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PRactical WINERY & VINEYARD

JANUARY/FEBRUARY 2005

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VARIETAL REVIEW

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Vineyard soil erosion

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CUVAISON WINERY

Flexibility with movable fermentors and catwalks

BY Matt Hollis,
Taylor Lombardo LLP, Architects

A new Cuvaison Winery facility in the Carneros region of Napa County, CA, presented an opportunity for the design team at Taylor, Lombardo LLP, Architects (San Francisco, CA [formerly Brandenburger, Taylor, Lombardo]), and winemaker Steve Rogstad to collaborate in the creation of a building capable of accommodating multiple phases of the winemaking process within a common space.

The site plan is based on a campus approach, with one rigid frame metal building structure to house all components of wine production and two smaller wood-frame buildings for staff offices and a laboratory. The choice of a metal building for the winery facility was a function of cost and efficiency.

Supplied by Soule Building Systems (Cotati, CA), the rigid frame structure is composed of standardized components within a custom design. A typical

Galvanized metal roof projects over the crush/receiving and press pad (left). Three flush-faced shed dormers above the fermentation floor correspond with the structural bays that support the punchdown system above the rows of open-top fermentors inside. Two ridge-mounted roof monitors allow diffuse ambient light to fall into the center of each barrel room (right).

bay section represents a computer-optimized structural profile maximizing structural efficiency within a

ESTATE SELECTION



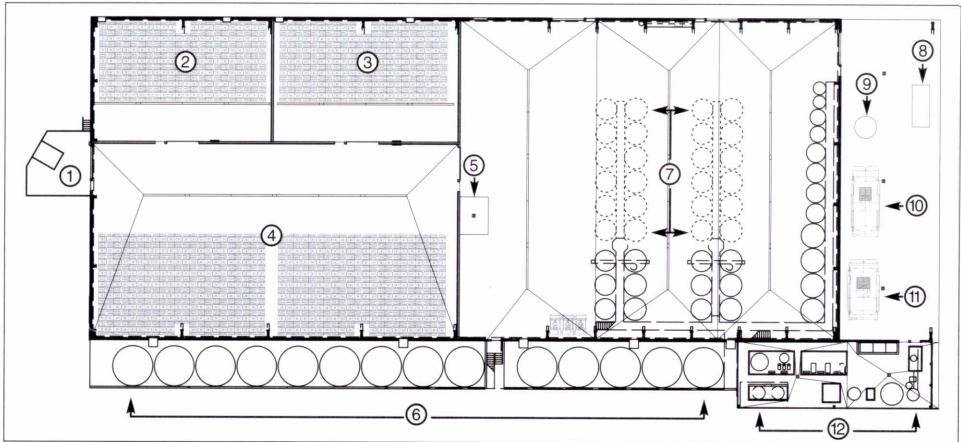
CUVAISON

Located in the center of a 392-acre estate, the 25,000-square-foot metal structure will host no formal tours. Its focus is instead on state-of-the-art features dedicated to producing top quality Pinot Noir and Chardonnay wines.

Sited on a stepped promontory surrounded by picturesque rolling vineyards, the facility's location negates the need to truck fruit from vineyards to a remote winery. Without the variable of time in transport, the winemaker is afforded complete control over temperatures during processing.



Sunlight streaming thru three dormer windows where punch downs range from one to four per day. Once per day during cold soak, three to four per day from the onset of fermentation to -0° Brix then one or none each day during extended maceration.

WINERY DESIGN


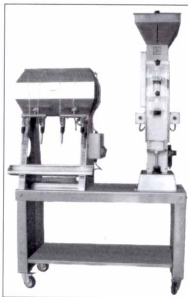
[1] loading dock; [2], [3], [4] barrel storage rooms with individual environmental controls; [5] barrel washing; [6] blending tanks; [7] movable fermentors and catwalks; [8] sorting belt and destemmer; [9] basket press; [10] tank press for whole-cluster white grapes; [11] tank press for whole-cluster white grapes; [12] mechanical equipment including a central glycol system with two storage tanks, one for cold glycol and one for warm glycol

Filling/Corking Machines

Entire unit is portable, with corking machine and model "Tivoli" linear gravity filling machine, with four spouts complete with electronic float.

- **Operation:** Pneumatic
- **Weight:** 72 KG
- **Overall dimensions:** 520x4000x1800 mm
- **Hourly Production:** 500-600/hour

Manufactured entirely in AISI 304 stainless steel. The corking head is equipped with four ground-lapped jaws. Synthetic or natural corks with 22, 24, 26 may be used, and machine can be equipped for corks 28 on request. The cork is inserted rapidly (about 2 seconds), with a corking pin operated by pneumatic piston, to create less pressure on the neck of the bottle. The corking machine hopper is equipped with a mechanical agitator to allow continuous cork feed.



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WINERY DESIGN

minimum number of members. In addition, the rigid frame can be erected more quickly than other forms of construction, cutting costs significantly.

The metal building choice was also desirable from a maintenance perspective. The metal frame was coated with kestrel-blue protective paint to guard

against corrosion normally associated with high humidity or prolonged exposure to sulfur and other chemicals. All exterior and interior walls sit on top of a four-foot concrete stem wall base. The stem wall provides an added measure of durability to protect against damage from errant fork-

lift, scissor-lift, and automobile traffic.

The challenge was to design a building that did not look like a typical metal shed with an undistinguished exterior. The client wanted the winery and office space to fit in the rural location. Unlike many Napa Valley wineries, this building needed to reflect its function and look more like an agricultural barn than eye candy beckoning visitors.

The design team integrated shed dormers, roof monitors, clerestory windows, and other punched-openings to not only bring in an abundance of natural light, but to let the exterior suggest the function of the interior. For instance, the flush-faced shed dormers above the fermentation floor correspond to the structural bays that support the punchdown system above the open-top fermentors. Alternately, the ridge-mounted roof monitors (raised sections on the roof that contain clerestory windows) above the barrel storage rooms have a different appearance altogether as they allow ambient light to fall into the center of each barrel room.

The building style consciously straddles the line between contextually sensitive agricultural vernacular and a modernist high-tech box. The rigid, insulated polyurethane panel exterior walls atop the concrete stem wall are clad with Zaktique-finished corrugated metal sheets. While the corrugated metal recalls innumerable farm building precedents in the area, the Zaktique finish lends a certain slickness that hints at the top quality production facility within.

Because the prevailing design concept was for a production-only facility with little or no hospitality provisions for tours, the design maintains clean lines and a certain freedom from expensive interior finishes that would otherwise be necessary to conceal infrastructure. All plumbing, electrical, refrigeration pipe, and conduit routing are left exposed to maximize accessibility for maintenance and future expansion of the winery.

"The Cuvaison Carneros facility was designed primarily around the requirements of our Pinot Noir pro-

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WINERY DESIGN

gram, yet also to be able to efficiently handle our 180 acres of estate-grown Chardonnay," explains Rogstad. "Since our Pinot Noir all derives from our estate vineyard and comes ripe, more or less at the same time, we don't have the luxury of turning over fermentors two or three times each year as might be the case if our fruit came from different vineyards.

"We also wanted to be able to further divide individual blocks into smaller lots based on other vineyard factors such as vigor, aspect, and sun exposure. We have 36 open-top fermentors (5.4-ton and 6.7-ton capacity) that allow us to pick all of our fruit when and how we want to, without having to wait for open tanks. But to pay for this luxury in floor space, we chose to make 24 tanks portable, along with all of the associated plumbing and catwalk."

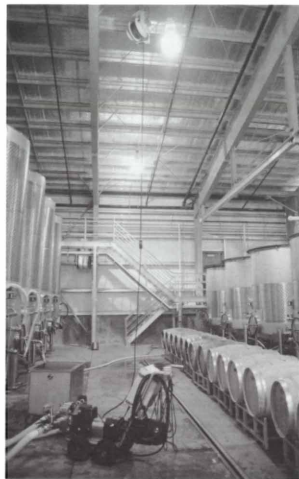
The tanks built by Modern Stainless & Design (Dayton, NV) have high-pres-

sure dimpled glycol jackets and #4 finish polished stainless steel legs. Tank bottoms have a 1/2-inch per foot slope to facilitate removal of fermented grapes.

"By crafting a gangable catwalk system with quick disconnect electrical and glycol fittings, the majority of the tank room can be struck (like a theater set) after harvest, freeing up plenty of floor space for subsequent barrel work and bottling needs."

The fermentation room maximizes use of a ventilated, secure, well-drained space for multiple winemaking functions. Since the fermentation process takes only six weeks, most rooms dedicated to fermentation remain idle for most of the year. The Carneros facility employs movable fermentors and catwalks to create a room with greater flexibility and therefore, more bang for the buck.

When not in use, the tanks are moved by forklift, and the caster-



Barrel working takes place on the floor of the fermentation room. Ceiling-mounted reel provides easily accessible power supply to pump in foreground.

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mounted catwalks are simply pushed by hand to staging areas. Movable catwalks are facilitated by quick-disconnect couplings on the hard-line plumbing that runs underneath the grated walkways. Additional quick-disconnect couplings fasten to flexible tubes which supply tank jackets with both hot and cold glycol.

The final design consists of movable catwalks on casters, gangable in a variety of configurations to make room for other winery processing program components. Electricity is provided by means of a point grid of six ceiling-mounted retractable reels similar to those in an automotive shop. Hose stations are located around the perimeter of the room. Taylormade-brand floor-drains from New Zealand run the length of the tank aisles and generate less impact on forklift traffic trajectory than grated trench drains. Catwalks were oriented so that the aisles have direct access to exterior doors.

"In addition to a flexible floor plan, we wanted accessible services to make both

Push-button heating and cooling control

Fermenter temperature control is key at Cuvaision where cold glycol is used to achieve a 50°F temperature during a five-day cold soak of Merlot, Pinot Noir or Syrah grapes before primary fermentation.

Then after cold soak, warm glycol warms the fermentors to 65°F, and finally cold glycol is used again during primary fermentation to restrain the peak fermentation to 88°F.

To accomplish all this, a central glycol system, designed by Refrigeration Technology (Middletown, CA), makes hot or cold glycol instantly available. It features two storage tanks — one for cold glycol and one for warm — and four pipes (two cold, two hot) running throughout the building.

Having warm glycol available allows Cuvaision to heat the three barrel rooms as needed in the same way fermenter tanks are heated.

The source of the heat is hot water from the central hot water tank. Two loop pumps operate on-demand to heat the glycol, and a load pump supplies warm glycol to the fermenter tanks on a continuous basis. If hot glycol is accidentally pumped into the cold system, no harm is done. The control system detects this, and cold glycol is automatically returned to the warm system.

A valve station was installed for each tank, which allows switching from cooling to heating by opening and closing valves. The system uses RTI Super Stats to monitor the temperature of contents in a tank. The controls change from cooling logic to heating logic with the push of a button. The controls also have high and low temperature alarms to protect the wine.

Cuvaision designed two-thirds of the tanks and catwalks to be movable. This required a series of valves, unions, and quick disconnects for the plumbing and electrical.

repairs and design modifications easier and less costly to achieve," notes Rogstad. "We have hot and cold glycol plumbed all over the winery, for on-demand, simultaneous temperature control and hot and cold water. We also have compressed air and inert gas lines hard-plumbed

throughout. We left much of the plumbing and electrical conduits exposed, but neatly racked for ease of entry.

"The idea of flexibility and impervious structures carried over to other areas

Continued on page 71



Quintessence : The 5th element...

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New Cuvaision facility

Continued from page 61

of the facility, such as the barrel room, where barrels are stacked on movable barrel pallets. This allows us to shuffle fermentation lots through any of three independently controlled environments. Access to the rooms is provided by high-speed fabric roll-up doors. The rooms themselves were designed with enough clearance to accommodate a five-high, tight-pack storage strategy."

Flexibility and mobility can also be observed in the crush pad equipment. A pneumatic bin dumper and incline sorting table/destemmer combination may be readily maneuvered in a variety of configurations inside or out, depending on the crush strategy for a given season. Depending on the weather, crush pad area drains may be switched from accommodating process wastewater to stormwater.

The south exterior facade of the building is dominated by a row of 10 blending tanks — 12 feet in diameter, 17 feet high — with space for seven more tanks. Tank temperature is maintained by means of rigid-insulation cladding. Thus, valuable interior floor space is reserved for the more flexible programs mentioned above.

"Much like the Cuvaision Vineyards Estate-grown wines, we wanted the winery to accent the beauty of the vineyard and not the other way around," adds Rogstad. "An example of this effort was to use a compact, activated sludge system for treating our process wastewater in lieu of a two-and-a-half acre dual wastewater pond. Our 'Techqua' unit spares valuable vineyard acreage and allows us to process up to 10,000 gallons of wastewater per day during harvest, which after treatment, is recycled back onto the vineyard via drip irrigation. The 140,000-gallon fire protection water tank serves a dual purpose by also storing the settled wastewater before its return to the vineyard."

The single-story office and laboratory buildings were kept separate from the 34-foot-tall winery proper in order to humanize the scale of the production facility and take advantage of the gorgeous site. The wood-framed structures reference their much larger metal neighbor with their galvanized metal roofs, yet maintain a sense of individual identity with avocado green stained board-and-

batten siding. The winemaker's office enjoys a catbird seat's view of the entire campus, while other offices and break areas command similar views of surrounding vineyards.

By working in close partnership during the planning phase, winemaker, architect, and general contrac-

tor were able to design/build a winery tailor-made to Cuvaision's needs. ■

TL Design Team: Leta Sterner, Beth Sperry

Architect: Taylor Lombardo LLP

General Contractor: James Nolan

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Civil Engineer: Summit Engineering



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