Expert Consultants of Wine Cellars and Wine Storage

How to Build a Wine Cellar

Step 1: Location of the Wine Cellar

The question most often asked is, “Can I put a wine cellar anywhere in the home?” The answer is yes, but the location that you choose will have a future impact on the cost of maintaining your cellar. A wine cellar should be placed in the coolest and most humid place in your home. The closer you are to the 55°-58° F temperature and 55-75% humidity that your wine will need, the smaller size cooling unit you will need and the lower the overall cost will be. The heat gain calculation for your wine cellar takes into consideration the surrounding environment that will affect the wine cellar. If the surrounding environment has an average yearly temperature of 85°, compared to an average temperature of 65° then you will have to purchase a larger cooling unit in order to maintain proper conditions. A dry environment will also require a more frequent introduction of humidity.

Step 2: Installing Studs

If this is new construction you will need to stud the space to frame out your wine cellar. Start by sealing the concrete foundation walls prior to installing studs. (Stop: Review Step 4 now, if you decide to use the 6 mil vapor barrier with new construction, you must do that step during studding. If you choose spray foam then continue on with this step as outlined.) Then use either 2x4 or 2x6 construction. The 2x6 construction is used when you want to increase the insulation value in order to minimize cooling unit size and energy consumption. This is similar to adding additional insulation to your home in order to minimize your monthly utility bills. You should obtain a permit and follow all local, state, and national building codes when building your wine cellar.

Step 2.1: Soffits

If you build a soffit to cover ducting, piping, or other obstructions, it is important to note that the lighting installed in the soffit should be placed far enough away so that it does not interfere with the finished racking and/or ducting depth, including depth of crown molding. You will want to ask for the final depth of your racking including the crown molding at this location and then make sure to allow for the size of the ring on the light fixture as well. A rule of thumb is to leave a 1" gap from the front of the crown molding to the closest edge of the ring on the can light. You also want to make sure to use IC can lights so you can insulate around them.

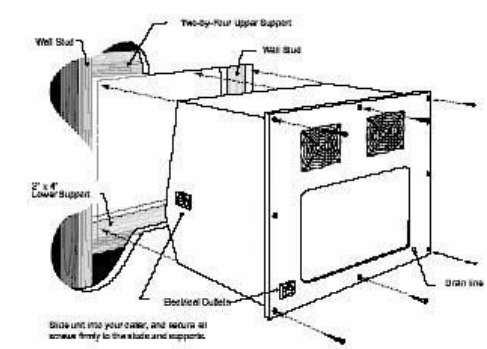
Step 3.1: Rough-in Refrigeration: Ducted Systems

If you are purchasing a ducted Air Handler you will need to run the ducting and line set at this stage. The ducting will be in the wine cellar, running to the air handler that is normally placed in a mechanical room. The line set is then run from the air handler location to the condenser location, standard condensers are located outdoors, but indoor option is available. You will also need to run a drain line and electric at this time. View our Air handler Systems section for more information on these units.

Step 3.2: Rough-in Refrigeration: Split Systems

If you are purchasing a split system you will need to run the line set at this stage. The line set is run from the ductless split location to the condenser location, standard condensers are located outdoors, but indoor option is available. You will also need to run a drain line and electric at this time. Note: The mounting plate shown is for clarity and is not installed until unit is on site and cellar wall is complete.

Step 3.3: Rough-in Refrigeration: Through the Wall Systems



If you plan to utilize a self contained cooling unit you will need to make a hole in the wall adequately sized for the unit. You will also need to run an electrical outlet near the space and it may need to be on the inside or outside of the unit based on the unit you decide to purchase. Many of these units also require a drain line, so you will need to allow for a location for a condensate drain. These units also do not have the ability to add humidity to a wine cellar so you may need to allow for a 110V electrical outlet for a humidifier in the wine cellar. For more information on these units please view the Whisperkool and CellarPro sections.

Step 4.1: Select Your Insulation & Vapor Barrier

There are two common methods for wine cellar insulation and vapor barriers. Spray foam or 6 mil vapor barrier and fiberglass batts. Spray foam is normally more expensive, but it will prevent the possibility of a puncture mark in your vapor barrier (as a 6 mil vapor barrier is not necessary when using spray foam) caused by someone inserting screws, running wire, plumbing, etc. into or through the wall from outside the wine cellar. With non-shrinking closed cell spray foam the screw will not compromise the enclosure and the foam will expand to fill all the crevices to ensure a tight seal. We do not recommend any specific brand over another, but Comfort Foam is one brand that will work for this application. Ensure there are no air gaps between the insulation and drywall for either method.

Step 4.2: Vapor Barrier for New Construction

If this is new construction and you are not going to use spray foam, then it is recommended that you install a 6 mil vapor barrier on the back side of your wall studs before lifting them into position. You will also need to wrap your ceiling joists as shown. In some areas the local code specifies all vapor barriers must be installed on the warm side of the cellar. In those areas we highly recommend you switch to the spray foam insulation.

Step 4.3: Wrapping the Walls & Filling Holes

Make sure to leave excess vapor barrier at the corners so that you can wrap it, overlap the seams and tuck tape (not duct tape) them shut. Then fill all holes in studs and joists with fire rated penetration sealant to reduce air movement. Tuck Tape UV resistant adhesive is a company that sells this product. We are
not recommending this company specifically, just an option so you know what you are looking for.

Step 4.4: Insulation & Vapor barrier for the Wine Cellar

If this is a remodeling project, it is OK to wrap the existing studs in the room as shown, in a similar fashion to the ceiling joists. Make sure the vapor barrier is on the warm side of the wine cellar, meaning the exterior cellar wall.

Step 4.5: Insulation & Vapor barrier for the Wine Cellar

After the vapor barrier has been installed you will need to put insulation in the stud and joist cavities. The most common insulation used is fiberglass batts. In a 2x4 wall cavity using fiberglass will provide you with an R-13 insulation value. In a 2x6 wall fiberglass will provide you with an R-19 insulation value. The entire cavity must be “fluffed” with insulation leaving no air filled cavities.

Step 5: Electrical Outlet Placement in the Wine Cellar

Outlets in a wine cellar are best placed in the dead spaces at the corners where your racks come together. If you place the outlet outside of this area it is possible it will be obstructed by one of the wine rack posts. It is important to follow your local building code for outlet placement and that will supersede any recommendations made for outlet placement in your cellar. How can Wine Cellar Innovations help? When you have placed the order for your wine cellar you may request an outlet placement design for your wine cellar where we will locate the proper placement of outlets for the various lighting options you have selected for your cellar.

Step 5.2: Outlet Placement for High Reveals with Lighting

It is not necessary to place an electrical outlet in the area where a high reveal racking is located in order to plug in your lighting. The cord will be able to reach down to the outlet placed in the dead space as far as 6 feet away. If you would prefer to have the outlet located in this area for ease of access you will need to inform your design consultant to locate the outlets accordingly when they do the outlet placement design for you. It is recommended that outlets for high reveals and other accent lighting, such as for archways, be placed on a switch.

Step 6: Wall Coverings

Once you have installed the studs, vapor barrier, insulation, and electrical outlets the next step will be to cover the walls and ceiling. You will need to utilize material that is resistant to the high humidity conditions that will be present in your cellar and based on that criteria the most common choice for wall and ceiling coverings is water resistant drywall (commonly referred to as green board). This is the same drywall that is utilized in bathrooms and kitchens of most homes and is therefore readily available. It is specifically recommended that the green board be screwed into the walls and ceiling of your wine cellar. Use fire rated penetration sealant to seal around all penetrations on both sides of wine cellar.

Step 6.2: Finishing the Drywall

The base molding will be attached to the front of the racking, which means it is important that you run the drywall all the way to the floor and do not allow any gaps. No molding should be installed on the wall so that the back of the rack remains flush with the wall.

Step 6.3: Painting the Drywall

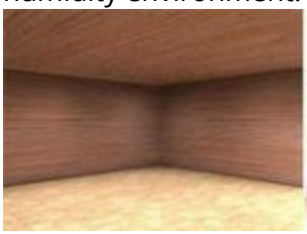
You should start with a good primer on the drywall and then use a water based exterior grade paint. Oil or solvent based paints can leave a lingering odor in the wine cellar, if you don't have time to let the space air out. Make sure your painter covers the drywall all the way to the floor. Typically they will stop an inch or two short of the floor as they know that will be covered with base molding. Your molding will be on the front of the racks, so this can leave an unsightly gap showing if they do not run the paint all the way to the bottom.

Step 6.4: Alternative Wall & Ceiling Coverings

A decorative option to cover your walls and ceiling would be to apply tongue and groove material that complements the wood, stain, and/or lacquer that will be on your racking. You will first need to screw ¾" marine grade plywood on your walls and ceiling so that you will be able to attach your tongue and groove.

Step 7: Flooring

When installing flooring in a wine cellar you want to ensure the flooring you select will withstand the high humidity environment. Therefore, you want to avoid using carpeting for many reasons, including the possibility it will rot. You will also want to avoid using vinyl flooring as the mastic under it will remain moist and the flooring will have the tendency to move and buckle. You can utilize a bare concrete floor, as long as you seal the concrete. If you want a more decorative option, it is common to utilize porcelain tiles, cork, or hardwood flooring. It is recommended that you allow a ½" gap all the way around the perimeter when installing wood flooring to allow room for expansion. If time permits, allowing the wood to acclimate to the wine cellar conditions for 48 hours will minimize the amount of expansion that occurs.



Step 7.1: Alternate Ceiling

In addition to utilizing tongue and groove paneling for your ceiling you can also install a raised panel ceiling and/or soffit. This does not provide any substantial difference to your insulation value, but it does make a dramatic difference in the aesthetic look of your cellar. Raised panel ceilings can be made to any room configuration whether it is a square, rectangle, octagon, or circle.

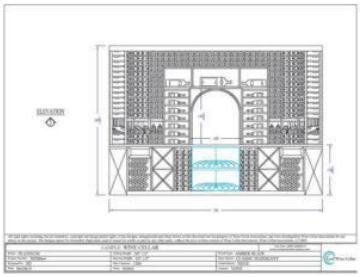
Step 8: Installing a Wine Cellar Door

You will need to install an exterior grade door sealed on three sides with weather-stripping and the bottom with a threshold and door sweep. You cannot utilize an interior door for this application. You are attempting to maintain an environment of 55°-58° F and 55-75% humidity levels and therefore need a barrier between that room and the other rooms of your home, which will be closer to 70 degrees and 20% humidity levels in most of the USA. If you utilize a glass door it will need to be thermopaned to allow for insulation properties and to ensure it does not condensate on the glass due to the temperature differential. You can also utilize solid wood doors if you prefer.
Please review the various door options that Cool Wine Cellar has to offer.

Step 9: Lighting

There are very few limitations when it comes to lighting options for a wine cellar. If you are going to utilize can lighting in a wine cellar, then you will need to use thermally fused can lights, also referred to as IC rated cans. There are also some concerns about the harmful effects of UV lights on long-term storage. There is no scientific evidence currently available that confirms that either way, but some in the industry would recommend you steer clear of UV lighting.

Step 10: Get Final Revision of Your Wine Cellar Design



When you have completed the construction of your wine cellar contact your design consultant and submit the final dimensions so the design for your cellar can be completed. We hope this information has been helpful to you. If you are looking to buy a wine rack, we can definitely help you out.
We do offer free designs. If you would like a free quote, make sure to include the wood, stain, finish, and other options you want included in your information.