WINES & VINES

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Does Greatness Trump Greenness?

How vintners and architects prioritize wine quality in new winery construction

by Paul Franson

Gravity-flow fermentation tanks are used in the To Kalon addition to Robert Mondavi Winery. The use of gravity flow is a hot topic in the construction of new and expanding wineries.
PHOTO: Ron Dun/BAR Architects

Though the buzz at new wineries continues to be about "green" operations and dramatic looks, most startup facilities still design their properties to make the best wine. The ways they achieve these results, however, remain as diverse as the wines themselves.

Most new wineries are adopting at least some gravity flow--probably the biggest trend in winery design. Ironically, such sloping construction was a necessity before electricity made pumps practical, and now some wineries would prefer to dispense with the energy required to operate the pumps while improving their wines.

Most architects involved in winery design say their clients want wine to flow naturally--or the architects suggest it to them. John Hall of Hall and Bartley Architects in Santa Rosa, Calif., says that some wineries seem more interested in gravity flow than others. "Pinot Noir producers are especially concerned," he notes.

Winery architect Laurence Ferar of Portland, Ore., agrees. "Some Pinot Noir producers think gravity feed is the be all and end all."
Still, the most important factors in wine quality remain sanitation and temperature control, and those factors have gained increasing importance with some popular artisanal winemaking techniques.

Giving gravity a boost

Wineries built on hillsides--or containing deep cellars--are the easiest places to implement gravity flow, but most wineries have to depend on mechanical means to accomplish this goal. The simplest is undoubtedly a forklift raising and dumping bins into crushers, destemmers or even presses. "You can do a lot with a forklift," Ferar notes.

Many wineries now use conveyor belts, but even those are suspect at Stratus Winery in Ontario, Canada, where winemaker J.L. Groux fears they can harbor and transport contaminants. Unless the crushers are on a level above the fermentation vats, pumps remain most popular and are certainly widely used for must. Some smaller operations press into mobile tanks that can be lifted above tanks for gravity flow, however.

In the Napa Valley, Palmaz Vineyards has its crusher above a giant underground carousel that rotates tanks and moves juice between floors in a special elevator--as does Vineyard 29. Opus One moves the crushers around on a floor above tanks for direct deposit into the fermentation tanks.

The Lange Twins in Lodi, Calif., even built a ramp that allows trucks to unload their bins above the crushers--they use the area underneath for barrel storage.

A system of winches and pulleys at Stoutridge Winery in Marlboro, N.Y., adds gravity flow and helps owner and winemaker Steve Osborne avoid the use of pumps.

Jeff Goodwin of BAR Architecture in San Francisco says his firm has suggested and implemented gravity flow at wineries such as the To Kalon addition to Robert Mondavi Winery. There, the grapes are crushed and pressed over the fermenters from half-ton bins. "Most of our wineries now have elevators for raising grapes for crushing and pressing," he says.

At Stoutridge Winery in New York, owner and winemaker Steve Osborne created a system of winches and pulleys to help him add gravity flow and avoid pumps, though the winery is built into a hillside.

For more information on gravity-flow wineries, see a feature on winery architecture in the Northwest (Wines & Vines, *November 2006, "Pumping Pinot Noir").*

Sanitation is increasingly critical

After a period in which some boutique winemakers complained that universities were overly concerned with sanitation, the pendulum may be swinging back in that direction. Many artisan winemakers prefer uninoculated wines and high-pH musts that are especially susceptible to contamination from Brettanomyces yeasts and VA bacteria. Consumers also are demanding organic wines and others containing minimal additives including sulfur dioxide. This means increasing pressure for impeccable winery hygiene.

Trinchero Estate Winery scrutinized grout when choosing porcelain and concrete flooring for areas such as the fermentation room (above). Jeff Goodwin of BAR Architects said his goal was to avoid mold in the facility.
PHOTO: Ron Dun/BAR Architects

Goodwin, the San Francisco architect, notes that interior details are important for sanitation. "It needs to be easy to clean--reduce the areas where dirt and mold can collect, and make sure there are no cracks and crevices to host mold." He says that most production floors are concrete for this reason. At the new Trinchero Estate Winery, the floor is porcelain and concrete, but Goodwin says particular attention was paid to the grout to avoid mold.

He's also cautious about epoxy, as many types are relatively new and untested over long periods, and some give off gas that contains volatile organic contaminants.

Stoutridge's Osborne ferments in stainless steel or plastic and uses large, 750-gallon oval-shaped oak barrels for aging the delicate wines he makes. The ovals have doors he can squeeze through to clean, using minimal hot water and no chemicals. "I just scrub them down," he says. He intends to install an ozone generator to further help with cleaning, again avoiding harsh persistent chemicals including chlorides and bromides that can encourage development of TCA and TBA (tri-chloro-anisole and tri-chloro-bromide) contaminants.

Susan McNabb, a senior associate at Mithun Architects + Designers + Planners in Seattle, was project manager for the Novelty Hill-Januik Winery facility recently completed in Woodinville, Wash. "Every detail is important," she says.

They chose concrete interiors and exteriors for the building. "It's durable and was fabricated as large, tilt-up panels that can be easily kept clean. Mold and bacteria don't grow on it, and there are few joints where it can hide," she says. "We wanted the production area to be functional and efficient. After all, it is a factory for

making wine."

All the paints and solvents in the facility emit low volatile organic compounds (VOCs), too, and they avoided using absorptive materials in construction.

Many wineries are built of inert materials such as concrete and steel, rather than the wood and stone many would consider more attractive but which are also more troublesome from some respects. Richard and Alis Arrowood's new Amapola Creek Winery in Sonoma Valley is a heavily insulated metal building. "There's no wood exposed in it except barrels," Arrowood notes. It does have two massive redwood doors, but they're heavily sealed.

Arrowood uses ozone for cleaning, and the winery is small enough that no hoses have to be more than 10 feet long for thorough cleaning. "It's a lot easier to be sustainable in a small winery than a big one," he says, noting that he'll only make 3,000 cases per year.

Arrowood has adopted other green practices, too, including solar power, COOF certification for its vineyard, gray water recycling for landscaping and composting of pomace.

Some small steps can make a big difference. "Good drainage is critical," Ferar says. He also notes that though some people avoid wood, ETS Laboratories can test any material that is suspect. Especially worrisome are recycled woods and those treated with fireproofing, which can contain bromides. He also avoids epoxies. "We like to stay fairly natural."

One of the newest wineries in Sonoma County is Merry Edwards'. After a distinguished career, often making wine for others in custom crush facilities, she chose a pre-engineered metal building, though she says most people who visit don't realize it's steel.

The entertainment and office areas at Merry Edwards Wines are covered with stucco, but the production areas are white, metal panels over foam cores. "It's very well insulated, and it's very clean and workable," Edwards says, adding, "It's not meant to be fancy."

And though the visible doors are made of attractive, coated oak, there's no wood in the production area except barrels. The floor is concrete, but Edwards says she will probably coat it since the constant cleaning can take a toll. She has separate rooms with individual climate control for different operations.

Edwards says she was careful with costs, as she isn't a wealthy outsider like so many new winery builders, but she says she spent money on the important things--the hardcore winemaking equipment.

This equipment includes a new, remote punch-down system developed with R.S. Randall Co., and tanks with removable, sealable lids. In fact, 33 of her 37 tanks have removable lids (not the blending tanks), and the lids that are 6.5 feet in diameter are interchangeable, though the tanks range from 8 to 6.5 feet in diameter at their bases.

Also, everything in the 28,000-square-foot winery is mobile, so she can reconfigure it as necessary for different operations. This is facilitated by the lack of interior supports for the roof.

Because of the design and construction method, Edwards was able to break ground in October 2006, then start moving in by August 2007 to prepare for crush.

Like most other wineries, hers has other green touches: solar panels on the roof for a $10 per month electricity bill, low-energy fluorescent lamps, permeable concrete in the parking lot that lets water soak through, and flash hot water heaters distributed around the winery to avoid a larger boiler and tank.

For more information, see an article on TCA control in wineries *(*Wines & Vines, *June 2007, "T'ain't Necessarily Corks").*

The concrete flooring used at Novelty Hill-Januik Winery in Woodinville, Wash., is easy to keep clean and helps maintain consistent temperatures.

Temperature control

"Temperature control is one of the biggest factors in quality control," notes architect John Hall. That includes spaces as well as tanks.

His firm designs passive control as much as possible, including good insulation and orientation, plus shade from landscaping or construction. "We also try to establish heat sinks--though, of course, in rooms with wine, they provide the biggest impact once the barrels or tanks are filled."

One Hall and Bartley design that typifies this is Clos LaChance, located in the warm environs of San Martin, Calif. The winery's site was chosen to take advantage of the topography with the barrels underground, and it was oriented to keep heat away from the wine.

Another technique that is popular in California is night air-cooling to take advantage of the typical dramatic temperature drop at night. Even so, Hall notes that wineries still may need refrigeration on the hottest days. "You can't rely totally on passive means."

Even in the Pacific Northwest's Seattle area, heat is an issue. Susan McNabb observes that the concrete used to build the Novelty Hill-Januik Winery helps maintain temperature, and the barrel area is tucked underground for cooling.

Jeff Goodwin is seeing more wineries specify tanks with jackets that can be both heated and cooled for control of fermentation, including heating the wine to speed things up.

Joe Chauncey, who has designed a number of green wineries, says, "Mass around barrel storage areas--whether it is from the earth or thick insulated concrete, masonry or stone walls--can reduce evaporation from the barrel by up to 1,000%, keeping alcohol content more stable, resulting in more balanced wines."

Working conditions

Daylight and views in regularly occupied working spaces improve the health and attitudes of the winemaking staff. "When the winemaking staff is healthier and happier, they will most certainly make better wine," Chauncey says. "The role of beauty can't be underemphasized. One of the quotes I enjoy most came out of the Sanborn Conference near Colorado Springs in 1994: 'Beauty...is the yeast for the ferment of individual creativity.'"

Chauncey says he recently heard winemaker Marcus Notaro of the Col Solare winery on Red Mountain in Washington tell a group that the quality and the beauty of the winery he is now working in drives him to make better wine--in essence, to honor the building and the thought that went into its design. For Chauncey, this is the ultimate compliment.

Chauncey wrote a piece on how sustainable winery architecture can save costs *(*Wines & Vines, *October 2006, "Sustainable Winery Architecture").*

"The environment does affect quality, and not just for the wine but the workers," Susan McNabb says. At Novelty Hill-Januik Winery, the working spaces were designed to be filled with fresh air and light, though the barrel area has its own climate control system.

Though energy use, a green image and impact are all considerations in designing new wineries, making great wine is still paramount. Fortunately, there's no conflict between these issues, and though some of the steps taken to realize all of them can be expensive, they need not compromise each other.

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