



PRODUCT FOCUS

Forming a Solid Foundation

What wineries should know before renovating or installing new cellar floors and drains

By Stacy Briscoe

Trench drain solution for winery flooring by Aco Drains.

Regular splashes of acidic solution, constant foot traffic, the weight and movement of heavy equipment and the repetitive use of cleaning chemicals — these are just some of the high demands literally placed on top of a winery's floor. Whether reconstructing an existing space or designing a new build, the choice of flooring is one that impacts safety, sanitation and aesthetics.

Eric Kuhn, architect, LEED AP, at BAR Architects in San Francisco, whose firm has planned and designed more than 30 wineries ranging from 5,000 to 500,000 cases, said that when renovating a space specifically intended for fermentation and/or barrel storage, evaluating the existing flooring is important. "The main things to consider are the conditions of the existing floor and its cleanability, in addition to existing slopes and drainage," he said.

Kuhn said that, while there are epoxy coatings available on the market that "may be appropriate in some circumstances," he warns that in most spaces — especially in buildings not originally designed for winemaking purposes — a winery's best answer is to opt for all-new flooring. "The need for locating appropriate trench drains and floor drains, in addition to ensuring proper slopes to these

drains, make it difficult to simply adapt existing flooring," he said.

This proved to be the case for Sean Thompson, director of winemaking for Schramsberg Vineyards and Davies Vineyards, when, back in 2012, a former car dealership was transformed into a fully operational winery for the Davies Vineyards still red wine program.

Thompson said the original space came with an unfinished concrete floor that lacked a water barrier to assist with puddling. Their simple "first pass" solution when turning the area into the winery's tank room was to coat the existing floor with painted epoxy. Though this may have assisted with puddling, because the existing floor wasn't at all sloped, Thompson said, the draining system was "useless."

Slope is particularly important because, in addition to drainage, it can affect barrel stacking. Kuhn warned that a slope that is too steep may cause stacks to "be out of plane," increasing the risk of tipping. "Floor slopes that are too steep or have many transitions can also make it difficult or unsafe to operate forklifts," he said, recommending one-eighth inch per foot as the ideal slope measurement.

Thompson and team once again turned to epoxy to build up the flooring to add the ap-

KEY POINTS

An all-new floor, not a renovation, may be a winery's best solution.

Experts call concrete the most reliable material for cellar floors.

The degree of slope affects both cleanliness and safety.

propriate slopes angled toward the draining system. This time around, they chose a mixture with a higher volume of sand for added grip. "It's like 60-grit sandpaper," Thompson said. "The first coat was also too slippery, and there was a lot of falling."

Thompson said the difference between the two epoxy coatings was dramatically different.

"It's like a dream come true," he said. "It grips the shoes quite a bit better; there's very little wear. We've had it down for three or four years, and it looks and feels like new, and there haven't been any slips or falls."

Despite the successful and quick fix to his drainage and slippage issues, Thompson isn't completely satisfied with the choice of flooring. And, as the winery is currently in the process of renovating the barrel room,

Thompson said they're considering all options to replace the flooring entirely.

Starting from scratch

When building a new cellar floor, Kuhn said that at BAR Architects, a firm that also specializes in LEED-certified and sustainable building designs, concrete is the typical first choice for him and his colleagues. "It's durable, sealable and handles the necessary loading requirements from typical winemaking requirements such as forklifts, hand trucks and point loads from barrel racks and other equipment," he said.

Robert Morris, co-owner and general manager of one of Sonoma County's newest custom-crush facilities, Grand Cru Custom Crush in Windsor, Calif., said all of those factors played a part in his decision to choose concrete when he and his business partner, Todd Gottula, designed their new building from scratch. The winery, which opened in December 2017, is now host to 19 clients producing about 28,000 cases annually.

Because of the large volume of machine and foot traffic as well as the amount of wine being made, Morris said that concrete, which was sourced and installed by Miller & Elwood Concrete in Rohnert Park, Calif., was the obvious choice for his building.

When asked about the sensitivity of concrete, its tendency to corrode when exposed to acids (like that found in grape juice and wine) or high-pressure water (like that found in most winery cleaning systems), Morris said these are non-issues for him. "Concrete doesn't like acidic liquid ... but with the amount of acid in wine, it takes a long time for concrete to actually erode."

Architect Kuhn agreed, saying that in his experience building wineries, "spilt wine is less of a concern as the impact of the acidity is often negligible when the floors are cleaned/sprayed down often in these spaces."

At Grand Cru Custom Crush, Morris said they use a KEW Poseidon 7-67 portable electric hot or cold high-pressure with a Hydro Twister floor cleaner, which is operated like a lawn mower, gently scrubbing the surface and using very little, if any, chemical solution. "It's the *only* pressure washer to order," he said, adding it "works like magic." Both items are sold by AquaTools.

One thing Morris said to be wary about is the finish of the concrete. "When concrete is brand new, it's pretty smooth, and you do have to worry a bit about excessive amount of juice ... and grape skins. Nothing is slicker than grape skins," Morris said.

To prevent slippage, Morris had the concrete contractors apply a broom finish to the crush pad flooring — a process in which the still-wet concrete is wiped with a broom to create a subtle ridge texture. In the production area of the facility, Morris went one step further with a trowel finish — the same process as a broom finish but utilizing a steel trowel for deeper grooves. "I've seen forklifts actually slide on fresh concrete when not finished," Morris said.

Installing a drain system

Morris called his choices for draining pretty straightforward. For areas without easily maintained slopes

and those that do not experience constant heavy water flow, simple area drains are sufficient. At Grand Cru, Morris sourced stainless steel area drains from StainlessDrains.com out of Greenville, Texas.

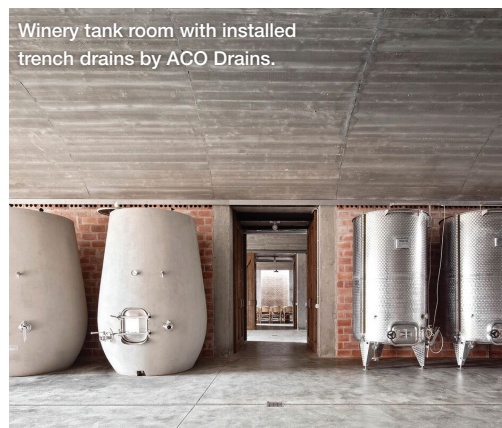
But for the bulk of the custom-crush facility, he chose to install trench drains from ACO Drain. These modular trench drains are made from corrosion-resistant stainless steel, specifically meant to handle high-acid materials, like grape juice or wine. Morris said the modular-style draining systems are ideal when installing really long runs of concrete that incorporate the gradual, gentle slope essential to a barrel room's foundation.

Architect Kuhn said, in general, trench drains are preferred for winery production areas because, since they run linearly along the front of fermentation tanks, they're easier to clean. Also, trench drains are less likely to become backed up from the solid matter found on production room floors, such as stems, grapes and leaves. Lastly, as mentioned by Morris, Kuhn said that trench drains more easily accommodate the gradual slope grade needed to maintain balance for the various types of winery equipment.

Morris explained that during construction when the bare ground is exposed, the first step is to run the piping — another important component to a winery facility's flooring. Morris stressed the importance of choosing chlorinated polyvinyl chloride (CPVC) piping. Unlike conventional polyvinyl chloride (PVC) piping, CPVC is altered by free radical chlorination reaction, increasing the chlorine content of the piping material. The chemical makeup means that CPVC can withstand higher temperatures (up to 200° F compared to 140° F). "If you use regular pipes, they can melt in the ground from all the high-temperature washing that goes on in a winery," Morris said.

Once piping is in place, the next step is to install the trench draining system. Using the modular style, the lengths of drains are put together and locked into position, and what Morris calls a "rough layer" of concrete is shot underneath them.

Once the bottom layer of concrete is dry and the draining and piping lines are secure, the top layer of concrete slabs is laid on top. "In the drawing stage, you can calculate the slopes needed for the concrete slabs," Morris said. "The architect will work with you to make sure you don't exceed the recommended slope." 📐



Winery tank room with installed trench drains by ACO Drains.

STAINLESS DRAINS

The EZ-STOP-LOCK was designed to secure drain components with the use of a magnetic lock. According to the manufacturer, this eliminates the possibility of garbage or debris being pushed down the drain and potentially clogging the trunk line. The magnetic locking device comes with a corresponding key that releases the lock when necessary for routine cleaning and maintenance. Because only the assigned key can open the lock, the drain is protected from being opened with wrenches, crowbars or pliers.

stainlessdrains.com

ACO DRAIN

The stainless steel trench drains by ACO are specifically built for drainage systems where corrosion resistance, hydraulics and durability are required. The stainless steel channels are available with either a constant depth or sloped configurations and can incorporate corners and branches as well. The systems are available from modular to fully custom-designed solutions in a continuous slot or with removable grates.

acodrain.us

EPOXY FLOORING

Brew Floor III epoxy floor system is a two-layer acid- and chemical-resistant system best used in areas where chemicals, acids, bleaches and cleaners would affect standard epoxy floors, such as commercial breweries or wineries. The kit includes the two-part epoxy primer, two-part topcoat with non-skid additive and all the tools needed for application.

brewfloors.com.

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