NOTICE

Genuwine Cellars offers this free guide to assist you in constructing a proper wine cellar. The advice here is drawn from our nearly two decades in the custom wine cellaring business. You may find different recommendations and suggestions elsewhere, but this is how we do things (in general).

Please note that we cannot be held liable for how any of the information in this guide is interpreted or applied. **USE THIS GUIDE AT YOUR OWN RISK.** If you require professional wine cellar construction services, or just simply need some assistance, do not hesitate to contact us.
WINE CELLAR CONSTRUCTION GUIDE

This guide will take you step-by-step through the basic elements of the wine cellar construction process, but please keep in mind that no two projects are alike. Every cellar presents a unique set of demands, circumstances and challenges, making it impossible to provide a one-size-fits-all how-to manual. That said, this guide does provide an excellent overview of the process.

1) Determining the Position of the Wine Cellar in Your House

We recommend positioning your cellar below grade (in a basement), as it is generally cooler and more humid. It is entirely possible to construct a wine cellar above grade location.

In general, look to position your wine cellar where there is:

a) Adequate ventilation;

b) No direct exposure to sunlight or to heat; and

c) At least one external wall.

Most cooling units are mounted on an interior wall, exchanging air with another room (e.g., a utility room). If this is not possible, you may be able to mount the cooling unit in an exterior wall, but only if:

a) The cooling unit is protected (protective housings are available);

b) You live in a mild climate (temperatures never exceed 85°F or go lower than 40°F) [see Ventilation below]; and

c) The cooling unit experiences no direct sunshine or exposure to elements.

In general, we highly recommend avoiding installing a cooling unit in an external wall.

2) Framing the Room

Standard 2×4 or 2×6 framing is sufficient for wine cellar walls, and standard ceiling joists are adequate for the cellar ceilings.

Please consult your local construction building codes for more information.
For concrete walls, 2×4 wood studs should be inset about one-inch from walls, to allow insulation to go behind the studs.

Your wine cellar should be constructed to exact specifications of the kit racking to go inside. The more exact, the more your wine cellar will appear custom made. [See Racking below.]

All necessary electrical and plumbing rough-in work should be installed prior to insulation.

3) Vapor Barrier

A vapor barrier is critical to controlling the humidity inside your wine cellar.

In humid climates, this prevents warm, moist air from entering the cellar, which can cause mold. In dry climates, this helps to regulate the humidity within the cellar.

Apply 6mm poly to the warm side of all wine cellar walls, as well as the ceiling and floor. On interior walls this is done by wrapping the poly around the studs and applying it to the surface behind the insulation. This means continuous application between and around all studs and joists. This is the only way to ensure a complete and proper vapor barrier.

4) Insulation

Walls and ceilings must be insulated, using fiberglass, rigid foam (polystyrene), or blow-in insulation (fill to min. 4” depth for R-28).

In general, thicker insulation translates to better cooling. We recommend a minimum rating of R-22 for interior and exterior walls, and a minimum rating of R-32 for the ceiling (or higher if the ceiling is exposed to direct sunlight or strong winds).

For concrete walls, we recommend blow-in insulation (fill to minimum 4” depth for R-28).

If you suspect that the floor of your wine cellar might directly affect the temperature of the space, floor insulation should also be considered. Installing 2” x 2” wood sleepers with rigid insulation of R-7.5 placed between them should
be sufficient. In really cold situations you can build the floor with 2” x 4” studs on edge and fill with sprayed-in-place 2lb polyurethane.
5) Wall Covering

Regular drywall should be adequate for wall-coverings and ceilings, but if you have any humidity concerns, you should consider moisture-resistant drywall (greenboard).

Tongue and groove wood paneling is an option, but ensure you use rot resistant wood. See our list of premium wine cellar woods for more details. Wood can be left unfinished, but will stain if exposed to wine or water.

Use a latex-based paint to prime and paint the walls. Walls should be finished all the way to the floor as baseboards will not be needed as they will be hidden behind your wine racking.

In the case of glass-enclosed wine cellars, note that glass is a poor insulator. In this case, you might consider selecting a cooling unit with a greater BTU output to offset the diminished R-value. Generally, the next size up cooling unit will be adequate, but we recommend you consult a professional to be sure.

The glass should be a sealed thermal pane unit, with a 5/8” or 3/4” thickness. The glass should be sealed around the edges in the frame.

**NOTE:** We do not recommend you install a glass-enclosed wine cellar yourself. We work with tolerances on glass so refined that even many glass installers are unable to meet our demands.

6) Flooring

All types of flooring are used in Genuwine Cellars all over the world. Most common are tile, slate, hardwood, marble, and concrete, but vinyl and even cork are okay too.

We advise that you NEVER use carpet of any kind in a wine cellar. Carpet will mold and mildew in the cool, damp conditions of a wine cellar.

As with the case of wall coverings, flooring is normally chosen to match the overall décor and theme of the cellar/home. Finally, the flooring should be applied to a level surface.
7) Door

A wine cellar should be a sealed environment, and in this respect, the cellar door is often the weakest link. When a wine cellar isn’t sealed, it is difficult to control the temperature and the humidity, which often leads to cooling units running continually (not a good thing!) and burning out prematurely.

We recommend an exterior grade door with weather-stripping on all four sides. We also recommend the use of a sweep or threshold to form a tight seal. You should hear a vacuum ‘whoosh’ when you close and open the cellar door.

To learn more about wine cellar doors, we recommend you read about Genuwine Cellars’s line of Grand Entrance wine cellar doors, which are specially designed and created to be fully sealed units that will not bend or warp under cellar conditions.

8) Selection of Cooling Unit

The requirements of your wine cellar’s cooling unit will depend on a number of factors, including cellar size, your ambient climate, your intended use, construction plans, etc. We recommend you contact a professional to ensure you get the cooling unit right for your cellar.

9) Placement of Cooling Unit

Ideally a cooling unit should be mounted in an interior wall, between wall-studs. A wood frame will need to be constructed to hold the unit, which weigh on average between 50 and 120 pounds or more. The placement can vary depending on the model—follow the instruction manual that came with the cooling unit.

10) Electrical Requirements

It is a good idea to use a surge protector or power conditioner to protect your cooling unit. Make sure you run adequate electrical to accommodate the cooling unit, the main lights of the cellar, and also any accent lighting.
11) Lighting

Lighting in a wine cellar comprises an important part of the overall cellar décor. Genuwine Cellars recommends that you install low voltage or LED lights for your cellar. The goal should be minimal heat output and 0% UV rays.

It may also be a good idea to install timers or motion detectors, to avoid lights being left on, which could heat up the cellar over a long period of time.

12) Venting

Ventilation is critical when building a wine cellar. The room adjoining the cellar (which shares the same wall that the cooling unit is installed in) is called the exhaust room, and it requires proper ventilation.

In general, a cooling unit can only maintain a maximum temperature difference between the wine cellar and the exhaust room of approximately 30F. So, if the temperature of a wine cellar should be ideally set at 55F, the exhaust room cannot go lower than 25F or higher than 85F.

This is why you should not mount a cooling unit on an exterior wall when the ambient climate is consistency greater than 85F or lower than 40F. If hotter than 85F, the cooling unit will run continuously and the cellar temperature will rise about 55F (as it can only maintain a maximum 30F difference). In climates less than 40F, the central heat of the home will work to increase the temperature in the cellar, and you run into the same problem.

In a nutshell, this is how a wine cellar maintains a consistent temperature: A cooling unit blows cool air down at a 45 degree angle into the cellar, which pushes warm air to the ceiling. That warm air is then brought into the unit and passed into the exhaust room. In this way it regulates the temperature of the cellar.

As the unit cools the cellar, it generates at least as much heat on the exhaust side. If the heat in the exhaust room is not properly dissipated (i.e., if the room is not properly ventilated), the exhaust room will continue to heat up, and will likely surpass the 85F threshold. The result is that the cellar temperature will also rise (again, recall the 30F maximum difference).

Improper ventilation of the exhaust room is the element of wine cellar construction that most people get wrong. If the exhaust room is allowed to get too hot, the cellar temperature rises which is obviously not good since
consistency is the ultimate goal, but also, the cooling unit will run continuously, which can cause icing-over, or premature failure.

For these reasons, we do not advise that you use a closet as an exhaust room. Ideally, the exhaust room would be an open space, larger than the cellar. In this scenario, the heat is easily dissipated.

If the exhaust room is small and contained, an exhaust fan must be installed in the exhaust room to remove the warm, trapped air. But you must also have a fresh-air intake as well to regulate the temperature of the Exhaust Room and prevent air-lock (lack of air flow).

Having a properly ventilated exhaust room will ensure a consistent cellar temperature, will maximize the performance of your cooling unit and prolong its longevity. For more information, see our free guide Explaining Wine Cellar Cooling Units available at www.GenuwineCellars.com.

13) Racking

Racking varies dramatically based on styles, dimensions, quality, materials, finishes and craftsmanship (we invite you to read our free guide Points to Consider When Buying Wine Racks to learn more). Ultimately, your wine cellar can range from a purely utilitarian storage facility right up to an elaborate, custom-made work of art.

Design Services exist that can help you create a wine cellar using the racking style of your choice, while adhering to your needs and considerations: budget, bottle capacity, cellar purpose, etc.

Ensure that you use rot-resistant, inert wood, or your cellar may end up here on our Wine Cellar Rescue and Restoration page. We also recommend the use of hardwood in favor of softwoods, like Redwood, which can show wear and tear almost instantly. See our preferred list of premium woods.