Onsite Wastewater Disposal Feasibility Study

Arrow and Branch Winery, Use Permit Major Modification P23-00057
Planning Commission Hearing Date September 17, 2025

APPLIED
CIVIL ENGINEERING
INCORPORATED

January 6, 2023
September 9, 2024 – Revision #1

Job No. 20-139

Kim Withrow, REHS
Environmental Health Division
Napa County Planning, Building and Environmental Services Department
1195 Third Street, Suite 210
Napa, CA 94559

Re: Onsite Wastewater Disposal Feasibility Study for the
A&B Vineyards LLC Winery Use Permit Modification Application
5215 Solano Avenue, Napa, California APN 034-190-040

Dear Ms. Withrow:

At the request of A&B Vineyards LLC we have evaluated the process and sanitary wastewater flows associated with the proposed Use Permit Modification. The winery is currently under construction, so wastewater systems have been designed and permitted but not yet installed. As part of our work we have also analyzed the capacity of the permitted process and sanitary wastewater systems that will serve the winery facility to determine if they are adequate to serve the proposed changes in use.

Existing development on the property includes approximately six acres of vineyards, two wells, access roads, winery buildings under construction and the related access and utility infrastructure typical of this type of agricultural and winery development.

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

- Wine Production:
  - 45,000 gallons of wine per year
  - Crushing, fermenting, aging and bottling

- Employees:
  - 5 combined full-time and part time

- Marketing Plan:
  - Daily Tours and Tastings by Appointment
    - 34 visitors per day maximum

- Marketing Events Type #1
  - 12 per year
  - 30 guests maximum
  - Food prepared offsite by catering company
- Marketing Events Type #2
  - 2 per year
  - 125 guests maximum
  - Food prepared offsite by catering company
  - Portable toilets used for restrooms

Please see the A&B Vineyards LLC Use Permit Modification Conceptual Site Improvement Plans prepared by Applied Civil Engineering (attached) for approximate locations of existing and proposed facilities.

The remainder of this letter describes the process and sanitary wastewater disposal system design capacities, peak flows associated with the proposed changes in use and our analysis and recommendations related to the existing permitted but not installed process and sanitary wastewater disposal systems' ability to handle the anticipated wastewater flows.

Permitted Process Wastewater System

The permitted and constructed process wastewater treatment and disposal system consists of a Specialty Treatment Solutions membrane bioreactor pretreatment system followed by subsurface disposal via a geoflow drip type dispersal field. The system was designed for a calculated peak flow of 1,000 gpd however the pretreatment system was sized for 2,500 gpd instantaneous maximum to allow for operational flexibility and surge flows. The subsurface drip dispersal field was sized for 1,000 gpd which required 834 lineal feet (1,667 sf) of drip tubing however the field size was increased slightly to make best use of the available space and provide 1,200 lineal feet (2,400 sf) of drip tubing.

Permitted Sanitary Wastewater System

The permitted and constructed sanitary wastewater treatment and disposal system consists of an Orenco AdvanTex pretreatment system followed by subsurface disposal via a geoflow drip type dispersal field. The system was designed for a calculated peak flow of 255 gpd which required 213 lineal feet (425 sf) of drip tubing however the filed size was increased slightly to make best use of the available space and provide 300 lineal feet (600 sf) of drip tubing.

Proposed Process Wastewater Design Flows

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 45,000-gallon production capacity and the expectation that both white and red wine will be produced at the winery, we have assumed a conservative 45 day crush period. Using these

assumptions, the annual, average daily and peak winery process wastewater flows are calculated as follows:

$$\text{Annual Winery Process Wastewater Flow} = \frac{45{,}000 \text{ gallons wine}}{\text{year}} \times \frac{6 \text{ gallons wastewater}}{1 \text{ gallon wine}}$$

Annual Winery Process Wastewater Flow = 270,000 gallons per year

$$\text{Average Daily Process Wastewater Flow} = \frac{270{,}000 \text{ gallons wastewater}}{\text{year}} \times \frac{1 \text{ year}}{365 \text{ days}}$$

Average Daily Winery Process Wastewater Flow = 740 gallons per day

$$\text{Peak Winery Process Wastewater Flow} = \frac{45{,}000 \text{ gallons wine}}{\text{year}} \times \frac{1.5 \text{ gallons wastewater}}{1 \text{ gallon wine}} \times \frac{1 \text{ year}}{45 \text{ crush days}}$$

Peak Winery Process Wastewater Flow = 1,500 gallons per day (gpd)

Proposed Winery Sanitary Wastewater Design Flows

The peak sanitary wastewater flow from the winery 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. For marketing events that will have catered meals that are prepared offsite we have estimated 5 gallons of wastewater per guest assuming there will be no food preparation or cleanup onsite. All events with more than 30 guests will utilize portable toilets. Based on these assumptions, the peak winery sanitary wastewater flows are calculated as follows:

Employees

Peak Sanitary Wastewater Flow = 5 employees X 15 gpd per employee
Peak Sanitary Wastewater Flow = 75 gpd

Daily Tastings

Peak Sanitary Wastewater Flow = 34 visitors per day X 3 gallons per visitor
Peak Sanitary Wastewater Flow = 102 gpd

Marketing Events #1 (12 per year)

Peak Sanitary Wastewater Flow = 30 guests X 5 gallons per guest
Peak Sanitary Wastewater Flow = 150 gpd

Marketing Events #2 (2 per year)

Peak Sanitary Wastewater Flow = 125 guests X 5 gallons per guest
Peak Sanitary Wastewater Flow = 625 gpd

Total Peak Winery Sanitary Wastewater Flow

In order to manage the peak sanitary wastewater flows to the disposal field portable toilets will be used for all events with more than 30 guests in attendance and daily tours and tastings will not occur on marketing event days. Therefore, the worst-case peak winery sanitary wastewater flow is calculated based on 5 employees and a marketing event for 30 people. The peak flow for this scenario is calculated as follows:

Total Peak Winery Sanitary Wastewater Flow = 75 gpd + 150 gpd

Total Peak Winery Sanitary Wastewater Flow = 225 gpd

Existing Process and Sanitary Wastewater System Capacities

Process Wastewater System Capacity
As noted above the permitted process wastewater system overall design capacity is 1,000 and the pretreatment unit can handle peak day maximums of 2,500 gpd.

Sanitary Wastewater System Capacity
As noted above the permitted sanitary wastewater system design capacity is 255 gpd.

Proposed Design Flow vs Existing Capacity

Process Wastewater System Capacity
The predicted Peak Winery Process Wastewater Flow for the proposed winery operational characteristics (1,500 gpd) is more than the design capacity of the permitted subsurface drip dispersal field (1,000 gpd) but is less than the capacity of the pretreatment system (2,500 gpd). As noted above the design includes 2,400 square feet of dispersal field area which is well in excess of the required 1,667 square feet. This corresponds to an actual capacity of 1,440 gpd based on an application rate of 0.6 gpd/sf which is slightly less than the predicted Peak Winery Process Wastewater Flow (1,500 gpd).

Sanitary Wastewater System Capacity
The predicted Peak Winery Sanitary Wastewater Flow for the proposed winery operational characteristics (225 gpd) is less than the design capacity of the permitted subsurface drip dispersal field (255 gpd). As noted above the design includes 600 square feet of dispersal field area which is well in excess of the required 425 square feet. This corresponds to an actual capacity of 360 gpd based on an application rate of 0.6 gpd/sf which is also in excess of the predicted Peak Winery Sanitary Wastewater Flow (225 gpd).

Recommendations

The predicted Peak Winery Process Wastewater Flow exceeds the capacity of the existing system but the predicted Peak Winery Sanitary Wastewater Flow is within the capacity of the existing system. Therefore, design adjustments are needed to accommodate the new process wastewater flow increase. Improvements are not needed for the sanitary wastewater system as the existing permitted design is adequate to handle the proposed flows.

We have explored options for modifying the design of the winery process wastewater system to accommodate the increased flows. Our recommendations below focus only on the process wastewater system.

Option #1 – Expand Existing System

The 1,500 gpd design flow equates to 2,500 sf of subsurface drip dispersal area based on the 0.6 gpd/sf loading rate. The primary area could easily be expanded from the current design of 2,400 sf to the required 2,500 sf in the area of the previously tested soil. All application of treated winery process wastewater to a subsurface disposal system must comply with the requirements of the Statewide General Waste Discharge Requirements (WDRs) for Wineries in California and the currently in-progress NOI for coverage under this permit will have to be revised accordingly.

Reserve Area

A commensurate increase in reserve area (200% of primary area) would also be required to provide 5,000 sf of reserve area. This reserve area can be accommodated in the vicinity of the originally designed reserve area.

Option #2 – Capture Treated PW and Re-Use for Irrigation

In this scenario the process wastewater would be collected in an irrigation storage tank and then be used for vineyard and/or landscape irrigation rather than being disposed of in the in-ground system. No change is needed to the pretreatment system as it can adequately handle the proposed design flows and provide water of the quality needed for surface irrigation.

Process Wastewater Disposal / Re-Use for Irrigation

We propose that disposal of the treated winery process wastewater be via irrigation of the onsite vineyard (and/or potentially landscaping as well). For the purpose of this study we have assumed that the winery process wastewater will be applied to approximately four acres of vineyard that is located to the west of the new winery building and outside of the well setbacks. This is a conservative assumption to simplify this analysis as more vineyard is available outside of the required setbacks and the treated water can also be used for landscape irrigation. The final irrigation area will be determined and incorporated into the final design with the installation permit application.

In order to accommodate differences in the timing of wastewater generation, irrigation demand, and limitations on wet weather application of treated wastewater a storage tank will be required. We have prepared a water balance calculation to size a tank that will temporarily store treated wastewater generated from the winery before it is applied to the vineyard. The water balance

calculations assume a monthly winery process wastewater generation rate and a monthly vineyard irrigation schedule based on our past experience with projects of this type. The water balance further assumes that during the summer the treated wastewater will be used to offset the irrigation needs of the vineyard and in the winter application of treated winery process wastewater will not occur to prevent runoff. The water balance calculations show that the proposed land application area is large enough to accept all the wastewater generated each month throughout the irrigation system and that a tank with a volume of at least 81,000 gallons is required to capture water from the non-irrigation season to use during the irrigation season. year without carry over (see attached). This tank will also be able to contain more than a weeks' worth of peak flow to allow flexibility in irrigation scheduling during the harvest period.

All land application of treated winery process wastewater must comply with the requirements of the Statewide General Waste Discharge Requirements (WDRs) for Wineries in California and the currently in-progress NOI for coverage under this permit will have to be revised accordingly.

Summary

The calculations presented above illustrate that the wastewater flows associated with the proposed Use Permit Modification will exceed the capacity of the permitted process wastewater system but will not exceed the capacity of the permitted sanitary wastewater system. However, there are at least two options for how to handle the planned increased process wastewater flow rates which include adding to the existing system and capturing the treated water and re-using it for irrigation.

We trust that this provides the information you need to process the subject Use Permit Modification. Please feel free to contact us at (707) 320-4968 if you have any questions.

Sincerely,

Applied Civil Engineering Incorporated

By:

Michael R. Muelrath

Michael R. Muelrath RCE 67435
Principal

Copy:

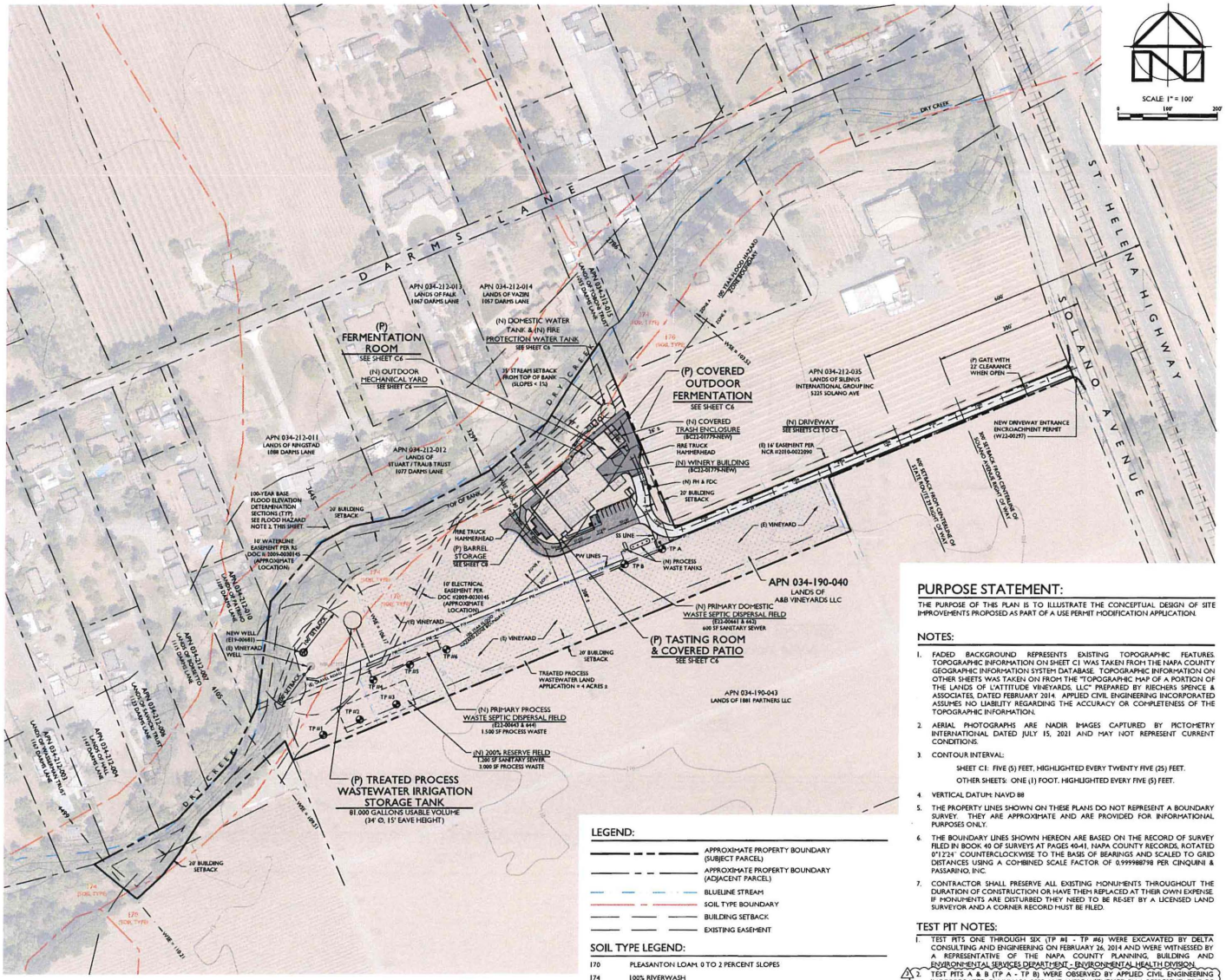
Steve Contursi, A&B Vineyards LLC (via email)
Donna Oldford, Plans4Wine (via email)

Attachments:

A&B Vineyards LLC Use Permit Modification Conceptual Site Improvement Plans
Water Balance Spreadsheets

A&B VINEYARDS LLC

USE PERMIT MODIFICATION CONCEPTUAL SITE IMPROVEMENT PLANS



OVERALL SITE PLAN
SCALE: 1" = 100'

LOCATION MAP
SCALE: 1" = 3,000'

PROJECT INFORMATION:

PROPERTY OWNER & APPLICANT:
A&B VINEYARDS LLC
1042 NORTH COAST HIGHWAY
LAGUNA BEACH, CA 92651

SITE ADDRESS:
5215 SOLANO AVENUE
NAPA, CA 94558

ASSESSOR'S PARCEL NUMBER:
034-190-040

PARCEL SIZE:
10.1 ± ACRES

PROJECT SIZE:
2.0 ± ACRES

ZONING:
AGRICULTURAL PRESERVE (AP)

DOMESTIC WATER SOURCE:
PRIVATE WELL

FIRE PROTECTION WATER SOURCE:
STORAGE TANK

WASTEWATER DISPOSAL:
ONSITE TREATMENT AND DISPERSAL

SHEET INDEX:

PURPOSE STATEMENT:

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

NOTES:

1. FADED BACKGROUND REPRESENTS EXISTING TOPOGRAPHIC FEATURES. TOPOGRAPHIC INFORMATION ON SHEET C1 WAS TAKEN FROM THE NAPA COUNTY GEOGRAPHIC INFORMATION SYSTEM DATABASE. TOPOGRAPHIC INFORMATION ON OTHER SHEETS WAS TAKEN FROM THE "TOPOGRAPHIC MAP OF A PORTION OF THE LANDS OF L'ATTITUDE VINEYARDS, LLC" PREPARED BY RIECHERS SPENCE & ASSOCIATES, DATED FEBRUARY 2014. APPLIED CIVIL ENGINEERING INCORPORATED ASSUMES NO LIABILITY REGARDING THE ACCURACY OR COMPLETENESS OF THE TOPOGRAPHIC INFORMATION.
2. AERIAL PHOTOGRAPHS ARE NADIR IMAGES CAPTURED BY PICTOMETRY INTERNATIONAL DATED JULY 15, 2021 AND MAY NOT REPRESENT CURRENT CONDITIONS.
3. CONTOUR INTERVAL:
   SHEET C1: FIVE (5) FEET, HIGHLIGHTED EVERY TWENTY FIVE (25) FEET.
   OTHER SHEETS: ONE (1) FOOT, HIGHLIGHTED EVERY FIVE (5) FEET.
4. VERTICAL DATUM: NAVD 88
5. THE PROPERTY LINES SHOWN ON THESE PLANS DO NOT REPRESENT A BOUNDARY SURVEY. THEY ARE APPROXIMATE AND ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.
6. THE BOUNDARY LINES SHOWN HEREON ARE BASED ON THE RECORD OF SURVEY FILED IN BOOK 40 OF SURVEYS AT PAGES 40-41, NAPA COUNTY RECORDS, ROTATED 0°12'24" COUNTERCLOCKWISE TO THE BASIS OF BEARINGS AND SCALED TO GRID DISTANCES USING A COMBINED SCALE FACTOR OF 0.999988798 PER CINQUINI & PASSARINO, INC.
7. CONTRACTOR SHALL PRESERVE ALL EXISTING MONUMENTS THROUGHOUT THE DURATION OF CONSTRUCTION OR HAVE THEM REPLACED AT THEIR OWN EXPENSE. IF MONUMENTS ARE DISTURBED THEY NEED TO BE RE-SET BY A LICENSED LAND SURVEYOR AND A CORNER RECORD MUST BE FILED.

LEGEND:

- APPROXIMATE PROPERTY BOUNDARY (SUBJECT PARCEL)
- APPROXIMATE PROPERTY BOUNDARY (ADJACENT PARCEL)
- BLUELINE STREAM
- SOIL TYPE BOUNDARY
- BUILDING SETBACK
- EXISTING EASEMENT

SOIL TYPE LEGEND:

170	PLEASANTON LOAM, 0 TO 2 PERCENT SLOPES
174	100% RIVERWASH

SOIL TYPE BOUNDARIES SHOWN ON THIS MAP ARE BASED ON THE NAPA COUNTY GEOGRAPHIC INFORMATION SYSTEM DATA AND SHOULD BE CONSIDERED APPROXIMATE.

TEST PIT NOTES:

1. TEST PITS ONE THROUGH SIX (TP #1 - TP #6) WERE EXCAVATED BY DELTA CONSULTING AND ENGINEERING ON FEBRUARY 26, 2014 AND WERE WITNESSED BY A REPRESENTATIVE OF THE NAPA COUNTY PLANNING, BUILDING AND ENVIRONMENTAL SERVICES DEPARTMENT - ENVIRONMENTAL HEALTH DIVISION.
2. TEST PITS A & B (TP A - TP B) WERE OBSERVED BY APPLIED CIVIL ENGINEERING INCORPORATED ON JULY 26, 2023 AND WERE WITNESSED BY A REPRESENTATIVE OF THE NAPA COUNTY PLANNING, BUILDING AND ENVIRONMENTAL SERVICES DEPARTMENT - ENVIRONMENTAL HEALTH DIVISION.

FLOOD HAZARD NOTES:

1. ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) MAP NUMBER 06055C0505F, EFFECTIVE SEPTEMBER 29, 2010, ALL OR A PORTION OF THE PROJECT SITE IS LOCATED IN A SPECIAL FLOOD HAZARD AREA SUBJECT TO INUNDATION BY THE 1% CHANCE ANNUAL FLOOD (100 YEAR FLOOD). THE APPROXIMATE FLOOD HAZARD BOUNDARY LINE IS SHOWN ON THIS PLAN. SEE FIRM FOR ADDITIONAL INFORMATION.
2. A DETAILED FLOOD STUDY WAS PREPARED BY SCHAAF AND WHEELER AND THE BASE FLOOD ELEVATION AT THE BUILDING SITE ACCORDING TO THAT STUDY IS APPROXIMATELY 105.30 +/- (NAVD 88). THE FLOODWATER ELEVATION WOULD BE CONTAINED WITHING THE BANKS OF DRY CREEK. THE BUILDING WILL NONETHELESS BE ELEVATED MORE THAN 1' ABOVE THE BFE.

EXISTING WINERY PERMIT SUMMARY:

PURPOSE:	PERMIT NUMBER:
PRIOR WINERY USE PERMIT MODIFICATION	P21-00087 (PHASE 1)
GRADING PERMIT	ENG22-00010
FLOODPLAIN PERMIT	ENF22-00020
WINERY BUILDING PERMIT	BC22-01079-NEW
UTILITY-OTHER PERMIT	BC22-01081
FIRE SPRINKLERS PERMIT	F22-00292
FIRE ALARM PERMIT	F22-00258
PROCESS WASTEWATER	E22-00644
SANITARY WASTEWATER	E22-00622

APPLIED INCORPORATED
2160 Jefferson Street, Suite 230
Napa, CA 94559
(707) 320-4968 | www.appliedcivil.com

A&B VINEYARDS LLC
USE PERMIT MODIFICATION CONCEPTUAL SITE IMPROVEMENT PLANS
OVERALL SITE PLAN

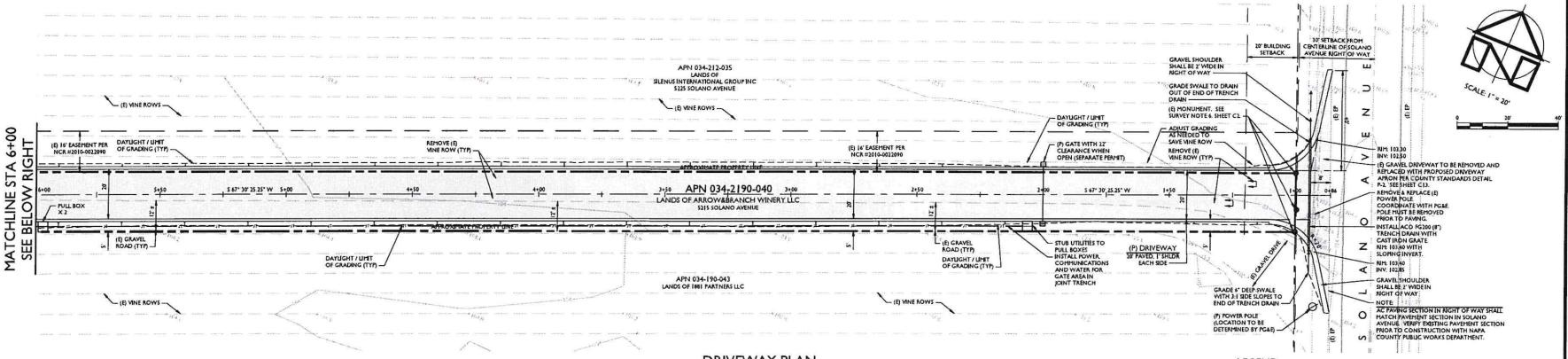
PREPARED UNDER THE DIRECTION OF:

REGISTERED PROFESSIONAL ENGINEER — MARK R. MORRISON — No. 72010 — CIVIL — STATE OF CALIFORNIA
FOR USE PERMIT APPLICATION — NOT FOR CONSTRUCTION

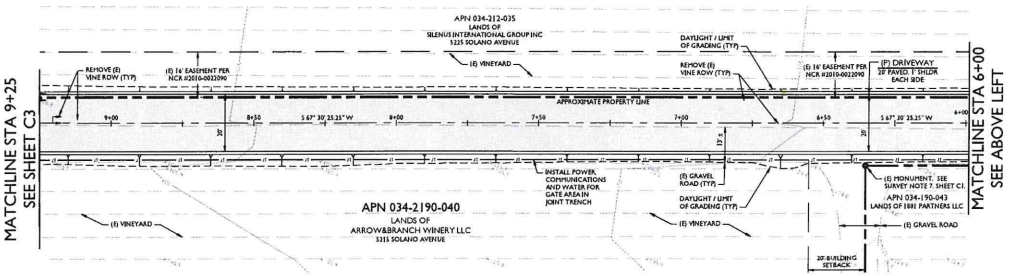
DRAWN BY: PowerCAD LLC
CHECKED BY: MRM
DATE: SEPTEMBER 6, 2023

REVISIONS:	BY:
3/10/2023 PERMIT SUBMITTAL	YMS
⚠1 5/10/2023 PERMIT RESUBMITTAL	YMS
⚠2 9/6/2023 PERMIT RESUBMITTAL	YMS
⚠3 8/9/2024 PERMIT RESUBMITTAL	YMS

JOB NUMBER: 20-139
FILE: 20-139CONC-OSP.DWG
ORIGINAL SIZE: 24" X 36"
SHEET NUMBER: C1
OF 8



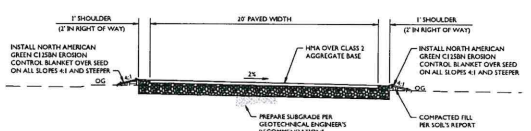
DRIVEWAY PLAN
STA 0+86 TO STA 6+00
SCALE: 1" = 20'



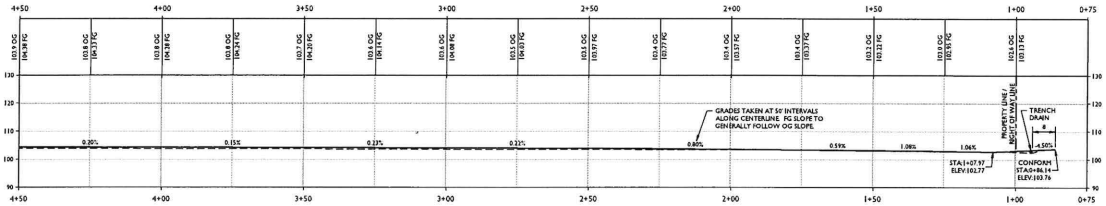
DRIVEWAY PLAN
STA 6+00 TO STA 9+25
SCALE: 1" = 20'

LEGEND:

- APPROXIMATE PROPERTY BOUNDARY (SUBJECT PARCEL)
- APPROXIMATE PROPERTY BOUNDARY (ADJACENT PARCEL)
- EXISTING EASEMENT OR SETBACK
- EXISTING EDGE OF PAVEMENT
- EXISTING EDGE OF DIRT / GRAVEL ROAD
- EXISTING VINE ROW
- EXISTING VINEYARD BOUNDARY
- PROPOSED EDGE OF PAVEMENT AND SHOULDER
- PROPOSED DAYLIGHT / LIMIT OF GRADING
- PROPOSED JOINT TRENCH
- PROPOSED ASPHALT CONCRETE PAVING



TYPICAL DRIVEWAY SECTION
SCALE: 1" = 5'



DRIVEWAY PROFILES
STA 0+75 TO STA 9+25
SCALE: 1" = 20'

APPLIED CIVIL ENGINEERING INCORPORATED
2160 Jefferson Street, Suite 250
Napa, CA 94559
(707) 320-4968 | www.appliedcivil.com

A&B VINEYARDS LLC

USE PERMIT MODIFICATION CONCEPTUAL SITE IMPROVEMENT PLANS
DRIVEWAY PLAN & PROFILE STA 0+50 TO STA 9+25

PREPARED UNDER THE DIRECTION OF:

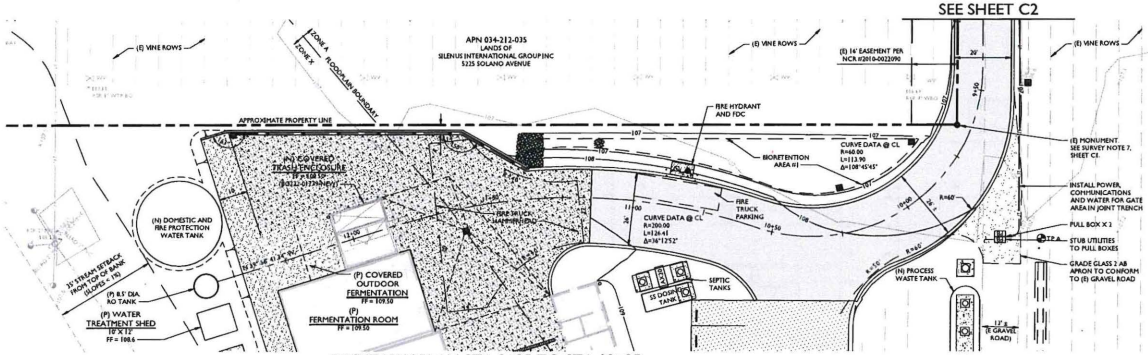
REGISTERED PROFESSIONAL ENGINEER — CIVIL — STATE OF CALIFORNIA — FOR USE AS CONCEPT ONLY — NOT FOR CONSTRUCTION

DRAWN BY: PowerCAD LLC
CHECKED BY: PRM
DATE: AUGUST 9, 2024

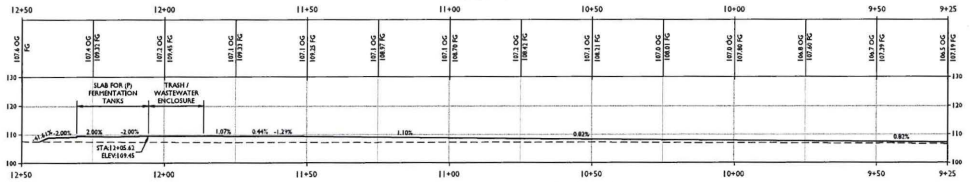
REVISIONS:	BY:
3/10/2023 PERMIT SUBMITTAL	YMS
1 5/10/2023 PERMIT RESUBMITTAL	YMS
1 9/6/2023 PERMIT RESUBMITTAL	YMS
1 8/9/2024 PERMIT RESUBMITTAL	YMS

JOB NUMBER: 20-139
FILE: 20-139MP-DWY.DWG
ORIGINAL SIZE: 24" X 36"
SHEET NUMBER: C2
OF 8

MATCHLINE STA 9+25
SEE SHEET C2



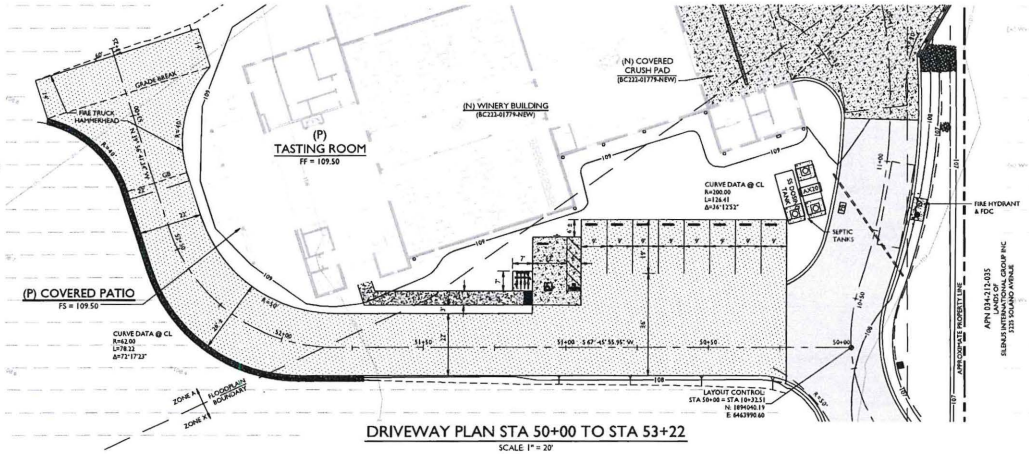
DRIVEWAY PLAN STA 9+25 TO STA 12+25
SCALE 1" = 20'



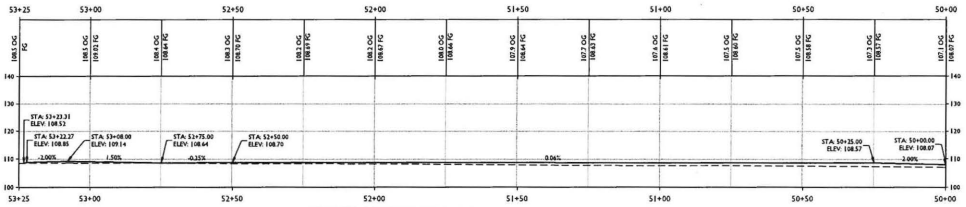
DRIVEWAY PROFILE STA 9+25 TO STA 12+50
SCALE 1" = 20'

LEGEND:

- APPROXIMATE PROPERTY BOUNDARY (SUBJECT PARCEL)
- APPROXIMATE PROPERTY BOUNDARY (ADJACENT PARCEL)
- EXISTING EASEMENT OR SETBACK
- EXISTING EDGE OF PAVEMENT
- EXISTING EDGE OF DIRT / GRAVEL ROAD
- EXISTING FENCE
- EXISTING FLOWLINE
- EXISTING GRADE BREAK / TOP OF BANK
- EXISTING TOE OF BANK
- EXISTING VINE ROW
- EXISTING VINEYARD BOUNDARY
- PROPOSED EDGE OF PAVEMENT AND SHOULDER
- PROPOSED DAYLIGHT / LIMIT OF GRADING
- PROPOSED TOP OF BANK / GRADE BREAK
- PROPOSED RETAINING WALL
- PROPOSED BUILDING
- PROPOSED SINGLE POLE SIGN
- PROPOSED WHEEL STOP
- PROPOSED ACCESSIBLE PARKING
- PROPOSED DRAIN INLET
- PROPOSED ENERGY DISSIPATOR
- PROPOSED HEAVY DUTY PCC PAVING
- PROPOSED LIGHT DUTY PCC PAVING
- PROPOSED GRAVEL PAVING
- PROPOSED CHIP SEAL PAVING
- PROPOSED ASPHALT CONCRETE PAVING
- PROPOSED DECOMPOSED GRANITE PAVING
- PROPOSED PAVERS SET IN CONCRETE
- PROPOSED ROCK



DRIVEWAY PLAN STA 50+00 TO STA 53+22
SCALE 1" = 20'



DRIVEWAY PROFILE STA 50+00 TO STA 53+25
SCALE 1" = 20'

APPLIED
INCORPORATED
2160 Jefferson Street, Suite 230
Napa, CA 94559
(707) 320-4188 | www.appliedinc.com

A&B VINEYARDS LLC

USE PERMIT MODIFICATION CONCEPTUAL SITE IMPROVEMENT PLANS
DRIVEWAY PLAN & PROFILE STA 9+25 TO STA 53+25

PREPARED UNDER THE DIRECTION OF:

REGISTERED PROFESSIONAL ENGINEER
YOUNG MIN SUH
No. 83502
CIVIL
STATE OF CALIFORNIA
FOR PLANNING PURPOSES ONLY
NOT FOR CONSTRUCTION

DRAWN BY:	PowerCAD LLC
CHECKED BY:	YMS
DATE:	AUGUST 9, 2024

REVISIONS:	BY:
3/10/2023 PERMIT SUBMITTAL	YMS
⚠ 5/10/2023 PERMIT RESUBMITTAL	YMS
⚠ 9/6/2023 PERMIT RESUBMITTAL	YMS
⚠ 8/9/2024 PERMIT RESUBMITTAL	YMS

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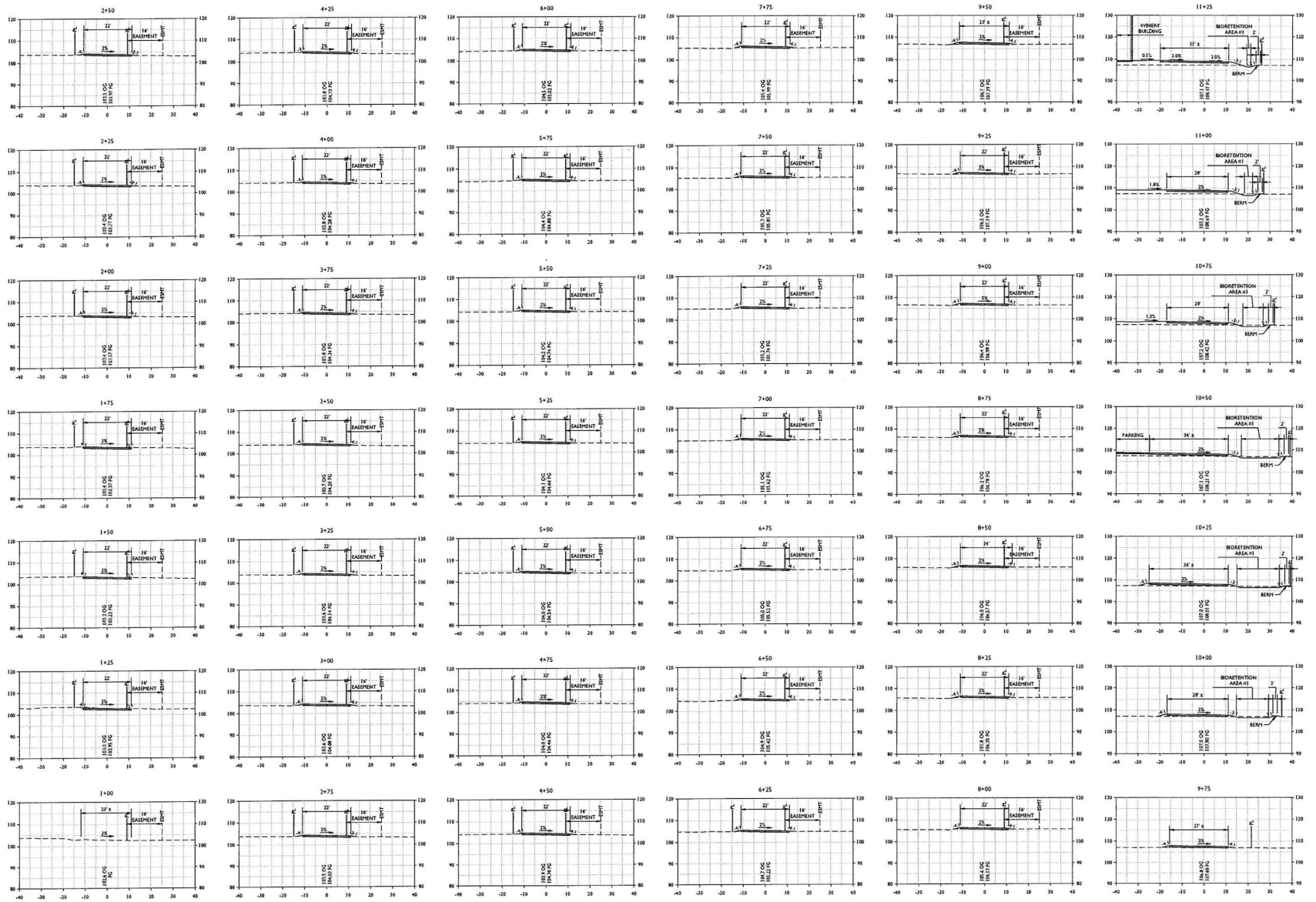


DRIVEWAY CROSS SECTIONS STA 1+00 TO STA 11+25

SCALE: 1" = 20'

APPLIED INCORPORATED
Civil Engineering
2160 Jefferson Street, Suite 230
Napa, CA 94559
(707) 320-4968 | www.appliedcivil.com

A&B VINEYARDS LLC

USE PERMIT MODIFICATION CONCEPTUAL SITE IMPROVEMENT PLANS
DRIVEWAY CROSS SECTIONS STA 1+00 TO STA 11+25

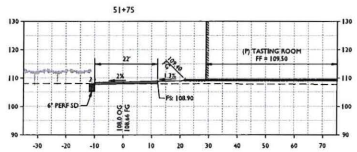
PREPARED UNDER THE DIRECTION OF:

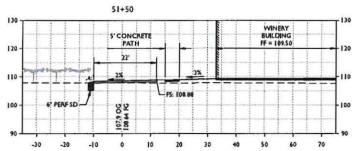
REGISTERED PROFESSIONAL ENGINEER
MICHAEL R. MCCORKLE
No. 82012
CIVIL
STATE OF CALIFORNIA
FOR REVIEW ONLY
NOT FOR CONSTRUCTION

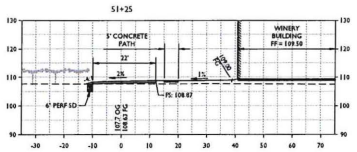
DRAWN BY: PowerCAD LLC
CHECKED BY: MRM
DATE: AUGUST 9, 2024

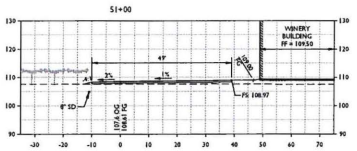
REVISIONS:	BY:
3/10/2023 PERMIT SUBMITTAL	YMS
1 5/10/2023 PERMIT RESUBMITTAL	YMS
2 9/6/2023 PERMIT RESUBMITTAL	YMS
3 8/9/2024 PERMIT RESUBMITTAL	YMS

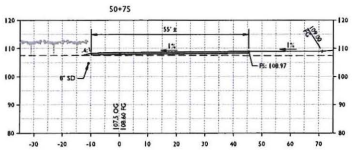
JOB NUMBER: 20-139
FILE: 20-139MP-DWY.DWG
ORIGINAL SIZE: 24" X 36"
SHEET NUMBER: C4
OF 8

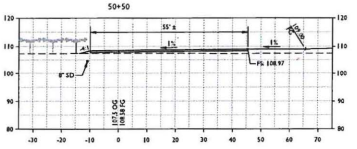


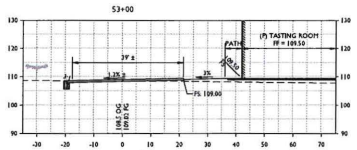


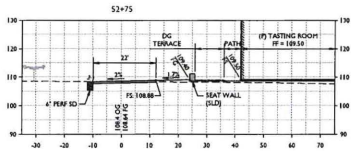


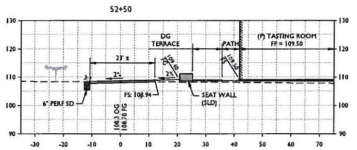


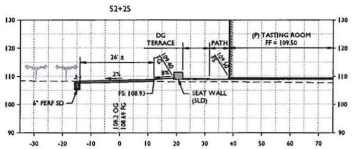


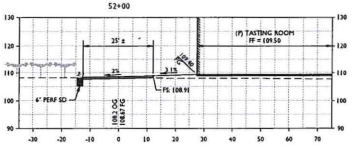






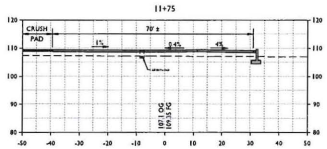


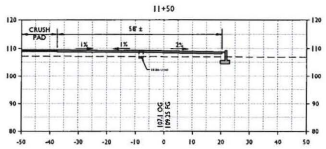




DRIVEWAY CROSS SECTIONS STA 50+50 TO STA 53+00

SCALE: 1" = 20'





DRIVEWAY CROSS SECTIONS STA 11+50 TO STA 11+75

SCALE: 1" = 20'

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A&B VINEYARDS LLC

USE PERMIT MODIFICATION CONCEPTUAL SITE IMPROVEMENT PLANS
DRIVEWAY CROSS SECTIONS STA 11+50 TO STA 53+00

PREPARED UNDER THE DIRECTION OF:

REGISTERED PROFESSIONAL ENGINEER
MARK R. MILLER
No. 73017
CIVIL
STATE OF CALIFORNIA

FOR PLANNING PURPOSES ONLY
NOT FOR CONSTRUCTION

DRAWN BY: PowerCAD LLC

CHECKED BY: MRM

DATE: AUGUST 9, 2024

REVISIONS:	BY:
3/10/2023 PERMIT SUBMITTAL	YMS
1 5/10/2023 PERMIT RESUBMITTAL	YMS
2 9/6/2023 PERMIT RESUBMITTAL	YMS
3 8/9/2024 PERMIT RESUBMITTAL	YMS

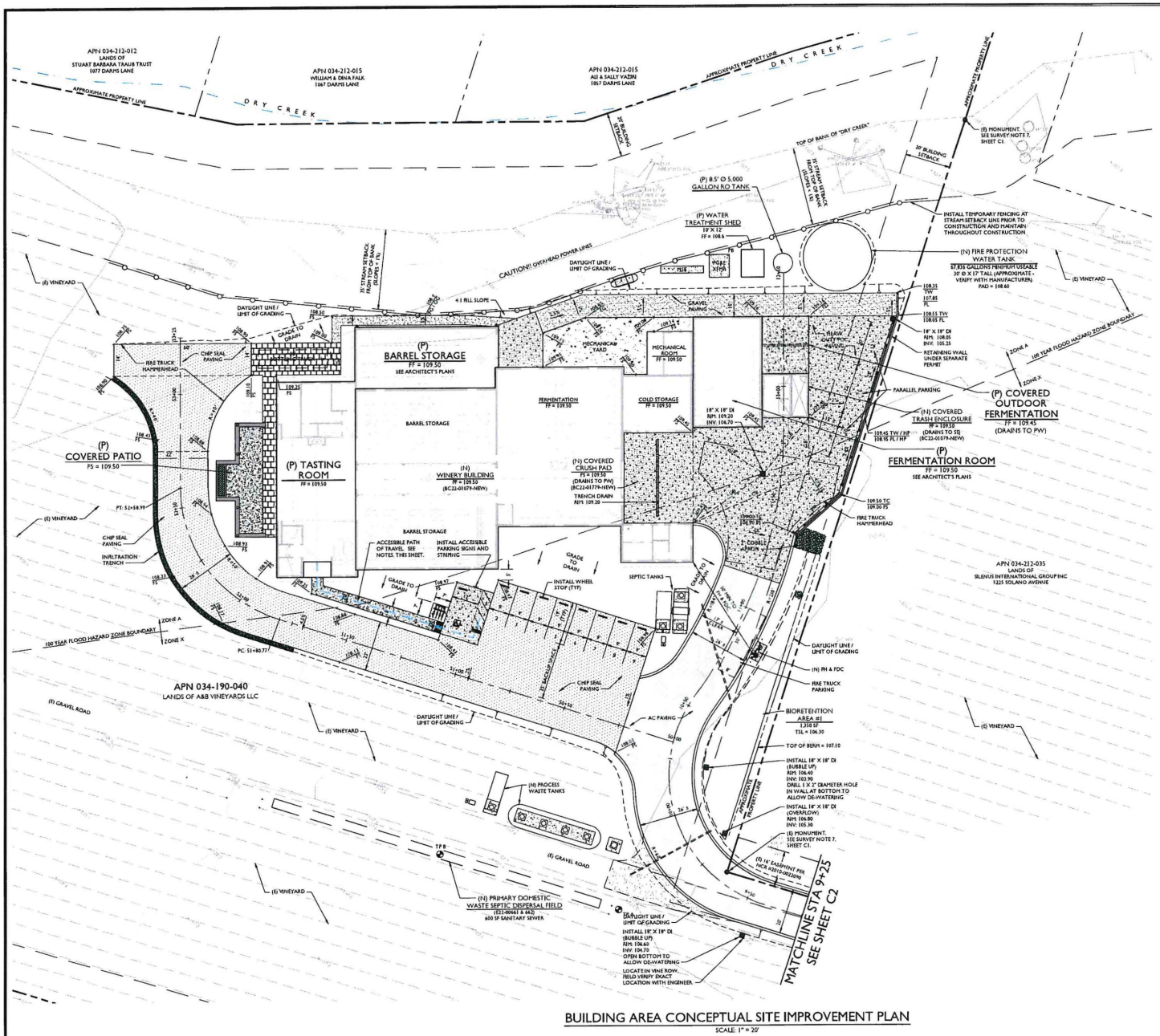
JOB NUMBER: 20-139

FILE: 20-139MP-DWY.DWG

ORIGINAL SIZE: 24" X 36"

SHEET NUMBER: C5

OF 8



BUILDING AREA CONCEPTUAL SITE IMPROVEMENT PLAN

SCALE: 1" = 20'

SCALE: 1" = 20'

0 20' 40'

LEGEND:

- APPROXIMATE PROPERTY BOUNDARY (SUBJECT PARCEL)
- APPROXIMATE PROPERTY BOUNDARY (ADJACENT PARCEL)
- EXISTING EASEMENT OR SETBACK
- EXISTING EDGE OF DIRT / GRAVEL ROAD
- EXISTING OVERHEAD POWER LINE
- EXISTING BLUE LINE STREAM
- EXISTING GRADE BREAK / TOP OF BANK
- EXISTING TOE OF BANK
- EXISTING VINE ROW
- EXISTING VINEYARD BOUNDARY
- PROPOSED EDGE OF PAVEMENT AND SHOULDER
- PROPOSED DAYLIGHT / LIMIT OF GRADING
- PROPOSED TOP OF BANK / GRADE BREAK
- PROPOSED RETAINING WALL
- PROPOSED BUILDING
- PROPOSED SINGLE POLE SIGN
- PROPOSED WHEEL STOP
- PROPOSED ACCESSIBLE PARKING
- PROPOSED DRAIN INLET
- PROPOSED ENERGY DISSIPATOR
- PROPOSED HEAVY DUTY PCC PAVING
- PROPOSED LIGHT DUTY PCC PAVING
- PROPOSED GRAVEL PAVING
- PROPOSED CHIP SEAL PAVING
- PROPOSED ASPHALT CONCRETE PAVING
- PROPOSED DECOMPOSED GRANITE PAVING
- PROPOSED ROCK
- PROPOSED PAVERS SET IN CONCRETE

ACCESSIBLE ROUTE OF TRAVEL NOTE:

ALL ACCESSIBLE ROUTES OF TRAVEL SHALL COMPLY WITH THE REQUIREMENTS OF CBC 11B. THE REQUIREMENTS INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

A. RUNNING SLOPE OF WALKING SURFACES SHALL NOTE EXCEED 5% (1:20)

B. RUNNING SLOPE OF RAMPS SHALL NOT EXCEED 8.33% (1:12)

C. CROSS SLOPE OF WALKS AND RAMPS NOT TO EXCEED 2.083% (1:48)

D. LANDING AND LEVEL AREA SLOPES NOT TO EXCEED 2.083% (1:48)

E. VERTICAL CHANGES IN LEVEL SHALL NOT EXCEED 1/4 INCH. ALL LEVEL CHANGES BETWEEN 1/4 INCH AND 1/2 SHALL BE BEVELED WITH A SLOPE NO STEEPER THAN 1:2 (V:H). ANY LEVEL CHANGES GREATER THAN 1/2 INCH SHALL BE RAMPED AND COMPLY WITH CBC 11B-405.

F. OPENINGS IN DRAINS AND GRATING SHALL NOT EXCEED 1/2 INCH IN PREDOMINANT DIRECTION OF TRAVEL

GRADING QUANTITIES*

CUT	600 ± CY
FILL	900 ± CY
NET**	300 ± CY (FILL)

* THIS 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 CONSTRUCTION PURPOSES. CONTRACTOR IS TO PERFORM THEIR OWN EARTHWORK CALCULATIONS AND SHALL NOT USE THE ESTIMATES PRESENTED ABOVE. THIS ESTIMATE IS BASED ON IN PLACE VOLUMES AND DOES NOT INCLUDE FLUFF, SHRINKAGE, PAVING, AGGREGATES OR SELECT FILL VOLUMES.

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A&B VINEYARDS LLC

USE PERMIT MODIFICATION CONCEPTUAL SITE IMPROVEMENT PLANS

BUILDING AREA CONCEPTUAL SITE IMPROVEMENT PLAN

PREPARED UNDER THE DIRECTION OF:

REGISTERED PROFESSIONAL ENGINEER MICHAEL R. MCDONALD No. 72127 CIVIL STATE OF CALIFORNIA

NOT FOR CONSTRUCTION

DRAWN BY: PowerCAD LLC

CHECKED BY: MRM

DATE: AUGUST 9, 2024

REVISIONS:	BY:
3/10/2023 PERMIT SUBMITTAL	YMS
1 5/10/2023 PERMIT RESUBMITTAL	YMS
1 9/6/2023 PERMIT RESUBMITTAL	YMS
1 8/9/2024 PERMIT RESUBMITTAL	YMS

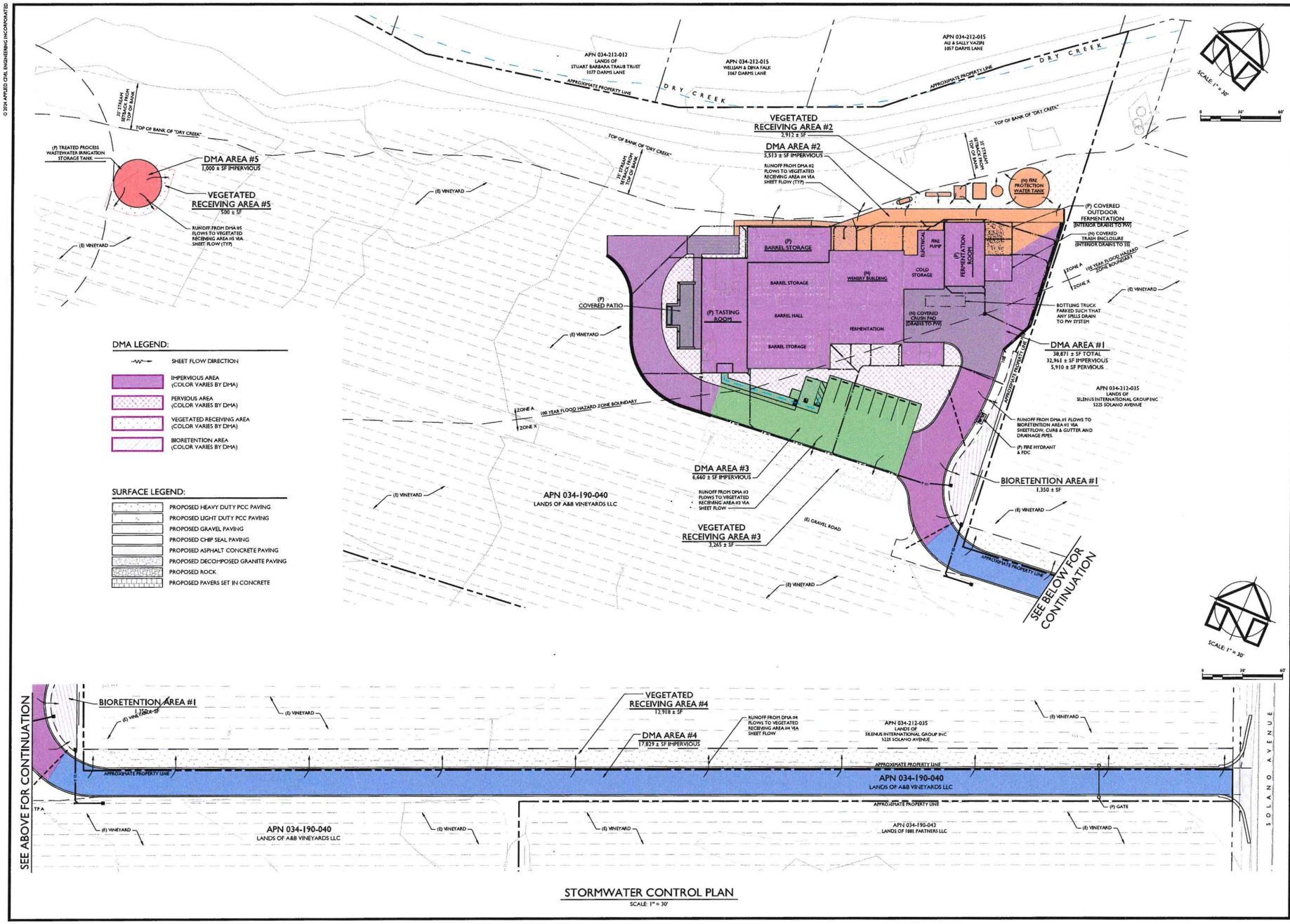
JOB NUMBER: 20-139

FILE: 20-139CONC-GRAD.DWG

ORIGINAL SIZE: 24" X 36"

SHEET NUMBER: C6

OF 8



DMA LEGEND:

- SHEET FLOW DIRECTION
- IMPERVIOUS AREA (COLOR VARIES BY DMA)
- PERVIOUS AREA (COLOR VARIES BY DMA)
- VEGETATED RECEIVING AREA (COLOR VARIES BY DMA)
- BIORETENTION AREA (COLOR VARIES BY DMA)

SURFACE LEGEND:

- PROPOSED HEAVY DUTY PCC PAVING
- PROPOSED LIGHT DUTY PCC PAVING
- PROPOSED GRAVEL PAVING
- PROPOSED CHIP SEAL PAVING
- PROPOSED ASPHALT CONCRETE PAVING
- PROPOSED DECOMPOSED GRANITE PAVING
- PROPOSED ROCK
- PROPOSED PAVERS SET IN CONCRETE

STORMWATER CONTROL PLAN

SCALE: 1" = 30'

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A&B VINEYARDS LLC

USE PERMIT MODIFICATION CONCEPTUAL SITE IMPROVEMENT PLANS
STORMWATER CONTROL PLAN

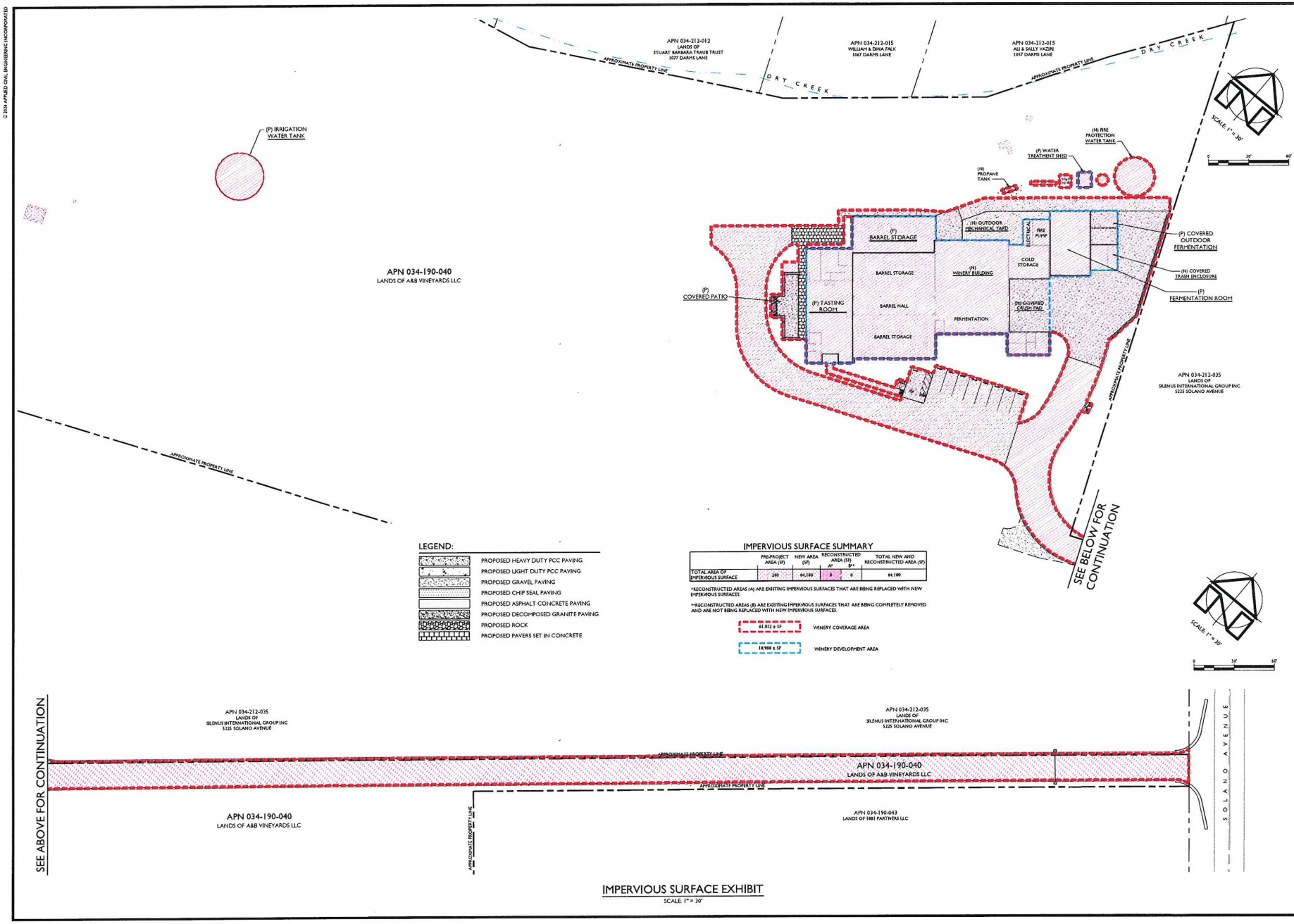
PREPARED UNDER THE DIRECTION OF:

REGISTERED PROFESSIONAL ENGINEER — MICHAEL R. MOHLER — No. 72012 — CIVIL — STATE OF CALIFORNIA — FOR PERMIT AND CONSTRUCTION — NOT FOR CONSTRUCTION

DRAWN BY: PowerCAD LLC
CHECKED BY: MRM
DATE: AUGUST 9, 2024

REVISIONS:	BY:
3/10/2023 PERMIT SUBMITTAL	YMS
⚠1 5/10/2023 PERMIT RESUBMITTAL	YMS
⚠2 9/6/2023 PERMIT RESUBMITTAL	YMS
⚠3 8/9/2024 PERMIT RESUBMITTAL	YMS

JOB NUMBER: 20-139
FILE: 20-139EXH-SCP.DWG
ORIGINAL SIZE: 24" X 36"
SHEET NUMBER: C7
OF 8



LEGEND:

- PROPOSED HEAVY DUTY PCC PAVING
- PROPOSED LIGHT DUTY PCC PAVING
- PROPOSED GRAVEL PAVING
- PROPOSED CHIP SEAL PAVING
- PROPOSED ASPHALT CONCRETE PAVING
- PROPOSED DECOMPOSED GRANITE PAVING
- PROPOSED ROCK
- PROPOSED PAVERS SET IN CONCRETE

IMPERVIOUS SURFACE SUMMARY

	PRE-PROJECT AREA (SF)	NEW AREA (SF)	RECONSTRUCTED AREA (SF) A*	RECONSTRUCTED AREA (SF) B*	TOTAL NEW AND RECONSTRUCTED AREA (SF)
TOTAL AREA OF IMPERVIOUS SURFACE	240	64,100	0	0	64,100

*RECONSTRUCTED AREAS (A) ARE EXISTING IMPERVIOUS SURFACES THAT ARE BEING REPLACED WITH NEW IMPERVIOUS SURFACES.

**RECONSTRUCTED AREAS (B) ARE EXISTING IMPERVIOUS SURFACES THAT ARE BEING COMPLETELY REMOVED AND ARE NOT BEING REPLACED WITH NEW IMPERVIOUS SURFACES.

61,812 ± SF — WINERY COVERAGE AREA

18,988 ± SF — WINERY DEVELOPMENT AREA

IMPERVIOUS SURFACE EXHIBIT

SCALE: 1" = 30'

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A&B VINEYARDS LLC

USE PERMIT MODIFICATION CONCEPTUAL SITE IMPROVEMENT PLANS
IMPERVIOUS SURFACE EXHIBIT

PREPARED UNDER THE DIRECTION OF:

REGISTERED PROFESSIONAL ENGINEER — MARK R. MORRIS — No. 32018 — CIVIL — STATE OF CALIFORNIA
FOR REVIEW ONLY — NOT FOR CONSTRUCTION

DRAWN BY: PowerCAD LLC
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DATE: AUGUST 9, 2024

REVISIONS:	BY:
3/10/2023 PERMIT SUBMITTAL	YMS
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1 9/6/2023 PERMIT RESUBMITTAL	YMS
1 8/9/2024 PERMIT RESUBMITTAL	YMS

JOB NUMBER: 20-139
FILE: 20-139EXH-ISE.DWG
ORIGINAL SIZE: 24" X 36"
SHEET NUMBER: C8
OF 8

Irrigation Storage Tank Water Balance

Month	Beginning Balance	Process Wastewater	Land Application Capacity	Ending Balance
January	29,700	13,500	0	43,200
February	43,200	13,500	0	56,700
March	56,700	13,500	0	70,200
April	70,200	10,800	0	81,000
May	81,000	10,800	65,216	26,584
June	26,584	13,500	163,039	0
July	0	27,000	163,039	0
August	0	48,600	97,823	0
September	0	48,600	97,823	0
October	0	40,500	65,216	0
November	0	16,200	0	16,200
December	16,200	13,500	0	29,700
		270,000	652,155	

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 empy in August, just prior to crush.
4. This table is intended to illustrate waste disposal capability only. Where irrigation demand exceeds availble treated wastewater availability additional irrigation water will be provided by another source.

Winery Process Wastewater Generation Analysis

Annual Wine Production	45,000 gallons
Wastewater Generation Rate	6 gallons per gallon of wine
Annual Wasewater Generation	270,000 gallons
Crush Season Length	45 days
Wastewater Generated During Crush	1.5 gallons per gallon of wine
Peak Wastewater Generation Rate	1,500 gallons per day

Winery Process Wastewater Generation Table			
Month	Percentage of Annual Total	Monthy Flow (gallons)	Average Flow (gpd)
January	5.0%	13,500	435
February	5.0%	13,500	482
March	5.0%	13,500	435
April	4.0%	10,800	360
May	4.0%	10,800	348
June	5.0%	13,500	450
July	10.0%	27,000	871
August	18.0%	48,600	1,568
September	18.0%	48,600	1,620
October	15.0%	40,500	1,306
November	6.0%	16,200	540
December	5.0%	13,500	435
Total	100.0%	270,000	

Notes:

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

Irrigation Schedule Analsysis

Vineyard Information:

Total acres of vines	4 acres
Vine Row Spacing (approx)	7 feet
Vine Spacing (approx)	5 feet (estimated)
Vine density	1,245 vines per acre (estimated)
Total Vine Count	4,978 vines

Irrigation Information:

Seasonal Irrigation[1]	131.0 gallons per vine (May through October)
Non-Irrigation Application	0 inches per month October through April

Irrigation Schedule					
Month	Monthly Percentage[2]	Irrigation per Vine (gallons)	Seasonal Irrigation (gallons)	Non-Seasonal Irrigation Application (gallons)	Total (gallons)
January		0.0	0	0	0
February		0.0	0	0	0
March		0.0	0	0	0
April		0.0	0	0	0
May	10%	13.1	65,216	0	65,216
June	25%	32.8	163,039	0	163,039
July	25%	32.8	163,039	0	163,039
August	15%	19.7	97,823	0	97,823
September	15%	19.7	97,823	0	97,823
October	10%	13.1	65,216	0	65,216
November		0.0	0	0	0
December		0.0	0	0	0
Total	100%	131.0	652,155	0	652,155

Notes:

1. Irrigation per vine is based on 0.5 acre-feet per acre of vines per WAA.
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.