com

**SODHANI WINERY**  
 USE PERMIT MODIFICATION CONCEPTUAL SITE IMPROVEMENT PLANS  
 PREPARED UNDER THE DIRECTION OF



DRAWN BY: **DMC/DMC**  
 CHECKED BY: **HRM**  
 DATE: **MAY 8, 2020**  
 REVISIONS: **BY: [initials]**  
 NO. **DATE**  
 1. **USE PERMIT REVIEW**  
 2. **NO UP MODIFICATION**  
 3. **REUBMITTAL**

JOB NUMBER: **14-103**  
 FILE: **H:\LIC\CONC\DWG\DWG**  
 ORIGINAL SIZE: **24" X 36"**  
 SHEET NUMBER: **C3** OF **7**

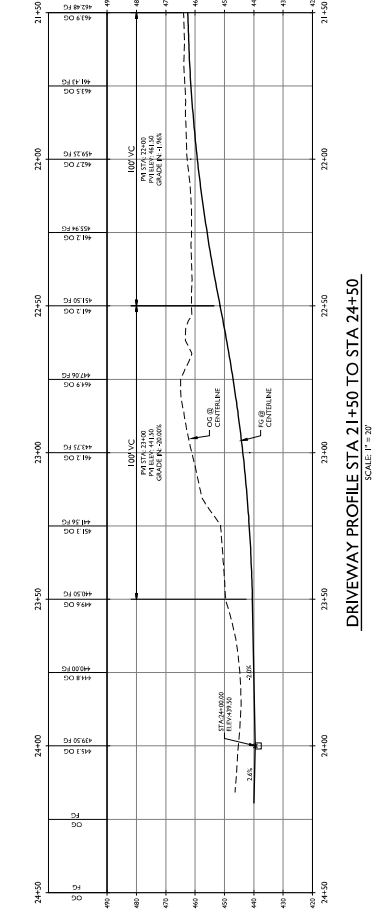
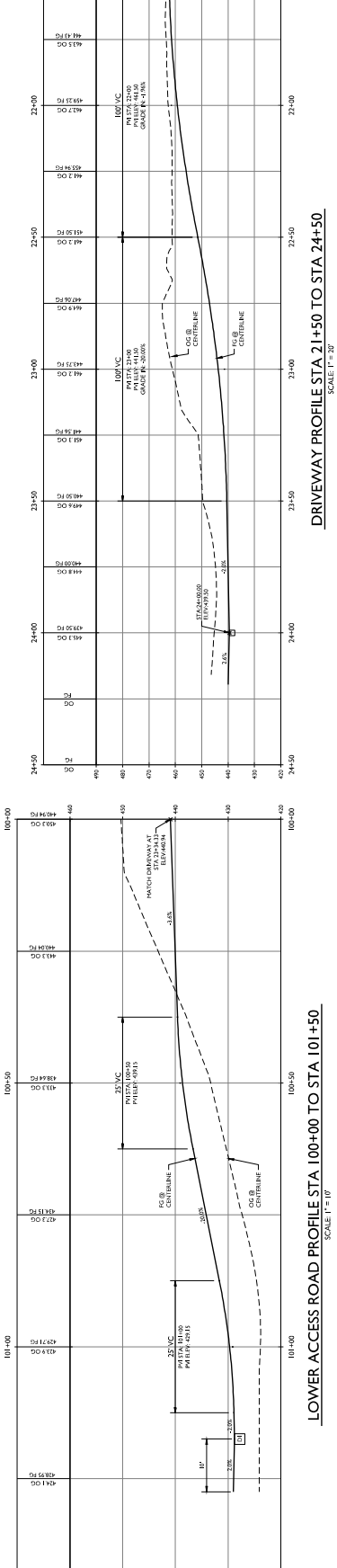
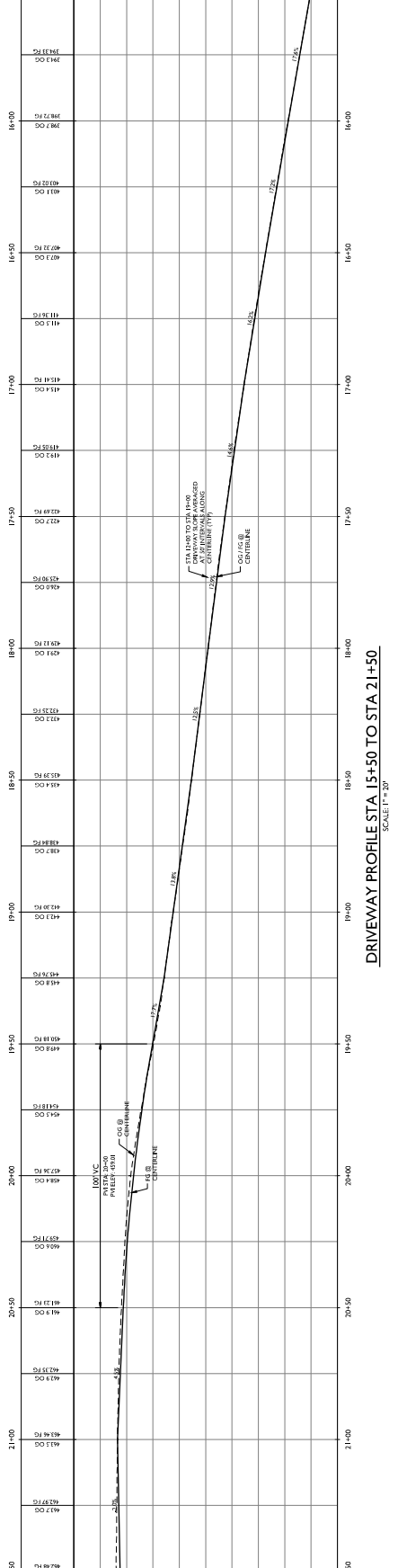
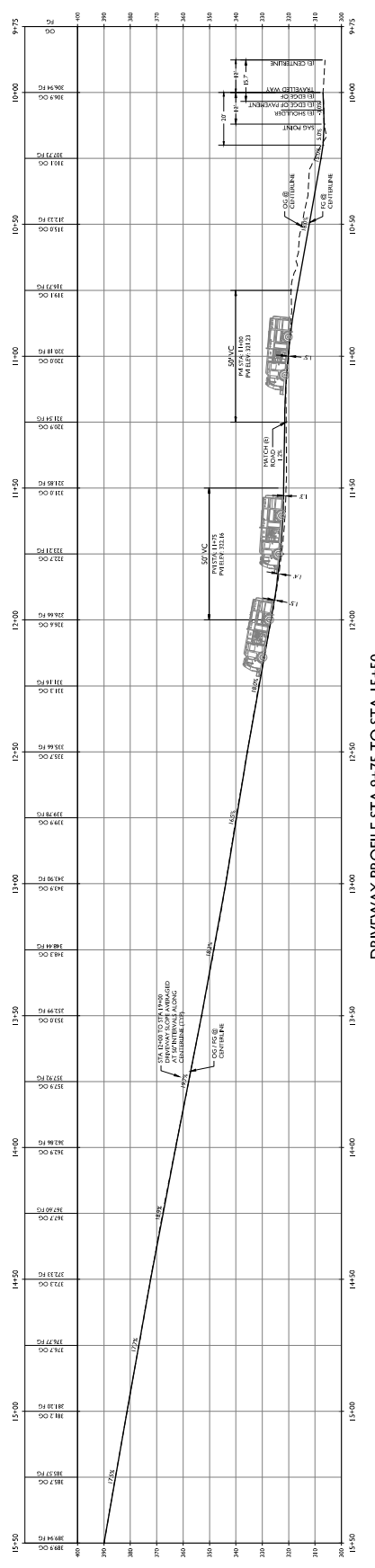


APN 022-080-028  
 LANDS OF AS VINEYARDS, LLC  
**WINERY GRADING AND LAYOUT PLAN**  
 SCALE 1" = 20'

FOR NUMBER:	14102
TITLE:	RECONSTRUCTION DWG
ORIGINAL SIZE:	24" X 36"
SHEET NUMBER:	
DATE:	MAY 8, 2020
DESIGNED BY:	ASST. CIVIL ENGINEER
CHECKED BY:	18M1
DATE:	MAY 8, 2020
REVISIONS:	
BY:	
DATE:	
DESCRIPTION:	



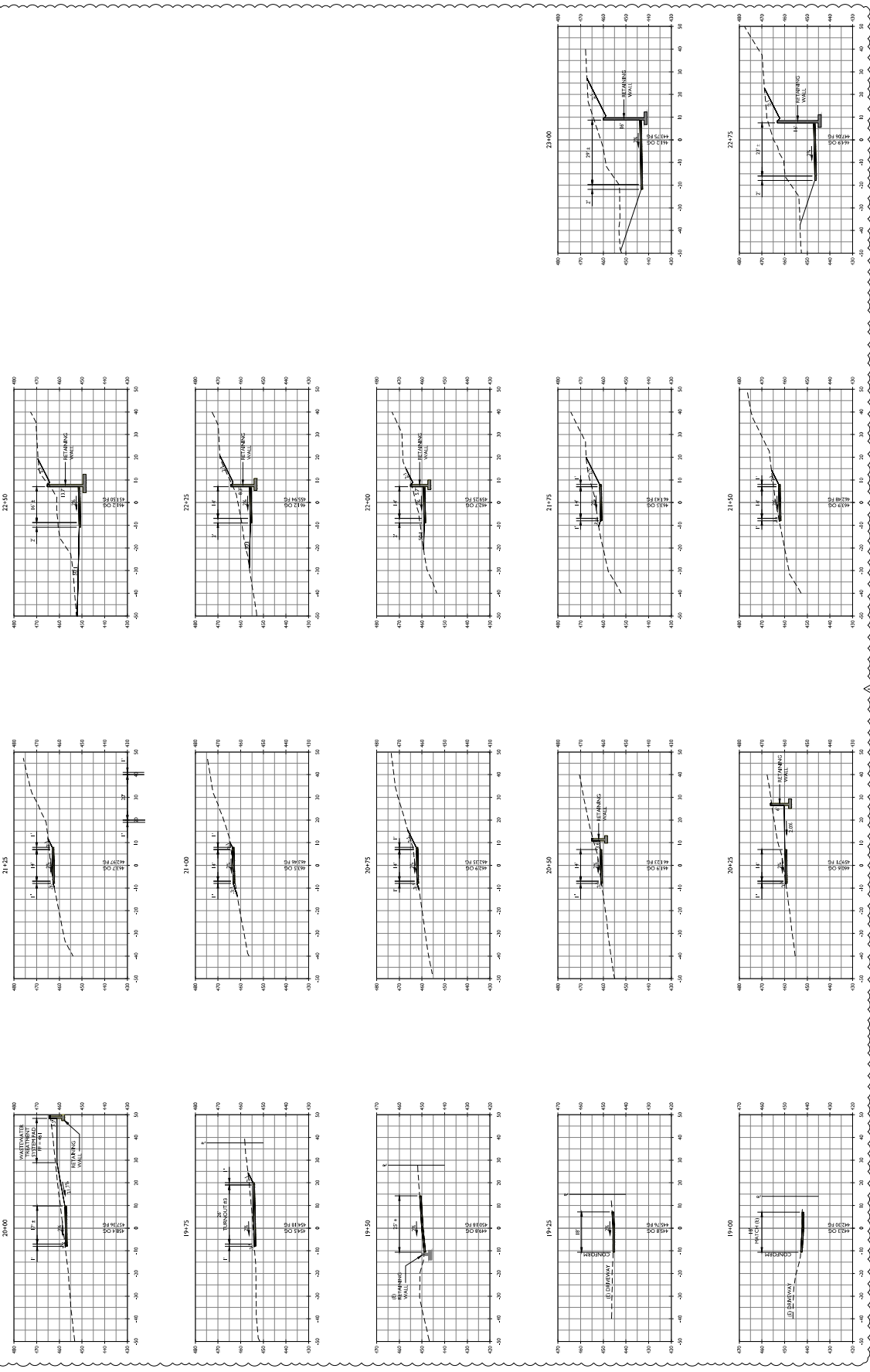
PREPARED UNDER THE DIRECTION OF:  
**SODHANI WINERY**  
 USE PERMIT MODIFICATION CONCEPTUAL SITE IMPROVEMENT PLANS  
 DRIVEWAY PROFILES STA 9+75 TO STA 24+50 & STA 100+00 TO 101+50



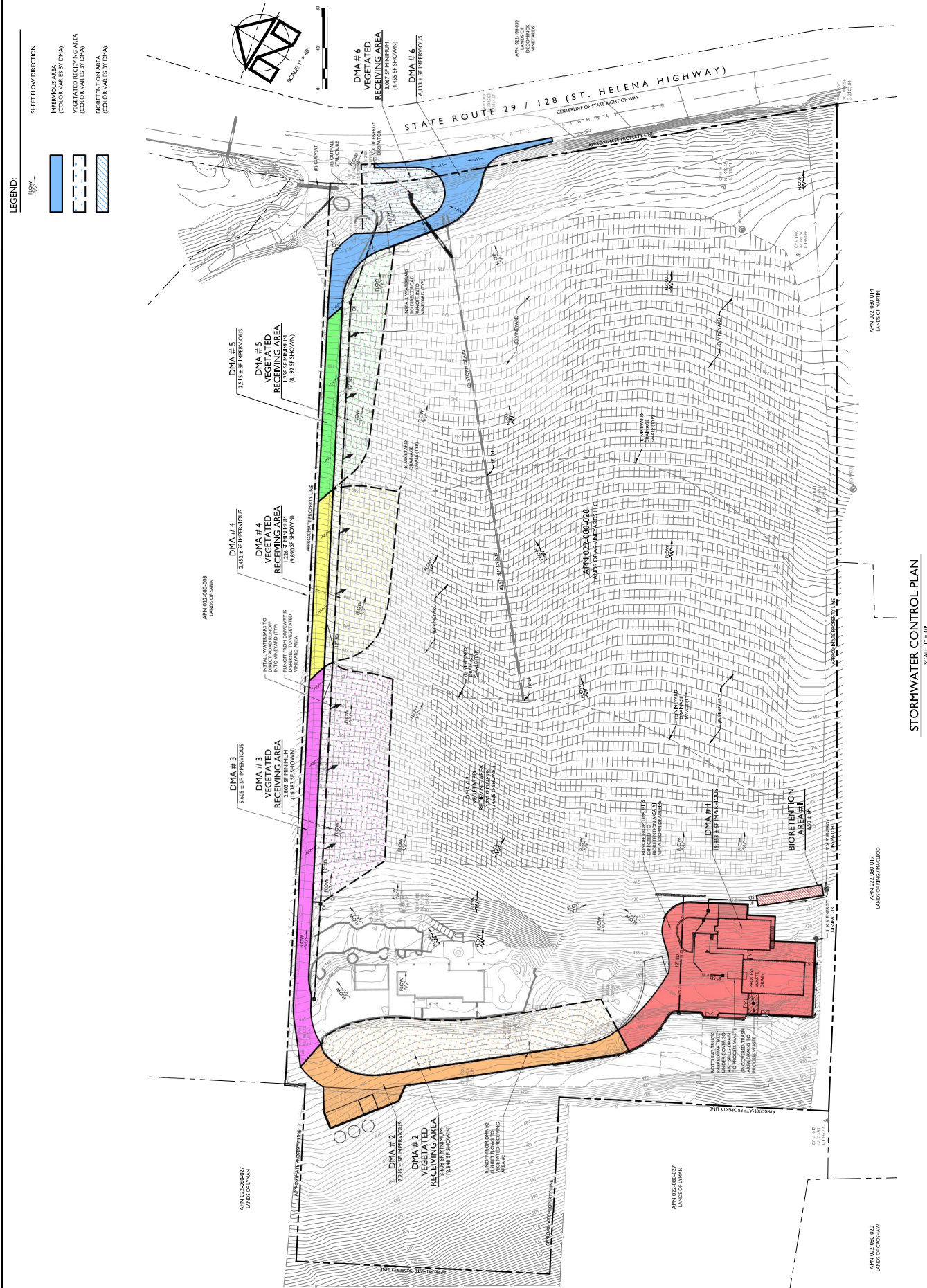
PREPARED UNDER THE  
 DIRECTION OF:



DRAWN BY:	CCAD
CHECKED BY:	HRM
DATE:	MAY 8, 2020
REVISIONS:	AS SHOWN 1. PERMIT REVIEW 2. PERMIT REVIEW 3. PERMIT REVIEW
PROJECT:	PERMIT MODIFICATION CONCEPTUAL SITE IMPROVEMENT PLANS
SHEET NUMBER:	C5
PROJECT NUMBER:	14102
FILE NAME:	14102CONCEPT.DWG
ORIGINAL SIZE:	24" X 36"
SHEET NUMBER:	



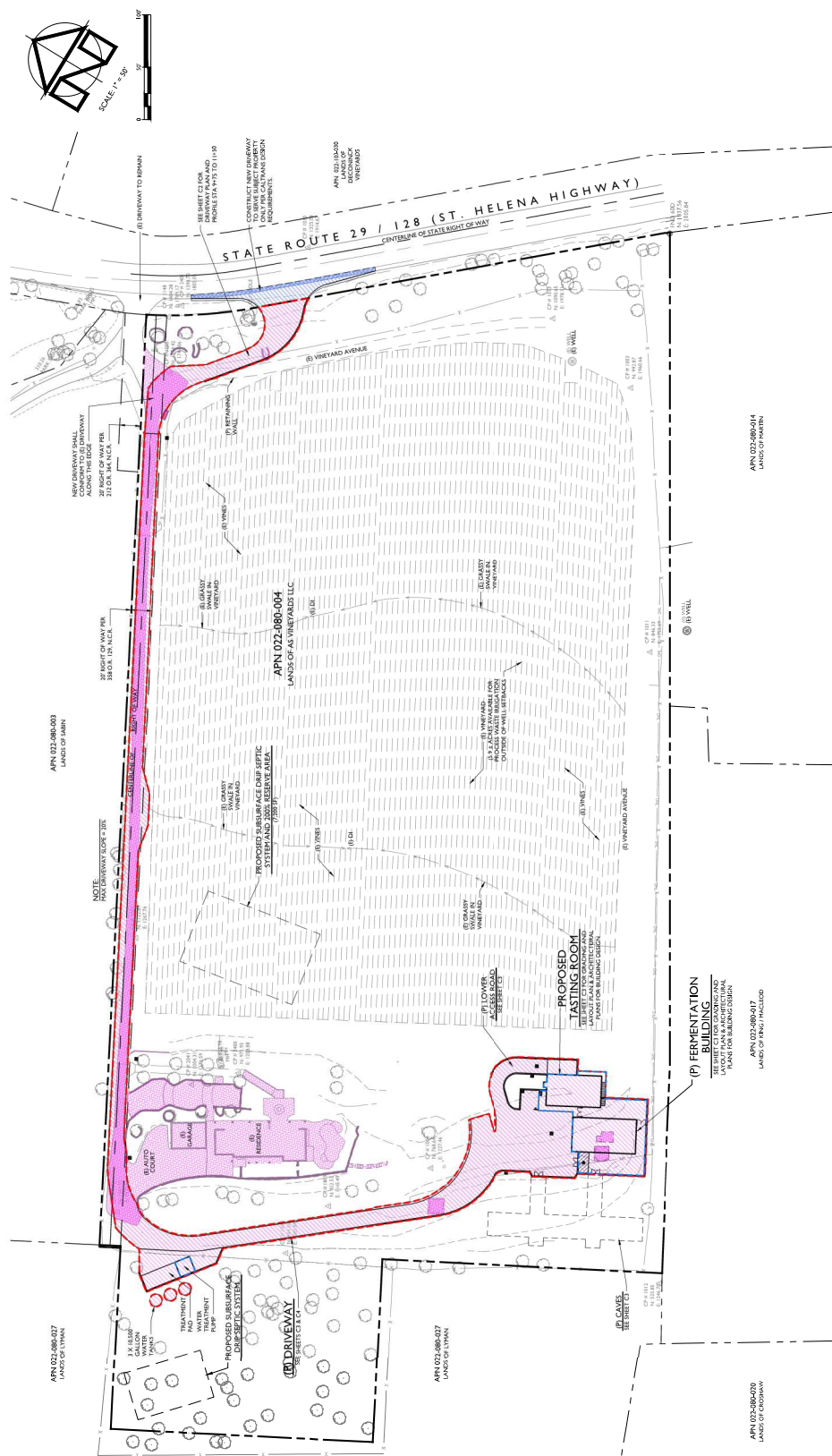
DRIVEWAY CROSS SECTIONS  
 STA 19+00 TO STA 23+00  
 SCALE: 1" = 20'



STORMWATER CONTROL PLAN  
 SCALE: 1" = 40'



SODHANI WINERY



**IMPERVIOUS SURFACE SUMMARY**

PROJECT	NEW AREA	RECONSTRUCTED	TOTAL NEW AND RECONSTRUCTED AREA (SQ FT)
TOTAL AREA	10,500	1,500	12,000
PERVIOUS SURFACE	2,000	1,000	3,000
IMPERVIOUS SURFACE	8,500	500	9,000

RECONSTRUCTED AREAS IN AN EXISTING IMPERVIOUS SURFACES THAT ARE BEING RE-PAVED WITH NEW AND ARE NOT BEING REPAVED WITH NEW IMPERVIOUS SURFACE.

WATER CONTOUR AREA

WATER DEVELOPMENT AREA

IMPERVIOUS SURFACE EXHIBIT  
SCALE: 1" = 50'

### APPENDIX 3: Water Storage Tank Water Balance Calculations

## Irrigation Storage Tank Water Balance

Month	Beginning Balance	Process Wastewater	Land Application Capacity	Ending Balance
January	0	6,000	128,159	0
February	0	6,000	128,159	0
March	0	6,000	128,159	0
April	0	4,800	128,159	0
May	0	4,800	71,104	0
June	0	6,000	177,761	0
July	0	12,000	177,761	0
August	0	15,600	234,816	0
September	0	30,000	234,816	0
October	0	15,600	199,264	0
November	0	7,200	128,159	0
December	0	6,000	128,159	0
		120,000	1,864,478	

Notes:

1. All values shown above for beginning balance, inflow, outflow and ending balance are in units of gallons.
2. See attached tables for detailed explanation of process wastewater and irrigation data presented in this table.
3. This water balance is based on the assumption that the tank is empty in August, just prior to crush.
4. Where irrigation demand exceeds available treated wastewater availability additional irrigation water will be provided by another source.



## Winery Process Wastewater Generation Analysis

Annual Wine Production	20,000 gallons
Wastewater Generation Rate	6 gallons per gallon of wine
Annual Wastewater Generation	120,000 gallons
Crush Season Length	30 days
Wastewater Generated During Crush	1.5 gallons per gallon of wine
Peak Wastewater Generation Rate	1,000 gallons per day

Winery Process Wastewater Generation Table			
Month	Percentage of Annual Total	Monthly Flow (gallons)	Average Flow (gpd)
January	5.0%	6,000	194
February	5.0%	6,000	214
March	5.0%	6,000	194
April	4.0%	4,800	160
May	4.0%	4,800	155
June	5.0%	6,000	200
July	10.0%	12,000	387
August	13.0%	15,600	503
September	25.0%	30,000	1,000
October	13.0%	15,600	503
November	6.0%	7,200	240
December	5.0%	6,000	194
<b>Total</b>	<b>100.0%</b>	<b>120,000</b>	

**Notes:**

- I. Wastewater generation rates and monthly proportioning are based on our past experience with similar projects.

## Irrigation Schedule Analysis

### Vineyard Information:

Total acres of vines	5.9 acres
Vine Row Spacing	5 feet
Vine Spacing	3 feet
Vine density	2,904 vines per acre (average)
Total Vine Count	17,134 vines

### Irrigation Information:

Seasonal Irrigation<sup>1</sup> 41.5 gallons per vine (May through October)

Non-Irrigation Application 0.8 inches October through April

Irrigation Schedule					
Month	Monthly Percentage <sup>2</sup>	Irrigation per Vine (gallons)	Irrigation (gallons)	Non-Seasonal Irrigation Application (gallons)	Total (gallons)
January		0.0	0	128,159	128,159
February		0.0	0	128,159	128,159
March		0.0	0	128,159	128,159
April		0.0	0	128,159	128,159
May	10%	4.2	71,104	0	71,104
June	25%	10.4	177,761	0	177,761
July	25%	10.4	177,761	0	177,761
August	15%	6.2	106,657	128,159	234,816
September	15%	6.2	106,657	128,159	234,816
October	10%	4.2	71,104	128,159	199,264
November		0.0	0	128,159	128,159
December		0.0	0	128,159	128,159
Total	100%	41.5	711,044	1,153,434	1,864,478

### Notes:

1. Irrigation per vine is based on 0.37 acre-feet per acre of vines per Vineyard Manager.
2. Monthly vineyard irrigation percentages are based on our past experience with projects of this type.
3. Non-Irrigation Application is for managing tank levels and assumes a maximum of 5 operational days per month based on historic weather data (Summit Engineering NBRID Capacity Study, 1996) and a saturated soil infiltration rate of 0.1 gallons per square foot per day uniformly over the entire area.

## APPENDIX 4: Site Evaluation Reports

NAPA COUNTY DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
REQUEST FOR SITE EVALUATION INSPECTION

02-39

92-14448

ENVIRONMENTAL HEALTH DEPT. USE ONLY

FEE: \$348.00  
DATE: 10/29/02  
RECEIPT: 24857  
BY: Cg

PARCEL NUMBER: 22-080-04  
JOB ADDRESS: 3283 St Hel Hwy  
OWNER: Sasha ~~Steen~~ ~~Steen~~ Handy Steen  
TEST CONDUCTED BY: Bartelt

TYPE OF TEST: FIELD ANALYSIS  
To be run on 11/12/02 at 10:00 am/pm  
W/CA11

PERCOLATION TEST  
To be run on \_\_\_\_\_ from \_\_\_\_\_ am/pm to \_\_\_\_\_ pm

PURPOSE OF TEST: HOUSE: X WINERY: X OTHER: \_\_\_\_\_

PROJECTED WASTEWATER FLOWS: maybe 1050 gpd

\*\*\*\*\*

PERCOLATION TEST INSPECTION RESULTS

Pre-soak checked? yes  no \_\_\_\_\_ Length of pre-soak: \_\_\_\_\_

Checked by: \_\_\_\_\_ Date: \_\_\_\_\_

Rate at time of inspection: \_\_\_\_\_ Stabilized perc rate: \_\_\_\_\_

Gravel and Pipe Used? yes \_\_\_\_\_ no \_\_\_\_\_ If so, take the perc rate \_\_\_\_\_ x .6 = \_\_\_\_\_ in/hr

\*\*\*\*\*

TYPE OF SYSTEM APPROVED

STANDARD SYSTEM

Acceptable soil to: 72" / Assigned perc range: 1-3 / 3-6 <sup>to 30"</sup> / 6-12

Depth of trenches: \_\_\_\_\_ / Rock under pipe: \_\_\_\_\_ / Cover over rock: \_\_\_\_\_

Lineal feet of leachline required: Depends upon project / Plot plan received: \_\_\_\_\_

Slope: ~10% / Surface drainage problems: none noted

Additional information: \_\_\_\_\_

SPECIAL DESIGN SYSTEM DUE TO THE FOLLOWING - Size constraints: \_\_\_\_\_

Perc rate too slow: \_\_\_\_\_ / Perc rate too fast: \_\_\_\_\_ / Steep slope: \_\_\_\_\_

Insufficient soil depth: \_\_\_\_\_ / High seasonal groundwater: \_\_\_\_\_

Acceptable soil for special design: \_\_\_\_\_ / Other problems: \_\_\_\_\_

E.H. Specialist Kim Withrow Date 4-10-03

**FIELD ANALYSIS**

**TEXTURE ( In the proposed trench zone )**

Core Hole	CLAY CONTENT						Core Hole	SAND CONTENT						Core Hole	GRAVEL, COBBLE, STONE CONTENT					
	1	2	3	4	5	6		1	2	3	4	5	6		1	2	3	4	5	6
Low (<12)							High (>50)							Very High (>60)						
Mod (12-27)							Mod (20-50)	X	X	X	X	X	High(35-60)							
High (27-40)	X	X	X	X	X		Low (<20)	X	X	X	X	X	Mod (15-35)							
High (>40)													Low (<15)	X	X	X	X	X		

**STRUCTURE**

**SOIL DENSITY WHEN PICKED (Circle whether <sup>moist</sup> wet or <sup>dry</sup> dry)**

Core Hole	1	2	3	4	5	6
pick sluffs or caves soil in						
pick bites and soil sluffs	X	X	X	X	X	
pick bites/ little or no soil sluffs						

**CONSISTENCE (Circle <sup>moist</sup> w or <sup>dry</sup> d)**

Core Hole	1	2	3	4	5	6
Easy	X	X	X	X	X	
Moderate						
Hard						

**STRUCTURE - good**

Core Hole	1	2	3	4	5	6
Granular						
Blocky	X	X	X	X	X	
Prism						
Platy						
Massive						
Cemented						

**MODIFIER CHARACTERISTICS**

- Soil Survey Name: \_\_\_\_\_
- Horizon Boundaries: Diffuse \_\_\_\_\_ Gradual X Abrupt \_\_\_\_\_
- Topography: Concave \_\_\_\_\_ Convex X / Aspect: \_\_\_\_\_
- Vegetation: Type Vineyard Condition: good

**CORE HOLE RECORD**

HOLE #1	EST. PERC	HOLE #2	EST. PERC	HOLE #3	EST. PERC
0 to 20" loam → clay	3-6	0 to 30" loam → clay	3-6	_____	_____
30" to 38" clay loam	1-3	30" to 42" clay loam	1-3	_____	_____
38" to 78" tighter clay loam	1-3	42" to 72" tighter clay loam	1-3	_____	_____
Roots: <u>few fine to 60"</u>		Roots: _____		Roots: _____	
Color: <u>bright</u> / dull		Color: <u>bright</u> / dull		Color: <u>bright</u> / dull	
Water Table: <u>not noted</u>		Water Table: <u>not noted</u>		Water Table: <u>not noted</u>	
Dug: <u>easy</u> / hard / dusty / smear		Dug: <u>easy</u> / hard / dusty / smear		Dug: <u>easy</u> / hard / dusty / smear	
Acceptable Soil To: <u>78"</u>		Acceptable Soil To: <u>72"</u>		Acceptable Soil To: <u>72"</u>	

**CORE HOLE RECORD**

HOLE #4	EST. PERC	HOLE #5	EST. PERC	HOLE #6	EST. PERC
0 to 52" loam → clay loam	3-6	_____	_____	0 to 36"	1-3
52" to 72" clay loam	1-3	_____	_____	36" to 72" clay loam	1-3
Roots: _____		Roots: _____		Roots: _____	
Color: <u>bright</u> / dull		Color: <u>bright</u> / dull		Color: <u>bright</u> / dull	
Water Table: <u>not noted</u>		Water Table: <u>not noted</u>		Water Table: _____	
Dug: <u>easy</u> / hard / dusty / smear		Dug: <u>easy</u> / hard / dusty / smear		Dug: <u>easy</u> / hard / dusty / smear	
Acceptable Soil To: <u>72"</u>		Acceptable Soil To: <u>72"</u>		Acceptable Soil To: _____	

708 0-40" clay loam/loam 1-3  
40"-72" loam clay loam 1-3


Please attach an 8.5" x 11" plot map showing the locations of all test pits triangulated from permanent landmarks or known property corners. The map must be drawn to scale and include a North arrow, surrounding geographic and topographic features, direction and % slope, distance to drainages, water bodies, potential areas for flooding, unstable landforms, existing or proposed roads, structures, utilities, domestic water supplies, wells, ponds, existing wastewater treatment systems and facilities.

Permit #: OE16-0002
APN: 022-080-004
(County Use Only) Reviewed by: _____ Date: _____

**PLEASE PRINT OR TYPE ALL INFORMATION**

Property Owner AS Vineyards LLC	X New Construction <input type="checkbox"/> Addition <input type="checkbox"/> Remodel <input type="checkbox"/> Relocation <input type="checkbox"/> Other:
Property Owner Mailing Address 85 21 <sup>st</sup> Avenue	X Residential - # of Bedrooms: 2                      Design Flow : 240                      gpd
City                                      State                                      Zip San Francisco                      CA                                      94121	X Commercial – Type: Winery
Site Address/Location 3283 St. Helena Highway North St. Helena, CA 94574	Sanitary Waste: 60                      gpd                      Process Waste: 600                      gpd <input type="checkbox"/> Other: Sanitary Waste:                      gpd                      Process Waste:                      gpd

**Evaluation Conducted By:**

Company Name Applied Civil Engineering Incorporated	Evaluator's Name Michael R. Muelrath, R.C.E. 67435	Signature (Civil Engineer, R.E.H.S., Geologist, Soil Scientist) <i>Michael R. Muelrath</i>
Mailing Address: 2074 West Lincoln Avenue	Telephone Number (707) 320-4968	
City                                      State                                      Zip Napa                                      CA                                      94558	Date Evaluation Conducted December 6, 2016	

<u>Primary Area</u>	<u>Expansion Area</u>
Acceptable Soil Depth: 72" to 80"                      TP#1A – TP#5A	Acceptable Soil Depth: 72" to 80"                      TP#1A – TP#5A
Soil Application Rate (gal. /sq. ft. /day): 0.6	Soil Application Rate (gal. /sq. ft. /day): 0.6
System Type(s) Recommended: Pretreatment and Subsurface Drip	System Type(s) Recommended: Pretreatment and Subsurface Drip
Slope: 15% to 30%                      Distance to nearest water source: 100'+	Slope: 15% to 30%                      Distance to nearest water source: 100'+
Hydrometer test performed?                      No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> (attach results)	Hydrometer test performed?                      No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> (attach results)
Bulk Density test performed?                      No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)	Bulk Density test performed?                      No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)
Percolation test performed?                      No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)	Percolation test performed?                      No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)
Groundwater Monitoring Performed?    No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)	Groundwater Monitoring Performed?    No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)

**Site constraints/Recommendations:**  
This site evaluation was performed to find an area suitable to install a new septic system to serve a recently permitted winery and the existing residence. The feasibility study for the winery identified an area within the vineyard to accommodate the septic system and this evaluation was performed to locate soil outside of the vineyard for the new septic system. Final layout to be verified after winery site design is completed.

The main constraints are the property line setbacks, well setbacks and limited space available between the proposed site improvements and the existing vineyard. The existing well will have to be destroyed if the area of Test Pits #1A and #2A is utilized.

Test Pit #1A

**PLEASE PRINT OR TYPE ALL INFORMATION**

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-36	G	0-15	CL	MSB	S	VFRB	SS	CF/FM	FF	NONE
36-80		0-15	CL	MSB	S	VFRB	SS	FF/FM	FF	NONE

Acceptable soil depth = 80"

Test Pit #2A

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-72		0-15	CL	MSB	S	VFRB	SS	CF/FM	FF	NONE

Acceptable soil depth = 72"

Test Pit #3A

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-72	G	0-15	CL	MSB	S	VFRB	SS	CF/FM	FF	NONE

Acceptable soil depth = 72"

Test Pit #4A

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-72		0-15	CL	MSB	S	VFRB	SS	CF/CM	CF/CM/FC	NONE

Acceptable soil depth = 72"

Test Pit #5A

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-72		0-15	CL	MSB	S	VFRB	SS	CF/CM	CF/CM/FC	NONE

Acceptable soil depth = 72"

LEGEND

Boundary	Texture	Structure	Consistence			Pores	Roots	Mottling
			Side Wall	Ped	Wet			
<b>A</b> =Abrupt <1" <b>C</b> =Clear 1"- 2.5" <b>G</b> =Gradual 2.5"-5" <b>D</b> =Difuse >5"	<b>S</b> =Sand <b>LS</b> =Loamy Sand <b>SL</b> =Sandy Loam <b>SCL</b> =Sandy Clay Loam <b>SC</b> =Sandy Clay <b>CL</b> =Clay Loam <b>L</b> =Loam <b>C</b> =Clay <b>SiC</b> =Silty Clay <b>SiCL</b> =Silty Clay Loam <b>SiL</b> =Silt Loam <b>Si</b> =Silt	<b>W</b> =Weak <b>M</b> =Moderate <b>S</b> =Strong <b>G</b> =Granular <b>PI</b> =Platy <b>Pr</b> =Prismatic <b>C</b> =Columnar <b>B</b> =Blocky <b>AB</b> =Angular Blocky <b>SB</b> =Subangular Blocky <b>M</b> =Massive <b>SG</b> =Single Grain <b>CEM</b> =Cemented	<b>L</b> =Loose <b>S</b> =Soft <b>SH</b> =Slightly Hard <b>H</b> =Hard <b>VH</b> =Very Hard <b>ExH</b> =Extremely Hard	<b>L</b> =Loose <b>VFRB</b> =Very Friable <b>FRB</b> =Friable <b>F</b> =Firm <b>VF</b> =Very Firm <b>ExF</b> =Extremely Firm	<b>NS</b> =NonSticky <b>SS</b> =Slightly Sticky <b>S</b> =Sticky <b>VS</b> =Very Sticky <b>NP</b> =NonPlastic <b>SP</b> =Slightly Plastic <b>P</b> =Plastic <b>VP</b> =Very Plastic	<u>Quantity:</u> <b>F</b> =Few <b>C</b> =Common <b>M</b> =Many <u>Size:</u> <b>VF</b> =Very Fine <b>F</b> =Fine <b>M</b> =Medium <b>C</b> =Coarse <b>VC</b> =Very Coarse	<u>Quantity:</u> <b>F</b> =Few <b>C</b> =Common <b>M</b> =Many <u>Size:</u> <b>F</b> =Fine <b>M</b> =Medium <b>C</b> =Coarse <b>VC</b> =Very Coarse <b>ExC</b> =Extremely Coarse	<u>Quantity:</u> <b>F</b> =Few <b>C</b> =Common <b>M</b> =Many <u>Size:</u> <b>F</b> =Fine <b>M</b> =Medium <b>C</b> =Coarse <u>Contrast:</u> <b>Ft</b> =Faint <b>D</b> =Distinct <b>P</b> =Prominent

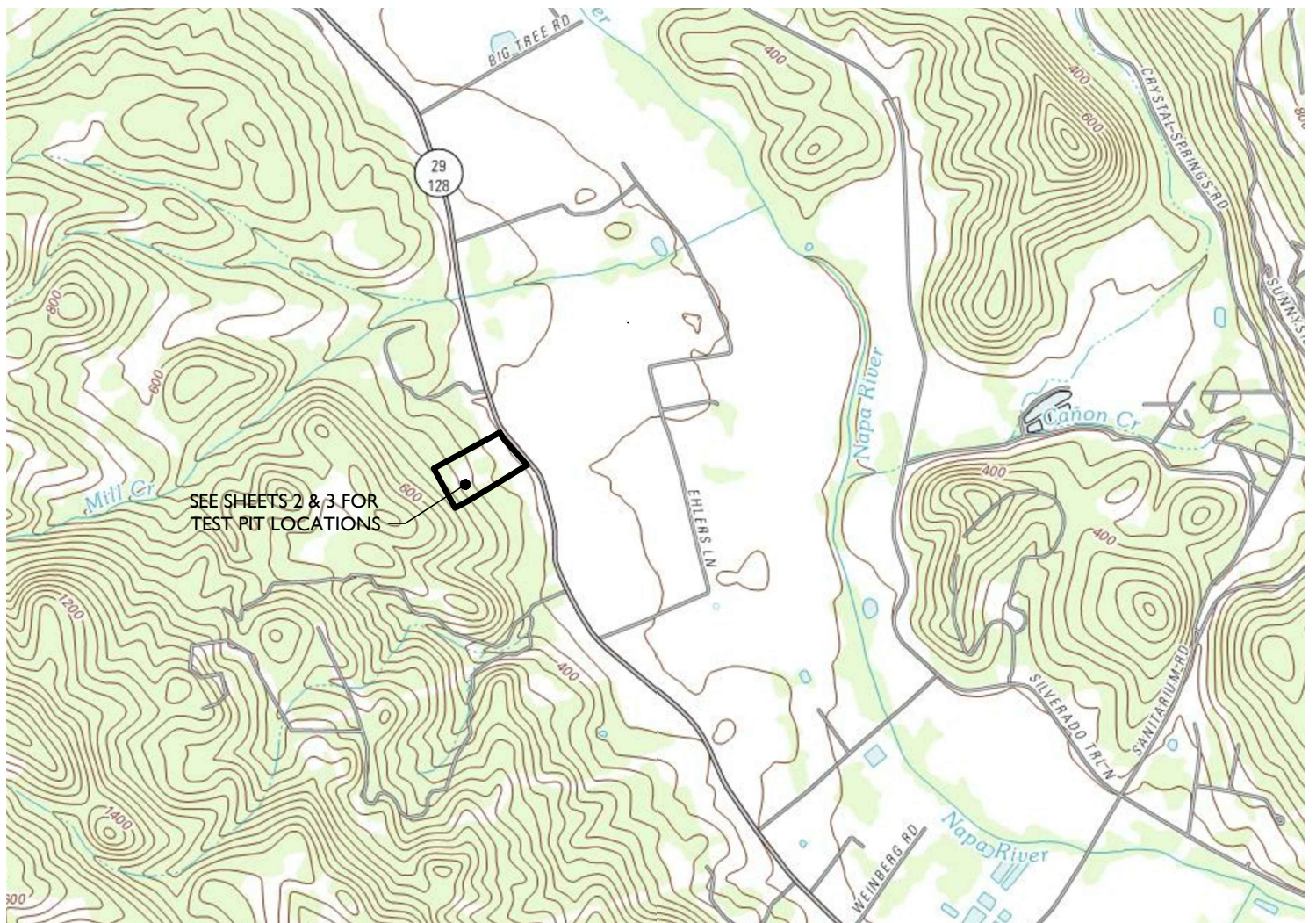
Notes:

Structure is recorded as Modifier then Structure - for example, Moderate (M) Subangular Blocky (SB) is recorded as MSB

Pores and Roots are recorded as Quantity then Size – for example Few (F) Coarse (C) is recorded as FC

Mottling is recorded as Quantity then Size then Contrast – for example Few (F) Coarse (C) Distinct (D) is recorded as FCD



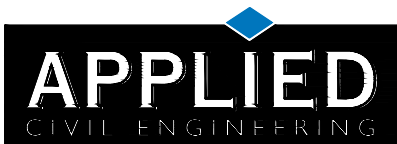


## LOCATION MAP

SCALE: 1" = 2,000'

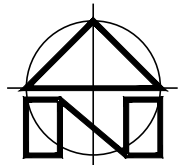
### NOTES:

1. TEST PITS 1A THROUGH 5A (TP #1A - TP #5A) WERE EXCAVATED BY McCOLLUM GENERAL ENGINEERING AND WERE WITNESSED BY MIKE MUELRATH OF APPLIED CIVIL ENGINEERING INCORPORATED AND DARELL CHOATE OF THE NAPA COUNTY PLANNING, BUILDING AND ENVIRONMENTAL SERVICES DEPARTMENT - ENVIRONMENTAL HEALTH DIVISION ON DECEMBER 6, 2016.
2. FADED BACKGROUND REPRESENTS EXISTING TOPOGRAPHIC FEATURES. TOPOGRAPHIC INFORMATION WAS OBTAINED FROM THE "MAP OF TOPOGRAPHY OF A PORTION OF THE LANDS OF 3283 ST. HELENA HIGHWAY" PREPARED BY ALBION SURVEYS, INC., DATED JUNE 30, 2014. APPLIED CIVIL ENGINEERING INCORPORATED ASSUMES NO LIABILITY REGARDING THE ACCURACY OR COMPLETENESS OF THE TOPOGRAPHIC INFORMATION.
3. CONTOUR INTERVAL: ONE (1) FOOT, HIGHLIGHTED EVERY FIVE (5) FEET
4. BENCHMARK: NAPA COUNTY BENCHMARK NO. 505-U, ELEVATION = 349.19'
5. AERIAL PHOTOGRAPHS WERE OBTAINED FROM THE NAPA COUNTY GEOGRAPHIC INFORMATION SYSTEM (GIS) DATABASE AND ARE DATED APRIL 9, 2011.
6. ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) MAP NUMBER 06055C0245E, EFFECTIVE SEPTEMBER 26, 2008, THE PROJECT SITE IS NOT LOCATED IN A SPECIAL FLOOD HAZARD AREA.



2074 West Lincoln Avenue  
 Napa, CA 94558  
 (707) 320-4968 (707) 320-2395 Fax  
 www.appliedcivil.com

**AS VINEYARDS LLC**  
 3283 ST. HELENA HIGHWAY NORTH  
 ST. HELENA, CA 94574  
 APN 022-080-004



SCALE: 1" = 2,000'

APN 022-080-016  
LANDS OF LYMAN

APPROXIMATE PROPERTY LINE

(E) WELL

(E) RESIDENCE

100' SETBACK

APN 022-080-017  
LANDS OF KING / MACLEOD

SEE SHEET 3 FOR  
TEST PIT MAP

APN 022-080-003  
LANDS OF SABIN

APN 022-080-004  
LANDS OF AS VINEYARDS LLC

(E) WELL

(E) WELL

100' SETBACK

APN 022-080-014  
LANDS OF MARTIN

(E) WELL

(E) WELL

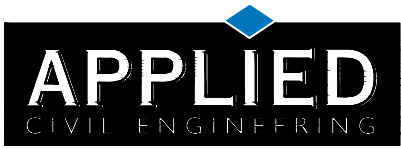
100' SETBACK

STATE ROUTE 29 / 128  
(ST. HELENA HIGHWAY)

APN 022-100-030  
LANDS OF DECONINCK VINEYARDS

### LOCATION MAP

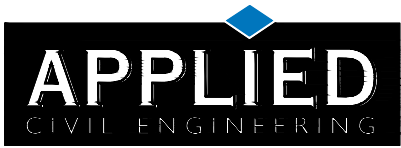
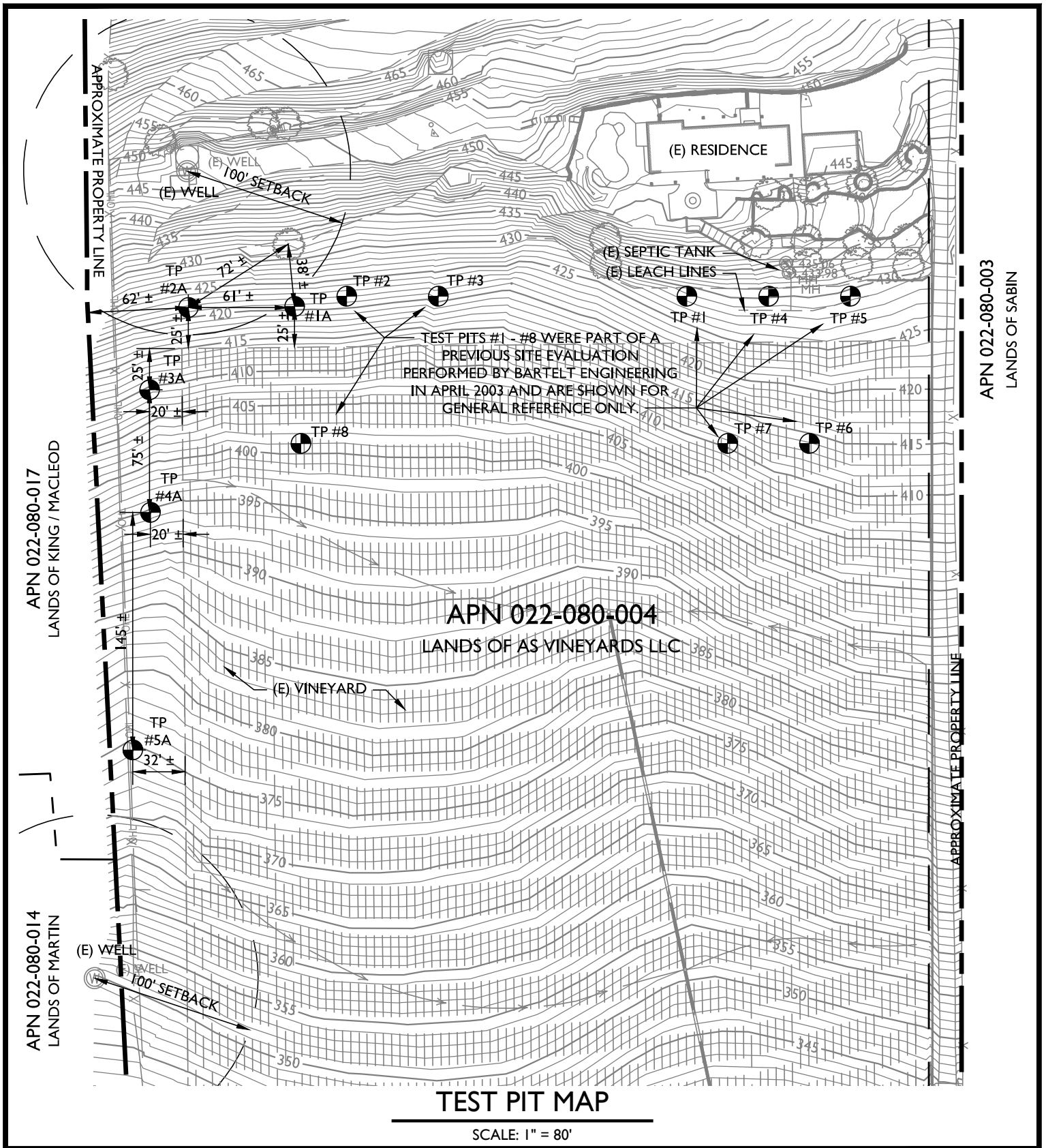
SCALE: 1" = 150'



INCORPORATED  
2074 West Lincoln Avenue  
Napa, CA 94558  
(707) 320-4968 (707) 320-2395 Fax  
www.appliedcivil.com

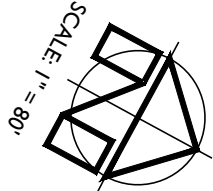
AS VINEYARDS LLC  
3283 ST. HELENA HIGHWAY NORTH  
ST. HELENA, CA 94574  
APN 022-080-004





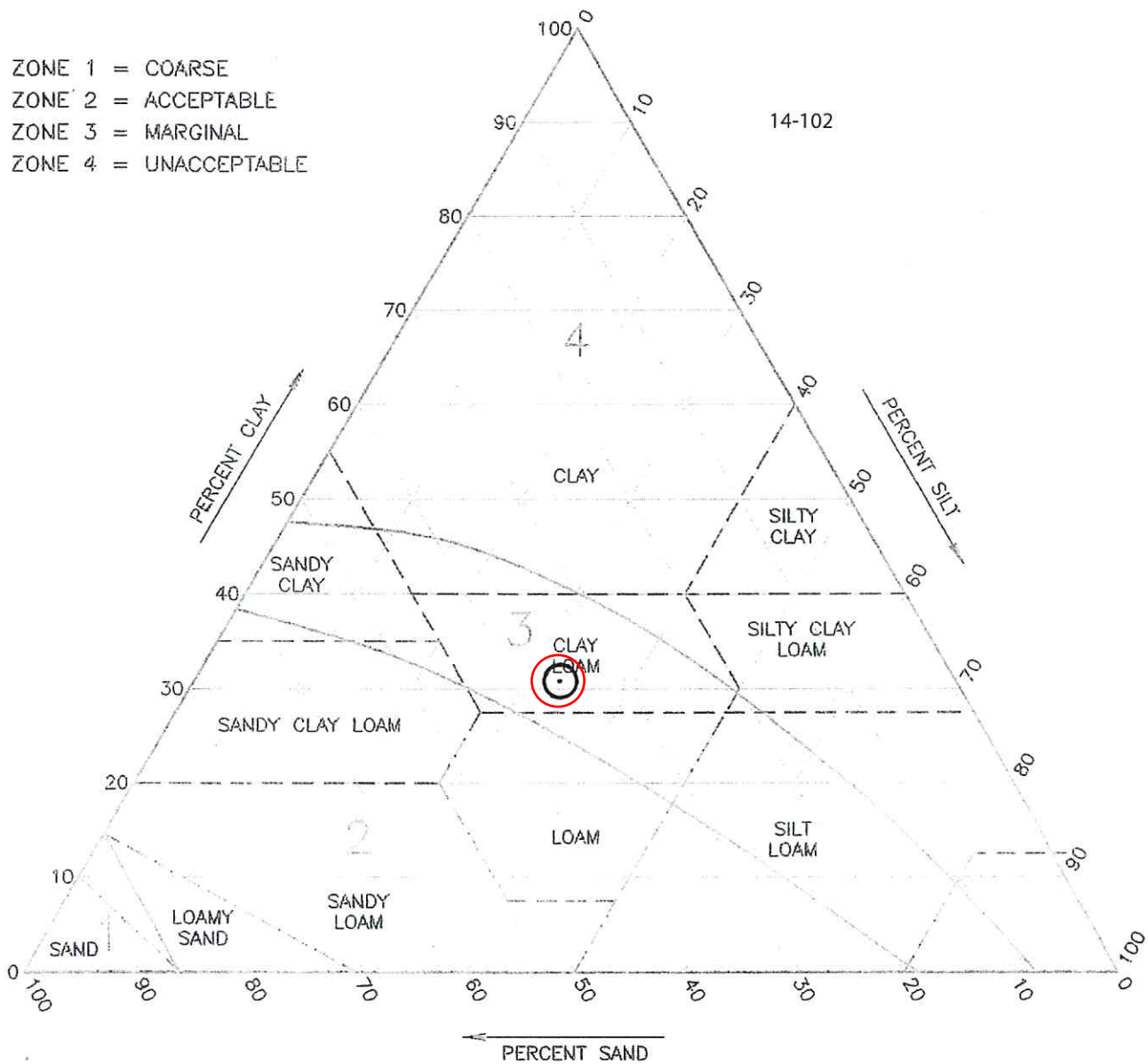
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3283 ST. HELENA HIGHWAY NORTH  
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APN 022-080-004



# SOIL PERCOLATION SUITABILITY CHART

- 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.

## Note:

For soils falling in sand, loamy sand or sandy loam classification bulk density analysis will generally not affect suitability and analysis not necessary.

Please attach an 8.5" x 11" plot map showing the locations of all test pits triangulated from permanent landmarks or known property corners. The map must be drawn to scale and include a North arrow, surrounding geographic and topographic features, direction and % slope, distance to drainages, water bodies, potential areas for flooding, unstable landforms, existing or proposed roads, structures, utilities, domestic water supplies, wells, ponds, existing wastewater treatment systems and facilities.

Permit #: OE16-00003

APN: 022-080-016

(County Use Only)  
Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

**PLEASE PRINT OR TYPE ALL INFORMATION**

Property Owner Dorothea Lyman	X New Construction <input type="checkbox"/> Addition <input type="checkbox"/> Remodel <input type="checkbox"/> Relocation <input type="checkbox"/> Other:
Property Owner Mailing Address 1088 Candlewood Avenue	X Residential - # of Bedrooms: 2      Design Flow : 240      gpd
City Sunnyvale      State CA      Zip 94089	X Commercial – Type: Winery Sanitary Waste: 60      gpd      Process Waste: 600      gpd
Site Address/Location No Site Address St. Helena Highway North St. Helena, CA 94574	<input type="checkbox"/> Other: Sanitary Waste:      gpd      Process Waste:      gpd

**Evaluation Conducted By:**

Company Name Applied Civil Engineering Incorporated	Evaluator's Name Michael R. Muelrath, R.C.E. 67435	Signature (Civil Engineer, R.E.H.S., Geologist, Soil Scientist) <i>Michael R. Muelrath</i>
Mailing Address: 2074 West Lincoln Avenue	Telephone Number (707) 820-4968	Exp. 12/31/2020
City Napa      State CA      Zip 94558	Date Evaluation Conducted December 6, 2016	



<b>Primary Area</b>	<b>Expansion Area</b>
Acceptable Soil Depth: 60" to 72"      TP#1 – TP#7	Acceptable Soil Depth: 60" to 72"      TP#1 – TP#7
Soil Application Rate (gal. /sq. ft. /day): 0.8	Soil Application Rate (gal. /sq. ft. /day): 0.8
System Type(s) Recommended: Pretreatment and Subsurface Drip	System Type(s) Recommended: Pretreatment and Subsurface Drip
Slope: 15% to 30%      Distance to nearest water source: 100'+	Slope: 15% to 30%      Distance to nearest water source: 100'+
Hydrometer test performed?      No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> (attach results)	Hydrometer test performed?      No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> (attach results)
Bulk Density test performed?      No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)	Bulk Density test performed?      No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)
Percolation test performed?      No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)	Percolation test performed?      No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)
Groundwater Monitoring Performed?      No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)	Groundwater Monitoring Performed?      No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (attach results)

**Site constraints/Recommendations:**  
 This site evaluation was performed to determine if it is feasible to install a new septic system to serve a recently permitted winery and the existing residence on the adjacent property (APN 022-080-004). This area would be acquired by the adjacent property owner either via a lot line adjustment or easement. Final layout to be verified after ground topographic mapping is obtained.

A sample was taken for laboratory analysis from Test Pit #2. The results for texture are sandy loam. Since it is very close to the border we recommend a more conservative texture of Loam for the determination of application rate and thus have indicated loam in the report below.

The main constraints are the property line setbacks and numerous trees.

Other types of systems could be suitable depending on actual design flows and topographic mapping.

Test Pit #1

**PLEASE PRINT OR TYPE ALL INFORMATION**

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-72		30-<50	L	MSB	S	VFRB	SS	CF/CM	CF/CM/FC	NONE

Acceptable soil depth = 72"

Test Pit #2

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-72		30-<50	L	MSB	S	VFRB	SS	CF/CM	CF/CM/FC	NONE

Acceptable soil depth = 72"

Test Pit #3

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-72		30-<50	L	MSB	S	VFRB	SS	CF/CM	CF/CM/FC	NONE

Acceptable soil depth = 72"

Test Pit #4

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-72		30-<50	L	MSB	S	VFRB	SS	CF/CM	CF/CM/FC	NONE

Acceptable soil depth = 72"

Test Pit #5

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-72		30-<50	L	MSB	S	VFRB	SS	CF/CM	CF/CM/FC	NONE

Acceptable soil depth = 72"

## Test Pit #6

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-60		30-<50	L	MSB	S	VFRB	SS	CF/CM	CF/CM/FC	NONE

Acceptable soil depth = 60"

## Test Pit #7

Horizon Depth (Inches)	Boundary	%Rock	Texture	Structure	Consistence			Pores	Roots	Mottling
					Side Wall	Ped	Wet			
0-72		30-<50	L	MSB	S	VFRB	SS	CF/CM	CF/CM/FC	NONE

Acceptable soil depth = 72"

## LEGEND

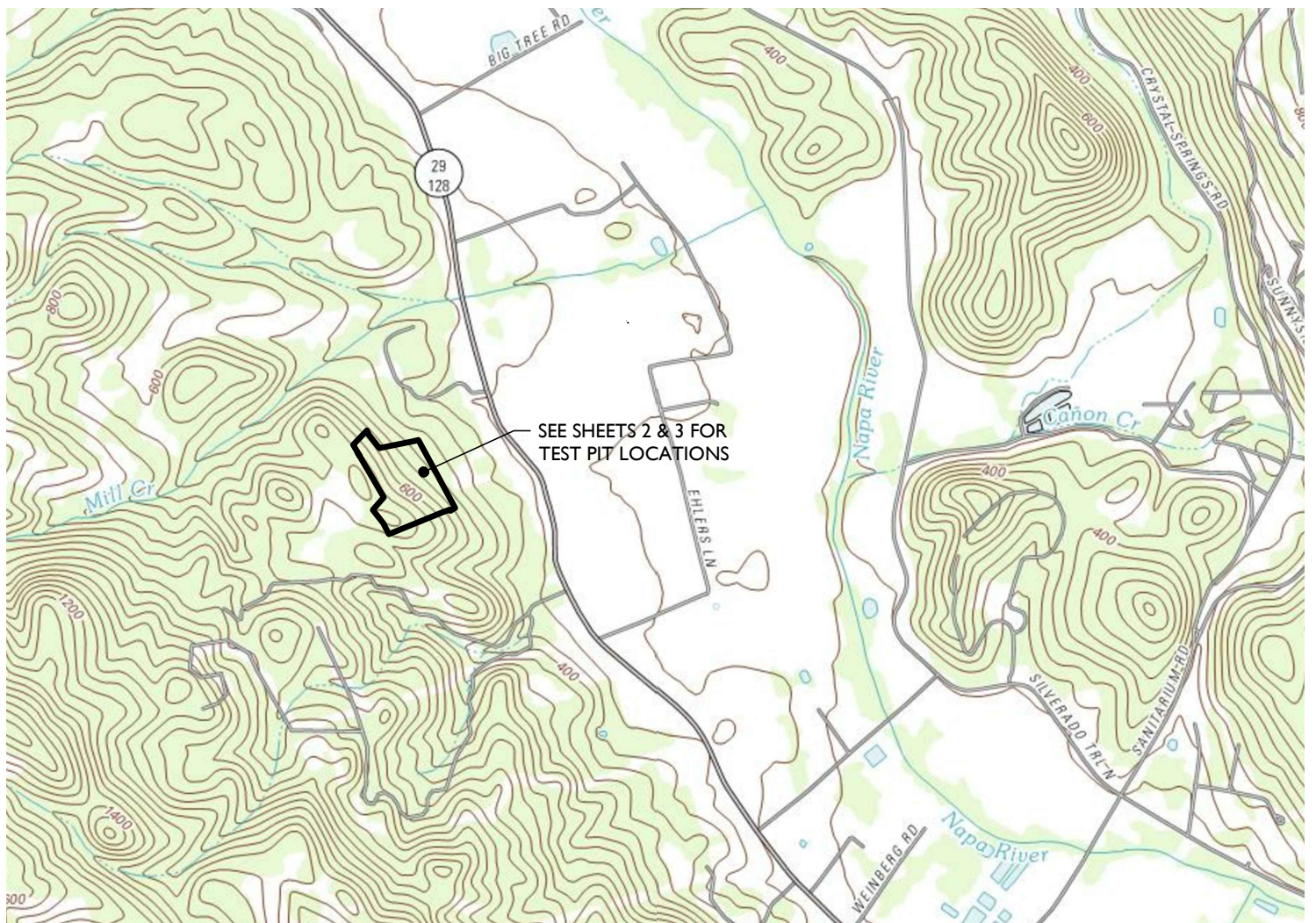
Boundary	Texture	Structure	Consistence			Pores	Roots	Mottling
			Side Wall	Ped	Wet	Quantity:	Quantity:	Quantity:
<b>A</b> =Abrupt <1"	<b>S</b> =Sand	<b>W</b> =Weak	<b>L</b> =Loose	<b>L</b> =Loose	<b>NS</b> =NonSticky	<b>F</b> =Few	<b>F</b> =Few	<b>F</b> =Few
<b>LS</b> =Loamy Sand	<b>M</b> =Moderate	<b>S</b> =Soft						
<b>C</b> =Clear 1"-2.5"	<b>SL</b> =Sandy Loam	<b>S</b> =Strong	<b>SH</b> =Slightly Hard	<b>FRB</b> =Friable	<b>S</b> =Sticky	<b>M</b> =Many	<b>M</b> =Many	<b>M</b> =Many
<b>G</b> =Gradual 2.5"-5"	<b>SCL</b> =Sandy Clay Loam	<b>G</b> =Granular	<b>H</b> =Hard	<b>F</b> =Firm	<b>VS</b> =Very Sticky	<b>Size:</b>	<b>Size:</b>	<b>Size:</b>
<b>D</b> =Difuse >5"	<b>SC</b> =Sandy Clay	<b>PI</b> =Platy	<b>VH</b> =Very Hard	<b>VF</b> =Very Firm	<b>NP</b> =NonPlastic	<b>VF</b> =Very Fine	<b>F</b> =Fine	<b>F</b> =Fine
	<b>CL</b> =Clay Loam	<b>Pr</b> =Prismatic	<b>ExH</b> =Extremely Hard	<b>ExF</b> =Extremely Firm	<b>SP</b> =Slightly Plastic	<b>F</b> =Fine	<b>M</b> =Medium	<b>M</b> =Medium
	<b>L</b> =Loam	<b>C</b> =Columnar			<b>P</b> =Plastic	<b>M</b> =Medium	<b>C</b> =Coarse	<b>C</b> =Coarse
	<b>C</b> =Clay	<b>B</b> =Blocky			<b>VP</b> =Very Plastic	<b>C</b> =Coarse	<b>VC</b> =Very Coarse	<b>VC</b> =Very Coarse
	<b>SiC</b> =Silty Clay	<b>AB</b> =Angular Blocky				<b>VC</b> =Very Coarse	<b>ExC</b> =Extremely Coarse	<b>ExC</b> =Extremely Coarse
	<b>SiCL</b> =Silty Clay Loam	<b>SB</b> =Subangular Blocky						
	<b>SiL</b> =Silt Loam	<b>M</b> =Massive						
	<b>Si</b> =Silt	<b>SG</b> =Single Grain						
		<b>CEM</b> =Cemented						

## Notes:

Structure is recorded as Modifier then Structure - for example, Moderate (M) Subangular Blocky (SB) is recorded as MSB

Pores and Roots are recorded as Quantity then Size - for example Few (F) Coarse (C) is recorded as FC

Mottling is recorded as Quantity then Size then Contrast - for example Few (F) Coarse (C) Distinct (D) is recorded as FCD

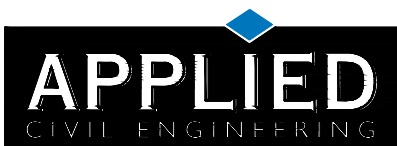


## LOCATION MAP

SCALE: 1" = 2,000'

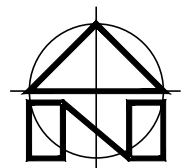
### NOTES:

1. TEST PITS ONE THROUGH SEVEN (TP #1 - TP #7) WERE EXCAVATED BY McCOLLUM GENERAL ENGINEERING AND WERE WITNESSED BY MIKE MUEL RATH OF APPLIED CIVIL ENGINEERING INCORPORATED AND DARELL CHOATE OF THE NAPA COUNTY PLANNING, BUILDING AND ENVIRONMENTAL SERVICES DEPARTMENT - ENVIRONMENTAL HEALTH DIVISION ON DECEMBER 6, 2016.
2. FADED BACKGROUND REPRESENTS EXISTING TOPOGRAPHIC FEATURES. TOPOGRAPHIC INFORMATION WAS TAKEN FROM THE NAPA COUNTY GEOGRAPHIC INFORMATION SYSTEM DATABASE. APPLIED CIVIL ENGINEERING INCORPORATED ASSUMES NO LIABILITY REGARDING THE ACCURACY OR COMPLETENESS OF THE TOPOGRAPHIC INFORMATION.
3. CONTOUR INTERVAL: FIVE (5) FOOT, HIGHLIGHTED EVERY TWENTY FIVE (25) FEET.
4. BENCHMARK: NAVD 29
5. AERIAL PHOTOGRAPHS WERE OBTAINED FROM THE NAPA COUNTY GEOGRAPHIC INFORMATION SYSTEM (GIS) DATABASE AND ARE DATED APRIL 9, 2011.
6. ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) MAP NUMBER 06055C0245E, EFFECTIVE SEPTEMBER 26, 2008, THE PROJECT SITE IS NOT LOCATED IN A SPECIAL FLOOD HAZARD AREA.



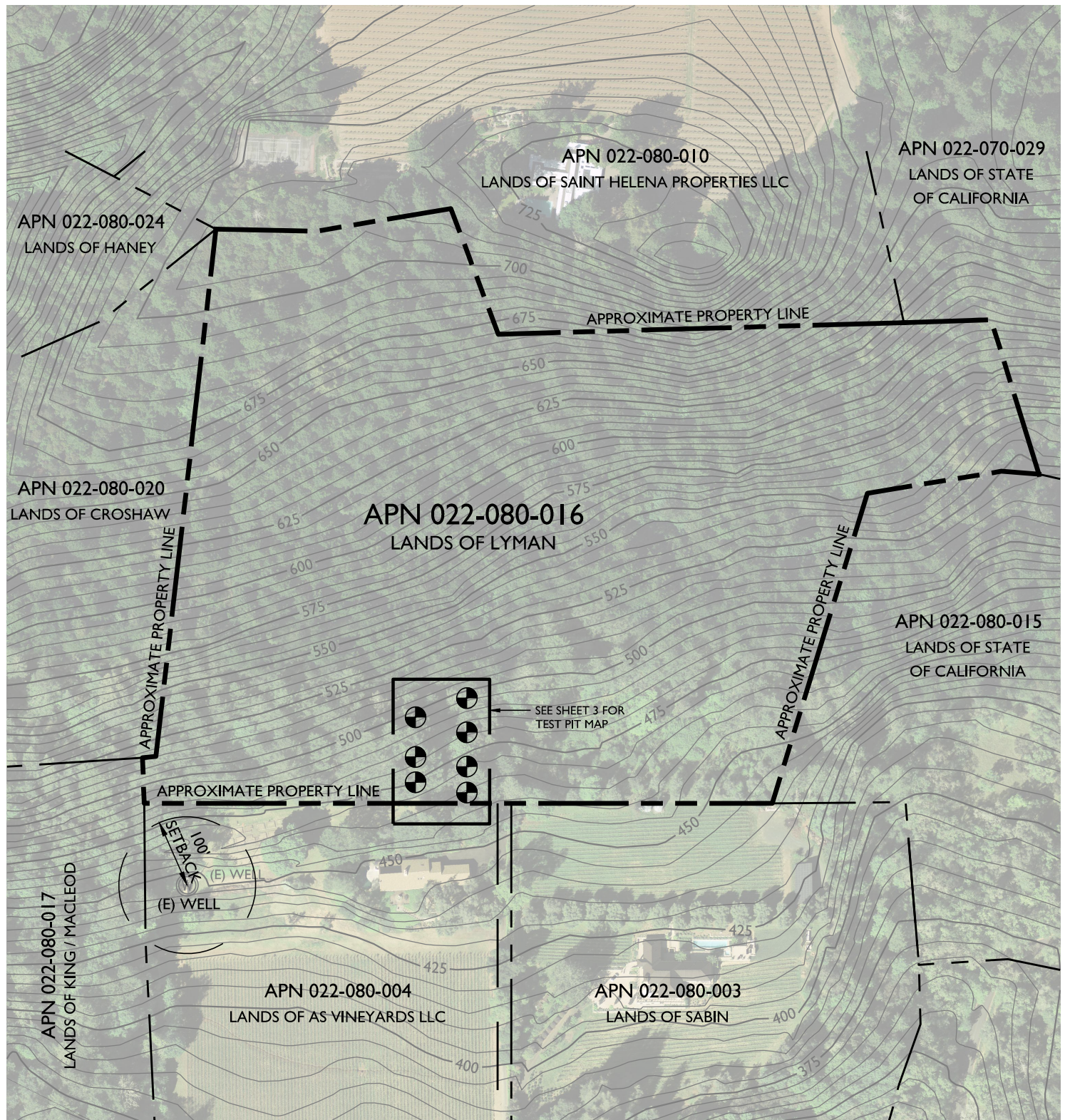
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 ST. HELENA, CA 94574



SCALE: 1" = 2,000'





## OVERALL SITE PLAN

SCALE: 1" = 200'

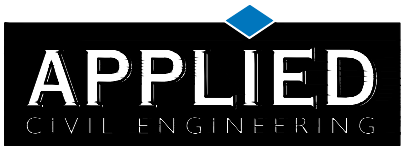
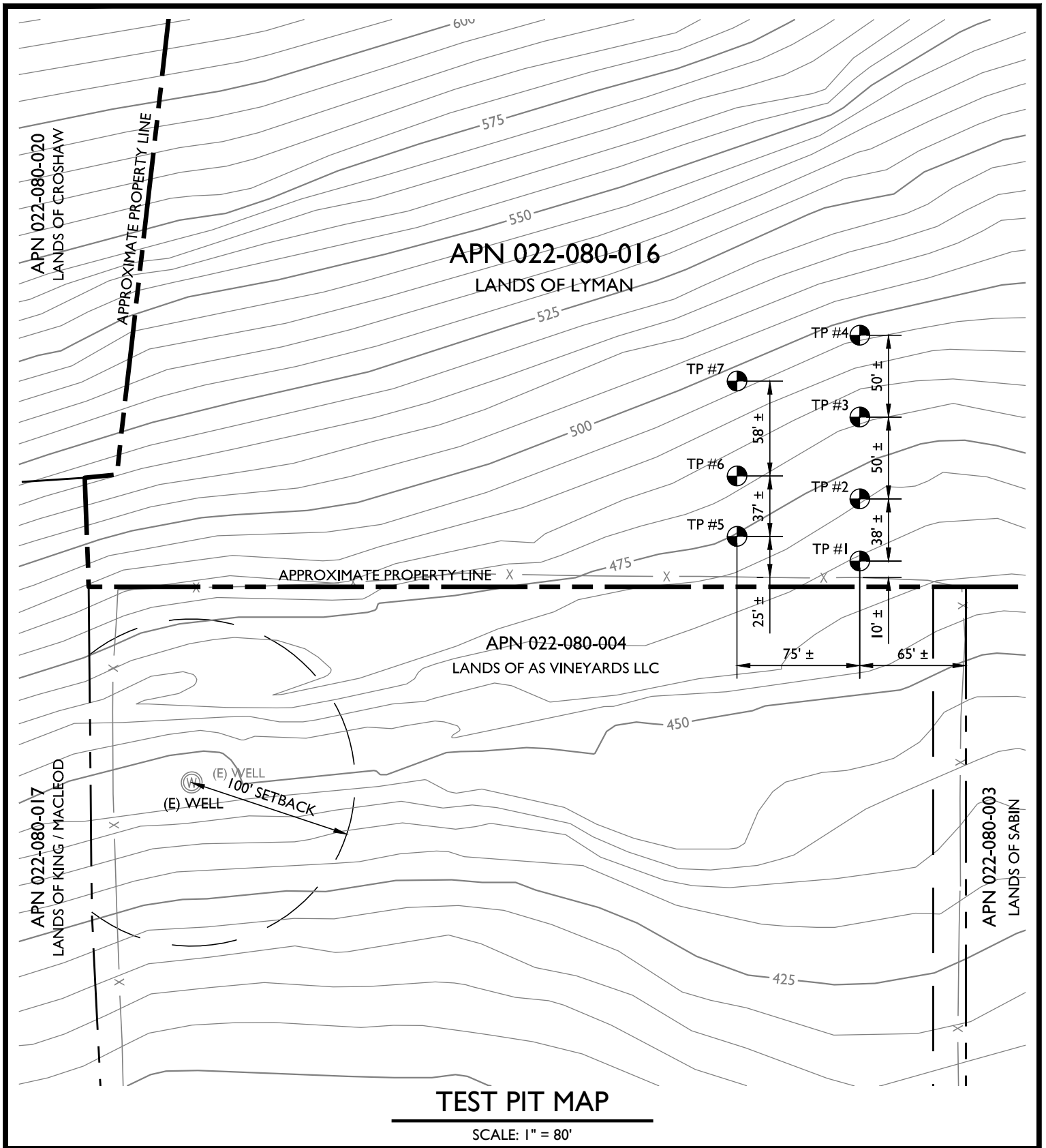


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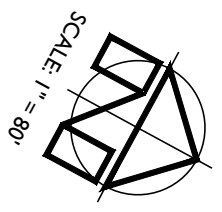
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*Experience is the difference*

January 8, 2019

File: 9260.25

Mr. Mike Muelrath  
Applied Civil Engineering  
2074 West Lincoln Ave.  
Napa, CA 94558

**Subject:      Laboratory Test Results  
                  Soil Texture Analysis by  
                  Bouyoucos Hydrometer Method  
                  # 14-102**

Dear Mr. Muelrath:

This letter transmits the results of our laboratory testing performed for the subject project. We performed a Soil Texture Analysis by the Bouyoucos Hydrometry Method with the following results:

<b>Size/Density</b>	<b>TP-2 Lyman</b>
+ #10 Sieve	48.9 %
Sand	46.0 %
Clay	4.6 %
Silt	49.4 %
Db g/cc	--

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

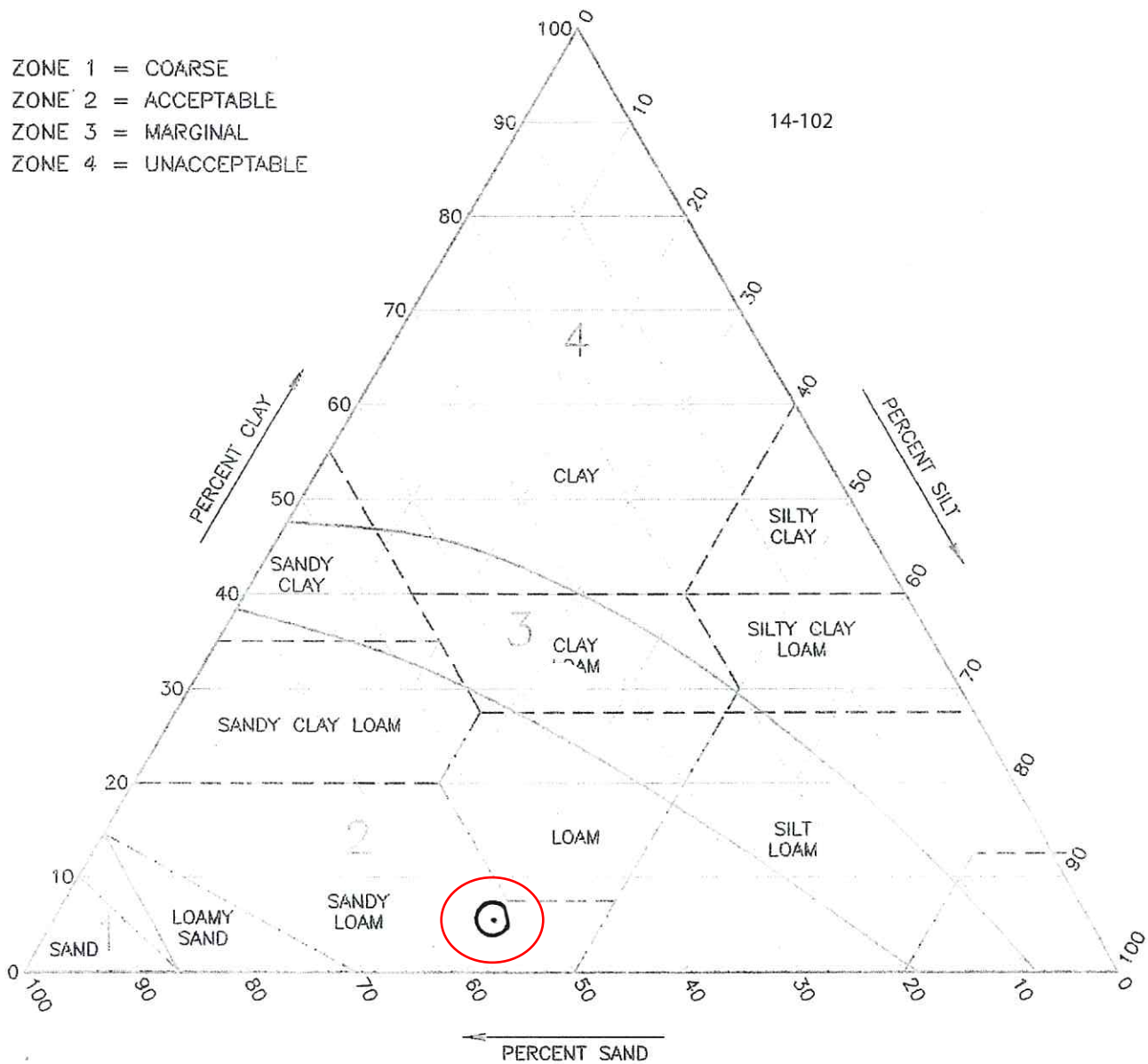
Yours very truly,

**RGH GEOTECHNICAL**

George Fotou  
Laboratory Manager

# SOIL PERCOLATION SUITABILITY CHART

- 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.

## Note:

For soils falling in sand, loamy sand or sandy loam classification bulk density analysis will generally not affect suitability and analysis not necessary.