PRACTICAL Winery & Vineyard JOURNAL

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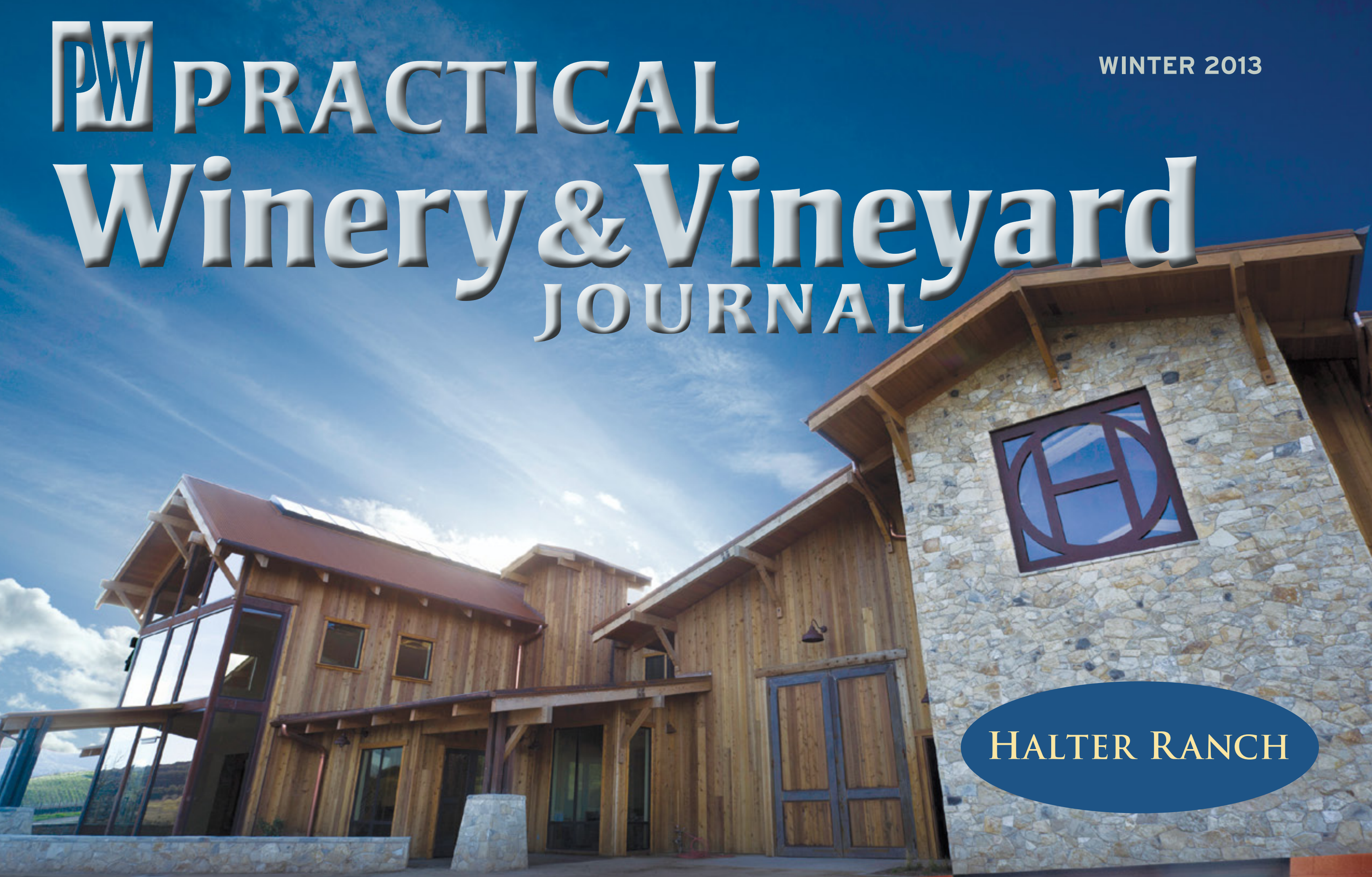

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HALTER RANCH VINEYARD

ORIGINAL DESIGN ELEMENTS OFFER MAXIMUM FLEXIBILITY

BY Bill Sheffer

Receiving hopper and vibrating conveyor can deliver 8 to 10 tons/hour of grape clusters to the Kappa 25 destemmer (right). Grapes are sorted at 2 to 3 tons per hour, and fed to the pod for transport to fermentor (left).

Halter Ranch Vineyard's state-of-the-art winery was designed and built to take advantage of the newest technologies, with efficiency, cleanliness, and maximum flexibility as goals. The 34,000 square foot structure is nestled into one of the original Macgillivray Ranch plantings in the Adelaida Hills west of Paso Robles, CA.

Halter Ranch Vineyard owner Hansjoerg Wyss first came to Paso Robles in 1995, to develop a vineyard on the west side. Wyss became familiar with the 720-acre Macgillivray Ranch that is directly adjacent to Tablas Creek Vineyard, and has the same soils and exposures that brought the Perrin family from Chateauneuf-du-Pape to Paso Robles in the early 1990s.

In 2000, Wyss purchased the Macgillivray Ranch to grow world-class Rhône and Bordeaux varieties. Although there were 40 acres already planted on the ranch when he arrived, Wyss and vineyard manager Mitch Wyss (no relation) began development of what now totals 281 acres of vines.

19 varieties are planted on the ranch: six Rhône red, five Rhône white, five Bordeaux red, Sauvignon Blanc, Petite Sirah, and Tempranillo. With all these different grape varieties, the winery had to be designed for many winemaking techniques and styles. Mostly planted on hillsides, 81 individual vineyard blocks have perfect exposures: south-southwest for red varieties and north-facing slopes for whites.

In April of 2011, Kevin Sass joined Halter Ranch as winemaker. Kevin worked at Justin Vineyard & Winery for 11 years, as winemaker since 2006. Kevin's tenure at Justin is particularly relevant because from 2000 to 2011, Halter Ranch was Justin's largest supplier of purchased fruit. Kevin's familiarity with Halter Ranch's vineyards and fruit has given him a unique ability to hit the ground running. The first 2011 wines that Kevin crafted there have been blended and bottled.

First harvest in the new winery was 2011. Currently the Halter Ranch brand is 8,000 cases (85% red and 15% white wine). The vineyard is capable of producing upwards of 40,000 cases, and the idea is to slowly grow to that production level.

The main facility was designed to be expanded over time, with the majority of the fermentation space built in the initial building construction phase. This includes the permanent tank fermentation area, four above-ground barrel/case goods storage rooms (each 4,500 square feet) for temperature control of white wine fermentation and malolactic fermentation, and new empty barrel storage.

Sorted grapes are dropped from pod into top of tank fermentor.

Mobile Pulsair Tank Mixer on mezzanine level. Winemaker positions the wand through the cap to the tank bottom, injects pulses of filtered compressed air under the cap, and moves the wand to different places under the cap until the must is well-mixed.

In addition, the building houses an indoor barrel working/portable fermentor room, the laboratory, and administration and storage rooms. The expandable portions would be barrel and case goods storage, which include caves and above-ground warehousing, and more space for larger fermentation tanks if needed.

The potential build-out of the facility was limited to a 50,000 case footprint with the idea that the best operational size would be about 38,000 cases (sized for the vineyard output). The footprint will accommodate the larger volume and the initial infrastructure (water, waste water, electrical, plumbing, and mechanical systems) installed initially or built with future expansion in mind.

Energy efficiency above standard

Elements of energy efficiency include concrete catwalks, concrete tank pads, night-air cooling, a CO_2 exhaust system, and skylights. Numerous stone walls are dry-stacked limestone mined from the ranch. A layer of limestone tops most of vineyard blocks at Halter Ranch. When soil is prepped for planting, this layer is broken up and some rock is, by necessity, removed prior to planting.

The 20,000 square feet of permitted caves (2,250 barrel capacity stacked three-high), have been excavated behind the winery and are accessible directly from the barrel-working room [see photo page 10].

The roof is an attractive post and beam construction where the beam expanse is strung with 5x8 clear Douglas fir tongue and groove (T+G) decking. On top of the T+G is oriented strand board plywood (OSB) followed by 2x10s set on edge. This is where many of the utilities are hidden, and the space is filled with bat insulation and covered with a layer of plywood. The roof is finished off with a vapor barrier and sheeted with corrugated Cortin roofing material to give the building a rustic look. This roofing system has a combined insulation value of R-42.

Main processing walls are constructed of an 8-inch concrete masonry unit (CMU block) wainscot to six feet above the floor. Atop the CMU wall area are 4-inch thick poly-

First harvest in the new winery was 2011, and the facility can slowly grow to match vineyard capability up to 40,000 cases.

urethane panels on the interior and 2x6 studs on the exterior. The stud framing goes from the finished floor to the roof and contains R-19 insulation. The interior of the 4-inch panels is clad with corrugated galvanized sheeting and the block is coated with filler and epoxy, giving the interior corrosion and impact resistance.

Additionally, the exterior is covered with 1x12 cedar siding for architectural appeal. The perimeter wall system for the processing areas has a combined insulation value of R-53.

Warehouse walls are constructed of 12-inch CMU walls and coated on the interior with epoxy for impact resistance and humidity retention. The exterior of the CMU has 2x furring strips (creating an air space), covered with 1x12 cedar siding for architectural appeal. The warehouse perimeter wall system has a combined insulation value of R-50.

Added energy efficiencies are gained by the design. A choice was made to divide the warehousing space into four individual rooms separated by a forklift turning aisle and rolling/hanging insulated doors [see photo page 7]. At any given time, only one-quarter of the warehouse is exposed to the differential temperature of the cellar floor. The rooms can be climate-controlled independently, giving winemaking flexibility without subjecting the entire warehouse to seasonal needs for higher or lower temperatures.

An indoor barrel working area was another energy saving decision that many wineries either cannot afford or do not have the space to accommodate. Energy advantages are related to the high diurnal temperature in the Paso Robles area. Summer can have morning lows of 50°F rising to 105°F by 4 PM, making open roll-up doors to 58°F barrel rooms or the cave very inefficient. Also, the indoor environment added to employee comfort for both high and low extremes.

The indoor barrel working area was designed for easy barrel placement, mess containment, and minimal forklift movement. The idea was to layout barrels and do all activities (empty, wash, refill) in place, minimizing the number of forklift trips. Four strip drains are in the floor so that the barrel racks can be placed over a floor drain to contain the mess that occurs when cleaning barrels. The mess stays under the barrels and is not tracked around by the cellar crew while they work. A quick rinse-down before barrels are moved ensures the forklift route and barrel rooms stay clean.

All utilities for barrel working equipment were placed on the opposite wall from the forklift entry to allow movement down any aisle without disturbing any other aisle. This gives a continuous flow of barrel working activity without stoppage to move hoses, electrical cords, and equipment.

Hot (180°F) water is provided at the utility wall to support an AquaTools barrel-cleaning system and the fill hose for the ARS steam generating unit. A portable McClain Ozone Bugbuster unit is also along the utility wall, where it gets cold water and power.

To optimize heating energy efficiency, ensure a safer work environment, and provide hotter water only where and when needed for barrel cleaning, 180°F H_2O is produced by pulling from the 140°F standard plant system and then boosted to 180°F with a second boiler system. This boost system only runs when activated to wash barrels, and is only plumbed to the barrel washing utility wall.

Another component in the barrel working area is the positioning of two nitrogen hose reels that drop from the ceiling to provide nitrogen for a Racketeer debarreling wand. This helps keep the floor free of hose congestion and allows the forklift unencumbered movement.

CO_2 removal and night air cooling systems

The CO_2 removal and night air cooling systems were designed as a dual function system. Natural cooling of the building is achieved with louvers in the cupolas (located in the ceiling) coordinating

The laboratory is 420 square feet with cream-colored Caesar Stone countertops.

Dumping white whole clusters through the hopper into Diemme Velvet membrane press.

with the exhaust fans. The diurnal swing decreases temperatures (at night), down to the low 50s. As the outside temperature falls below inside temperature, the louvers open and the exhaust fans turn on, drawing outside air to cool the building.

During the fermentation season, CO_2 monitoring equipment automatically activates fans in particular zones throughout the winery, to remove dangerous levels

Halter Ranch has two Diemme "Vintage 12" basket presses for small red grape lots requiring careful pressing.

of CO_2 to the exterior of the building. In the barrel and case goods rooms, this is accomplished by wall-mounted fans set low to the floor that suck the gas to the exterior, while dampers in the ceiling open to allow fresh air in to replace the evacuating gas.

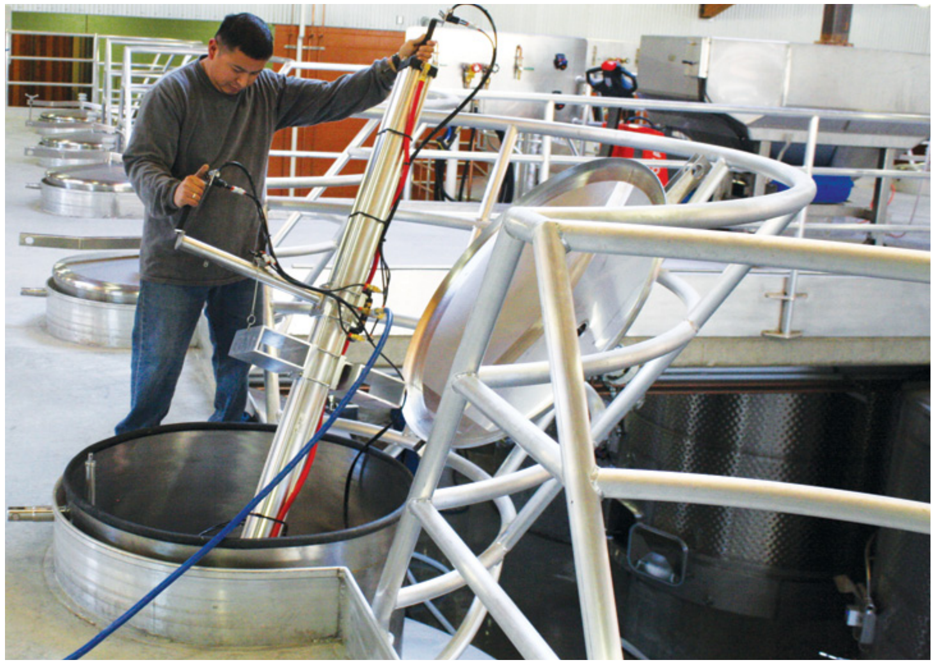
In an effort to minimize exhaust fan use and accompanying noise, maximize energy efficiency and usable floor space, and protect the architectural esthetics of the main facility, the decision was made not to use floor-mounted, boxy/ugly fans in view of the public. Corbett Wulfing (Project Manager), designed the CO_2 removal system for the fixed and portable fermentation tank area to remove CO_2 by means of gravity. Although the same principle applies in the barrel working area and main fermentation room for CO_2 removal, those exhaust fans were installed 120 feet from the winery in a decorative retaining wall [see photo page 9].

Four CO_2 sensors are located on tanks at all four corners of the tank grid in the main fermentation area. There is one CO_2 sensor in the barrel working area, which during harvest is used as a fermentation room with small fermentation tanks.

There are two exhaust areas in the main fermentation room underneath two tanks. CO_2 sinks/enters the below-ground cavity and an exhaust fan outside the building vents the CO_2 through a 24-inch-diameter duct into the vineyard in front of the winery. A third exhaust fan draws CO_2 from the barrel working area and vents to a similar outlet. A CO_2 sensor and exhaust fan in each of the four barrel cells is controlled individually.

Gravity flow for fruit processing

The facility is positioned against a hill and set in the vineyard for both beauty and function. A winemaking requirement was to process fruit using gravity as much as possible and to avoid pumping the must. The back of the winery where the grapes are received and weighed is 20 feet above the cellar floor. This upper

A portable pneumatic punchdown device attaches to bars on the upper manway turret, keeping the gimbal from rising while the foot of the device presses down on the cap.

level is accessed by a utility road that circles the building, allowing the efficient ingress and egress of fruit from the vineyard.

After weighing, the fruit can either be put into a cold storage room or processed immediately. The cold room can hold up to 50 half-ton bins and be chilled to 32°F.

The benefits of a cold storage room are many. If the day is hot, fruit can be stored in a colder environment. Because there is no opportunity to chill must in a gravity system, the room can be used to chill fruit more quickly than in a tank. Also, if there is more fruit picked on one day than can be easily handled, or if mechanical problems arise with processing equipment, some or all of the grapes can be handled on the next day, balancing out production flow.

Multiple levels

Three levels were established to move fruit though the system of cluster-sort, destem/grape-sort, and fruit transport to the fermentation tanks. At the upper level where fruit is received, a forklift dumps half-ton bins into a Burgstahler receiving hopper and onto a sorting conveyor [see photo page 1]. Clusters are inspected on this vibrating sorting conveyor, where they are then transported and dropped into the Kappa 25 destemmer on the second level.

The front end of the fruit processing system, which includes a receiving hopper and delivery chute, can deliver 8 to 10 tons/hour of grape clusters to the destemmer. For effective sorting, the cluster-sort table will need to run no more than 6 to 8 tons/hour with a current operating speed of 2 to 3 tons/hour. The Kappa 25 destemmer is capable of processing 20+ tons per hour. The slow link is the grape sorting table, which effectively sorts at 2 to 3 tons per hour, with a maximum throughput of 4 to 5 tons per hour.

After the fruit passes through the destemmer, the berries are removed and fall onto a vibrating/post-sorting table (see photo, page 1). Berries spread out over the vibrating table, where MOG is removed, and proceed to the transport pod sitting on the third level in the gravity system. Stems go out the end of the destemmer and fall through a hole in the second level deck into a dump truck positioned on the ground floor for removal.

Two pods for fruit transfer

The third level (called the mezzanine) is the same height as the opening on the top of the tanks in the fermentation area. The mezzanine floor is six feet below the exiting end of the post-sorting table on the second level. This allows ample space for a holding vessel (pod) to be positioned to receive sorted grapes. The pod is a custom-made 450-gallon open top stainless steel bin on four wheels with a truncated bottom to a 12-inch pneumatic knife gate valve [see photo page 2].

A 5-gallon pressure tank on the pod allows as many as three opening and closings of the knife gate without recharging. During normal operations, the pod is positioned under the sorting table and is plugged into the compressed air system each time while it sits during filling.

Two pods can each hold 1.5 tons of sorted grapes. While one pod is being filled, the full pod is transported to a tank from the sorting table. It is powered by an electric pallet jack, but could be uncoupled and moved by hand (with less fruit) if needed.

It takes less than 30 seconds to empty the 1.5 tons of must into the tank, with a round trip from sorting table to tank and back again in under four minutes. The pod system is capable of handling 15 tons per hour, but the maximum intent is to crush eight tons per hour, leaving ample time for the operator to transport the must.

Because the winery's current processing needs do not require speeds greater than 2 – 3 tons/hour and because of the rapidly changing technology in grape sorting systems, the Burgstahler grape sorting table was chosen and purchase of a faster grape sorting system was deferred for when production needs demand it and the technology has evolved further.

Concrete mezzanine to hold pods

The mezzanine itself is a catwalk constructed of concrete. It is open to the cellar floor with an aluminum hand railing and toe kicks, but the base is made of formed concrete with area drains instead of the usual expanded aluminum decking.

The concrete construction was built to support the weight of heavy equipment (1.5 tons of fruit in a pod being pulled around by an electric pallet jack) and to freely transport those things needed at the top of the tanks. Forklift gates are placed at the different levels and strategic locations to aid in the placement of equipment, pallets or half-ton bin as needed throughout operations.

The reason for the 60° angle of the hand railing [see photo page 5] is two-fold. The first is to facilitate the mobile pneumatic ram that pivots in the manway tank opening for punch down [see photo page 5].

Because the mezzanine only covers half the tank top and the hand rails would cut across the center of the manway, it was necessary to provide space for the pneumatic piston at every position in the rotation. The second reason was to give room for the must pod to access the proper position to dump fruit into the tank.

Equipment/layout to satisfy multiple winemaking styles

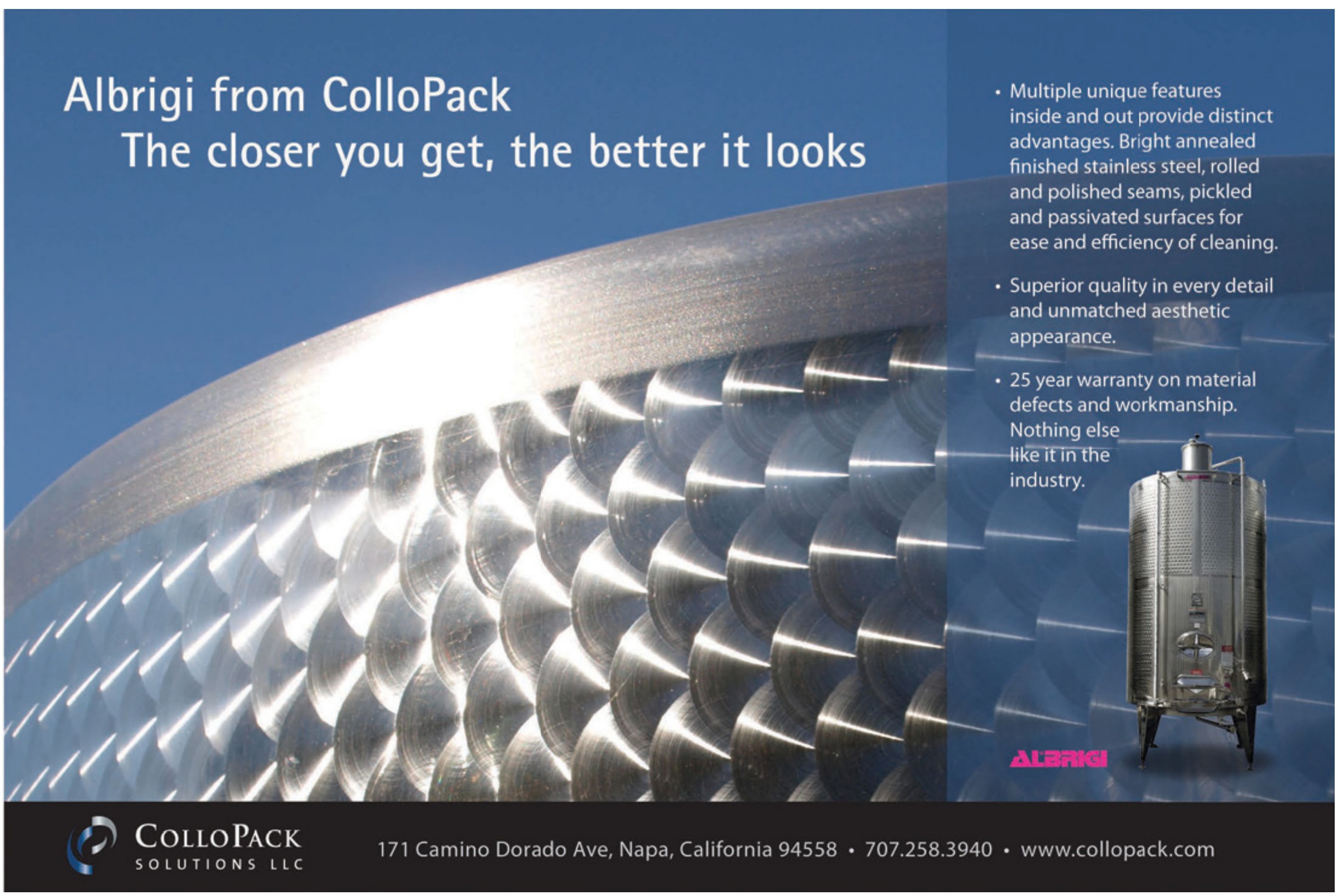
Consideration of multiple winemaking techniques was a high priority with 19 different varieties, each requiring different winemaking methods to maximize varietal qualities.

White Fruit Processing — There are many options when it comes to white fruit processing. A Diemme Velvet 80 (80 hectoliter bladder press, maximum capacity six tons whole cluster) is on the ground floor [see photo page 4], 20 feet below the grape receiving area. The press is elevated four feet off the cellar floor to accommodate $1/2$-ton bins to aid pomace removal.

There is a permanent receiving hopper attached above the press frame to receive large lots of fermented red grapes from the cellar floor.

A second movable hopper is mounted on a rail above the permanent hopper to receive white whole clusters dumped from the upper deck.

White grape options are many: dump whole clusters directly into the bladder press from the grape receiving area; sort by dumping whole clusters onto a pre-sorting table set over the upper hopper; destem/sort into bins, then load into the press from cellar floor; and final destem/sort/dump into tanks for a cold soak, then drain, shovel into bins, and forklift into the permanent hopper above the press.



Red Fruit Processing — Multiple methods of cap management were either installed initially, or the infrastructure will allow easy installation if required in the future.

Pump-over, punch-down, portable Pulsair — The standard pump-over (PO) technique is a mobile/manual procedure before a more permanent system is installed. Typical pump-over can be performed by pumping from the tank-bottom racking valve using a positive displacement pump going through a hose passed to the top of the tank, where it is connected to a Toad irrigator. If pump-over becomes the dominant cap management method, then permanent lines, pumps, seed screens, and automatic IT controls can be installed.

A punch-down (PD) system was designed for the permanent 10-ton and 5-ton upright fermentation tanks. Chris Randell was employed to engineer a pneumatic PD device that would be portable and attach to bars welded into the upper manway turret [see photo page 5].

Mounted three quarters of the way down the 6-foot-long pneumatic cylinder is a gimbal which has pneumatic pancake cylinders that lock the unit into position for PD. This keeps the unit from rising while the PD foot presses on the cap. The gimbal allows the cylinder to pivot 360° so that the PD foot can reach all areas of the cap.

Once the PD unit is locked into place, the operator holds onto the cylinder handles and presses pneumatic valves, raising and lowering the PD foot while pivoting the cylinder in the desired direction. After PD of a red fermentor is complete, the unit is unlocked from the mounting bars in the tank manway and moved to another tank, where the process is repeated.

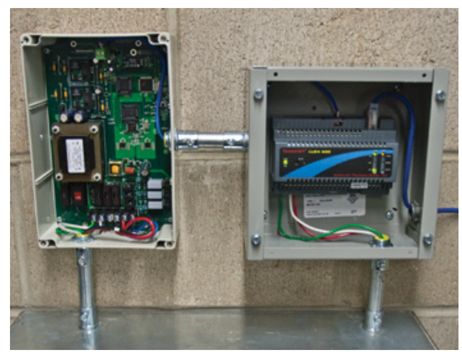
A mobile Pulsair system can be moved among tanks on the mezzanine [see photo page 2]. The operator positions the Pulsair unit close to the tank manway and connects a $5/8$-inch air hose feed to the Pulsair cart containing a 60-gallon air tank with Pulsair filters and delivery system.

Tanks on concrete pedestals, with access to hot water, cold water, nitrogen, and compressed air. The tanks are "skirted" – welded to cover the gap between the bottom of the tank and concrete, so no water can get underneath the tank when cleaning or spraying down the outside.

Easy removal of barrels from storage cell (left) to indoor barrel working area (left, background). Two reels drop nitrogen hoses from the ceiling (right) to provide nitrogen for a Racketeer debarreling wand, keeping the floor free of hose congestion for unencumbered activity.

Halter Ranch TankNET® system

Left: TankNET® thermostat on fermenter provides automatic heating and cooling, brix entry and networking over 115VAC power to TankNET® browser/smart phone accessible control software. In addition, seamless integration between TankNET® and VinX2 production software gives a comprehensive view of winemaking process. **Middle:** Flomax 2-way and 3-way motorized ball valves provide reliable hot/cold flow, simplified plumbing and visual position indication. **Right:** TankNET® router at breaker panel provides communications link between 115VAC tank power and winery network.



From the cart, a 1-inch hose attached to a 1-inch-diameter stainless steel wand is inserted through the cap from the top manway.

After the operator positions the wand through the cap to the tank bottom, the Pulsair is started to inject pulses of filtered compressed air under the cap, producing an impressive eruption. Move the wand into different places under the cap and the must is well-mixed. After the tank is mixed, the unit is moved to another tank and the process repeated.

Drain reds over screen, shovel to bins — When the red fermentation/skin contact is complete, the tank is drained of free run over a screen set in a sump, the bottom manway door is opened, and the pomace is shoveled into half-ton bins. The pomace is then transported by forklift to either the larger bladder press to be combined with other tanks for large lot press fractions, or it is dumped in the smaller basket press cage for small lot separation.

Pressing options

There are great advantages to having options to choose from when it comes to pressing of fermented grapes.

Large lots to bladder press — The Diemme Velvet 80 bladder can press upwards of 20 tons/load of drained red pomace, giving the winery the advantage of combining like lots together for a more efficient production flow.

Small, high-quality lots to basket presses — Two Diemme Vintage 12 basket presses receive small lots and lots requiring more care in pressing. The press holds 2.5 to 3 tons of drained red pomace with no minimum volume requirements, allowing the pressing of very small amounts if needed.

Two presses holding 2.5 tons plus an additional basket were chosen over one 5-ton press with an extra basket for several reasons. First, Halter Ranch has many small vineyard blocks requiring small lot fermentation, and having two presses allows for more effective separation of wine lots. Second, efficiencies are gained with the smaller baskets — they drain faster and have a higher final yield in less time than a larger one.

Granted, there are more movements with smaller baskets, but the right flow and rotation along with the quick drain/press time offset the extra movements.

Also, larger baskets require a forklift capacity greater than 6,000 lbs that Halter Ranch does not have. The small 5,000-lb warehouse forklift is less expensive and easier to operate in the winery environment.

Other infrastructure innovations

Hot and cold glycol throughout facility — The winery was set up with

Smart Fog ES100-2 Non-Wetting Humidifier (part of the ES100 Humidification System), assures 75% humidity when wine barrels are in any of four storage rooms. When case goods are stored in a storage room, the humidifier is adjusted to 50% humidity.

both hot and cold glycol systems to handle fermentation needs, climate control in barrel and case goods storage areas, and administration heating and air conditioning. Each tank and individual environmental area has its own climate control to adjust temperature as needed. All individual controls interact to one of two main IT software systems.

The tanks are controlled by a TankNET system that includes an individual controller at each tank, networked to the winery's IT system. TankNET controllers can be monitored, adjusted, or used as a point of data input at the individual tanks, on any computer throughout the winery, or remotely via the Internet (page 8).

Heating on bottom tank jacket only, cooling on top jacket — Each tank can be heated or cooled with the simple push of a button. High and low set-points are entered into the TankNET controller and adjusted as needed. When cooling is applied, the top and bottom jackets receive cold glycol, but when heating is needed only the bottom jacket is used.

Permanent upright fermentation tanks include 24 ten-ton tanks (12 in the first bay, 12 in a third bay), and 12 five-ton tanks (in the middle bay). Portable fermentation tanks in the barrel working area during harvest include 4 four-ton tanks, 4 three-ton tanks, 2 two-ton tanks, and 3 one-ton tanks.

Reduced water use and reuse (mess containment) — Cleanup ease and water conservation were important considerations in the winery design, to be sure that messes are contained and easily cleaned up while using minimal water. The waste water is treated and reused in the vineyard.

The concrete mezzanine has an uninterrupted aluminum toe kick that prevents water or messes from falling on top of the tanks or to the floor below. The mezzanine has a sloped concrete floor to area drains for fast, easy cleaning. The portion of the mezzanine that has fruit processing, and the two levels above, have ACO trench drains for fast cleanup.

Tanks on concrete pedestals — The tanks are placed on concrete pedestals instead of on tank stands. The pedestal gives added floor space while containing spills to the front of the tanks. ACO trench drains were installed in all tank aisles instead of area drains, for ease and speed of cleaning [see photo page 7].

Floor slope and trench drains — All the floors throughout the winery have a minimum slope of 2% to ensure that the heavier particles can be easily moved to the drains with little effort and water. Sloped floors are more likely finished correctly by concrete contractors without areas that can puddle up (called "bird baths"). When the floors drain completely, they dry up quickly, leaving less chance for growth of mold and bacteria.

Water/waste water — The water for winery operations, office bathrooms, laboratory, and mechanical equipment is supplied from a well on the property. The water, although acceptable for vineyard irrigation, was deemed too high in dissolved solids to be suitable for long-term use

CO_2 sinks/enters the below-ground cavity under tanks (left), and an exhaust fan outside the building vents the CO_2 coming out through ducts (right) into the vineyard in front of the winery.

on plumbing and mechanical equipment (boilers and glycol chillers) and unacceptable for addition to wine or winery cleaning. In addition, for equipment warranties to be honored, the water hardness needed to be 150 ppm dissolved solids or less.

To solve the water quality problem, a reverse osmosis (RO) unit was installed to produce 7,000 gallons/day, filling two 7,000-gallon tanks that are treated with ozone. This leaves a reserve of 14,000 gallons of treated water to satisfy an estimated daily use of 2,000 gallons/day at harvest time with a possible peak day use of 7,000 gallons.

The installation of an RO unit raised a dilemma between wanting to reduce water use and the amount of excess water needed to run an RO system. This dilemma was bridged by taking the waste side of the treatment system and diverting it to the waste water recovery/treatment system of the winery for reuse in the vineyard. In this way, the winery does use more water, but the net use between the winery and vineyard is unchanged.

Waste water solids removal/aerated ponds/water re-use — The processed waste water goes through a FlexRake screen to remove solids, and is then pH-adjusted before gravity flow to the two-stage aerated ponds. Waste water enters the first pond where it is automatically monitored for dissolved oxygen (DO) and aerated with brush aerators before moving to the second pond, where it is held before transfer to an irrigation pond.

Rain water recovery — The final effort of a water-responsible design is to install a rain water recovery system. The water from the winery roof is diverted to a sump, then pumped to the vineyard irrigation pond.

The collective area of the roof is about one acre and the average annual rainfall is 25 inches (2 acre feet/year, 651,702 gallons, or 1,800 gallons/day). The system will recover about the same amount of water that the winery is estimated to use at full production.

Esthetic design: Form and function

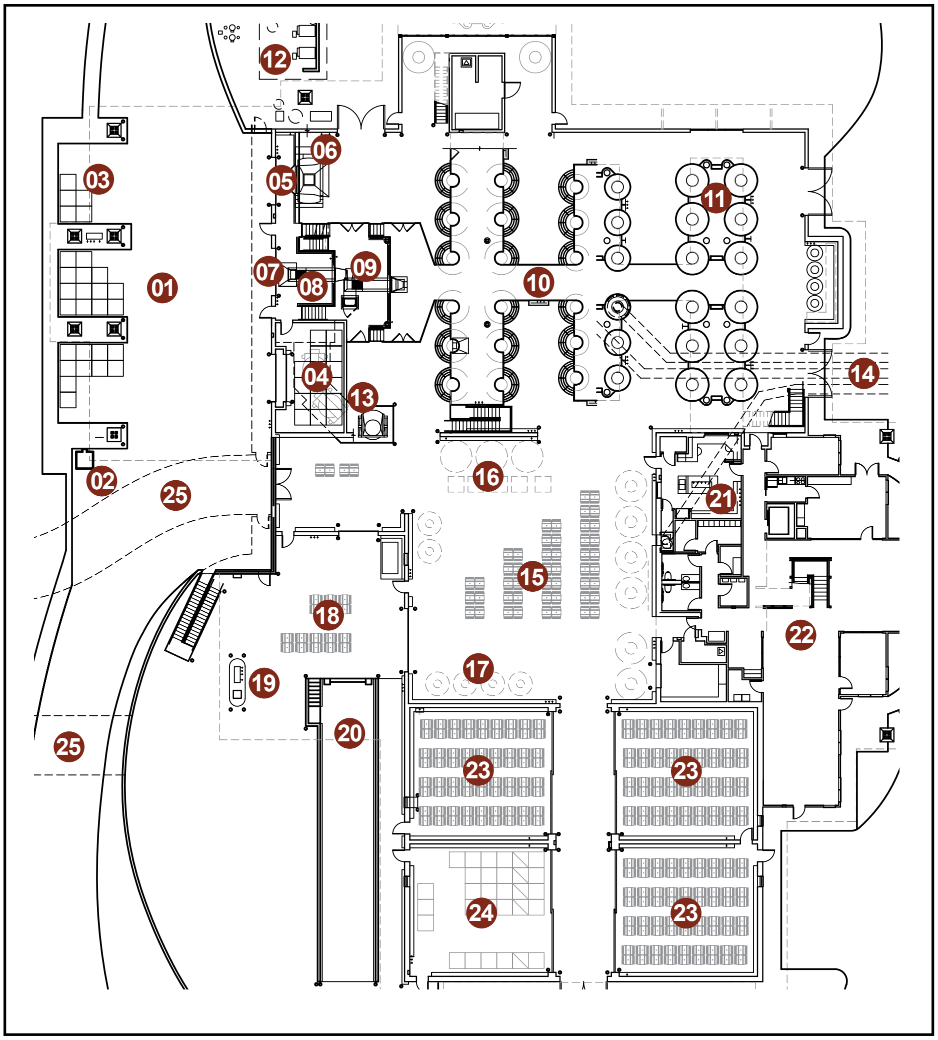
Windows, glass roll-up doors, skylights — A lot of glass was incorporated into the architectural design for both form and function. As you drive up to the winery, you immediately see the stunning glass entryway that stands two stories high. The glass panels in the administration area are dual glazed, low emissivity (low E) glass, which reduces solar heat gain. The windows and skylights give lots of natural light, which increases employee productivity and mood, also reducing the need for artificial light and effectively lowering energy consumption.

Large walls of windows on the east side of the winery look into the tank fermentation area, and another large glass wall is at the main entrance. Inside the main entrance is a row of

The cave is 15 feet wide with an eleven-feet ceiling and has two potential entertainment areas (19 feet wide with 14-feet ceiling). Floor has a 2% slope for drainage. A sprayed-on impervious layer sandwiched between seven- and nine-inch thick shotcrete layers acts as a water seepage system for the walls and ceiling. The cave was constructed through wet-squeezing clay by Nordby Wine Caves (Santa Rosa, CA). Monitoring systems were employed during excavation to monitor movement due to expansive soils. There are two external and one internal (shown) access portals.

OnSite N-50 Pressure Swing Adsorption (PSA) Nitrogen Gas Generator system is plumbed to all water utility stations throughout the winery. This provides nitrogen to push wine in transfer pipes, sparge tanks, do inert transfers, and enable barrel pressurization for debarreling and bottling support. The unit can support a debarreling rate of 225 liters per minute at 12 psi or a bottling speed to sparge 50 bottles per minute at 25 psi. Debarreling utilizes a purity of 99.5% N_2 while bottling requires 99.95% N_2 purity.

The roof is post-and-beam construction with tongue-and-groove decking, and combined insulation value of R-42. Skylights for natural lighting are set between cupolas that assist night cooling.



Halter Ranch site plan by Corbett Wolfing, Design+Build Collaborative, Paso Robles, CA

- 01 Fruit Reception
- 02 Scale
- 03 Macro-bin Staging Area
- 04 Macro-bin Cold Storage
- 05 White Fruit Processing Deck/Hopper
- 06 Bladder Press
- 07 Red Fruit Processing Deck/Hopper/ Dump Trailer Beneath
- 08 Cluster Sorting Table
- 09 Destemmer Deck/Berry Sorting Table
- 10 Tank Deck
- 11 Tank Cluster Pad
- 12 Mechanical Yard
- 13 Basket Press Pad
- 14 Gravity CO_2 Removal Drain/ Night Cooling Duct
- 15 Indoor Barrel Washing Area
- 16 Mobile Tank Area
- 17 Bottling Tanks
- 18 Outdoor Barrel Washing Area
- 19 Mobile Bottling Line Utility Island
- 20 Truck Dock
- 21 Lab
- 22 Administration Area – VIP Lounge Above
- 23 Barrel Storage Cells
- 24 Case Goods Storage Cell
- 25 Barrel Storage Tunnels

skylights at the top of the vaulted ceiling. The permanent fermentation room has skylights between the cupolas that let in night cooling air. The barrel working area has four skylights, and the forklift aisle separating the four cells for barrels or case goods has two skylights. There are three large roll-up doors at the grape receiving entrance. ■

__Bill Sheffer__ has worked in the wine business for 30+ years, mostly holding winemaking positions after receiving a degree in production operation management from Cal Poly, San Luis Obispo, CA. He started as a cellar hand at the former Estrella River Winery (Paso Robles, CA), moving into an assistant winemaking position six years later for John Munch at Adelaida Cellars (Paso Robles). Sheffer has held assistant or head winemaking positions at 13 wineries, in four countries (36 vintages), and participated in numerous winery expansions and five new winery startups.

In 2006, Hansjoerg Wyss hired Sheffer to make Halter Ranch wines, and achieve a winemaker's dream: the opportunity to take many ideas from his career and build them into the new Halter Ranch facility. With Sheffer, Wyss, and dedicated individuals on the Halter Ranch winery design and construction team, the project has become a reality.

Sheffer left Halter Ranch in order to repeat this dream, traveling with the vintages in both the Northern and Southern hemispheres, consulting on new winery construction and expansions.

__Corbett Wulfing__ was Project Manager and Construction Manager for JRM Development architect John Mitchell who designed the Halter Ranch Winery building. Wulfing contributed his expertise in winery planning, process flow, design, and construction of the Halter Ranch winery. Today, Wulfing is a Master Builder with Design+Build Collaborative, Paso Robles, CA.