

# LANDSCAPE ORNAMENTAL SERIES

A Guide for Louisiana Landscape Professionals



## Designing and Building a Deck

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A deck is a wonderful addition to a landscape, providing an elevated perch to observe the property, entertain guests or enjoy the sounds of nature while relaxing. Before getting into the basics of a building a deck, it is important to become familiar with some of the terminology, starting from the ground up (Figure 1). A deck is elevated by a support **post**, which is stabilized on the ground using concrete piers. These support posts hold up the **beams**, the weight bearing boards perpendicular to the post. These beams are used to support the **joists**, which are laid perpendicularly over the top of the beams. Joists are spaced close enough to support and distribute the weight of the people and objects above on the **decking** boards. Decking boards come in a wide variety of natural and synthetic materials, imparting various aesthetic and functional benefits.

Decks can be built as free-standing, where support posts are on either side to bear the weight of the beams, or they may be attached, where one side of the deck is supported by a building's existing frame. When attached to a house, a ledger board is installed on the outside wall and to anchor the deck to the building structure. Given the variation between building codes, building materials and uniqueness of installations, it is best to consult a licensed professional before embarking on this type of installation and potentially causing damage to the house's support. Therefore, in this article we will discuss building a free-standing deck.

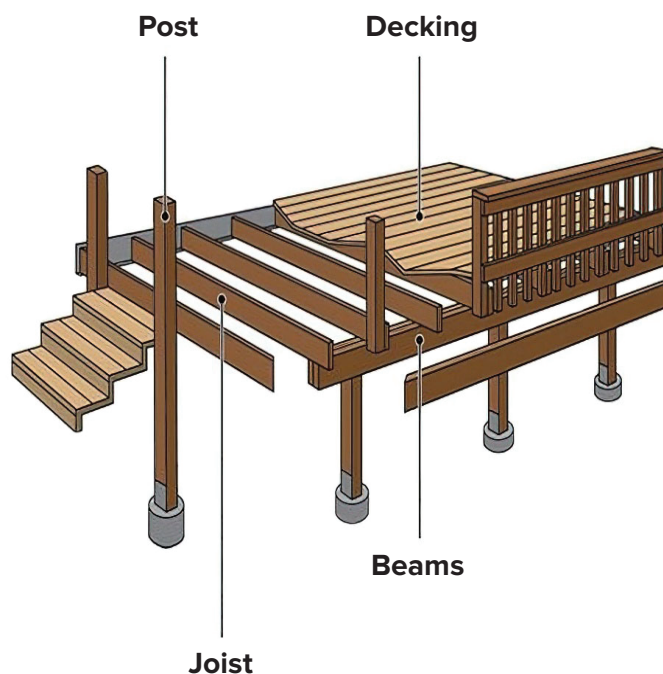


Figure 1: Components of a deck.



Image 1: Underside of a deck. Photo by Gretchen Gerber.

### Posts

Start with installing the support posts. With the planned dimensions in mind, use masonry string to identify the approximate outline of your deck and locations for the support posts. The larger the post, the more weight bearing capacity it has. A 6"x6" post would be ideal for most situations. The number and spacing of support posts/footings you will need depends on the weight bearing capacity intended for the deck. If objects such as a hot tub or heavy furniture will be placed on the deck, it is a good idea to have more support posts or to place them closer together. Make sure to check with your local building codes for information on minimum spacing, but it is less risky to over-build (in this case larger posts and/or closer spacing).

For a stable base, support posts should rest on concrete piers (Figure 2). Concrete piers can be installed by getting concrete tube forms — hollow cylinders which can be cut to desired height/depth — and filling them with concrete within a hole. The depth of the hole/pier must be deeper than the frost line to prevent heaving in cold weather, but the specific minimum depth will need to adhere to local code regulations. The height of the pier should extend above the desired finished grade. In order to allow the connection from wooden post to concrete pier, a post anchor will need to be installed. There are a variety of options available, providing different levels of adjustability. By anchoring wooden support posts to concrete above ground, the risk of the wood rotting prematurely is reduced, and if the post needs to be replaced later, the process will be far less challenging.

With the post/concrete piers installed, now is a good time to prepare the space underneath the deck while it is still readily accessible. The area under a deck can be a great location for storage of materials, tools or equipment. Consider placing landscape fabric under the deck with gravel overlayed to limit weed growth and keep a clean appearance.

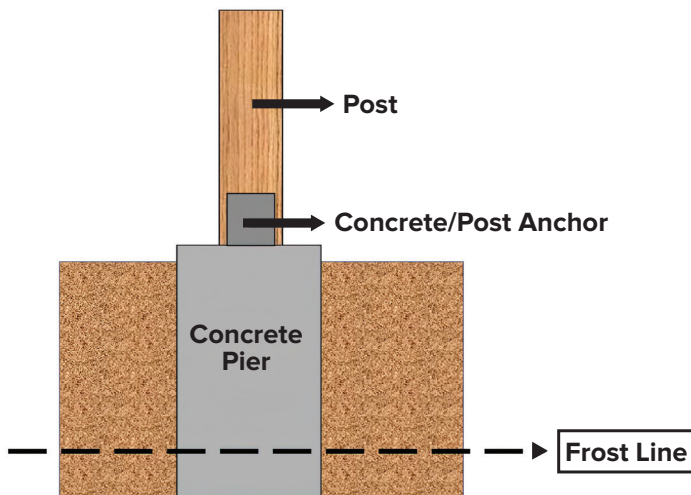


Figure 2: Connecting a support post to a concrete footer.

## Beams

With a stable base built, it is time to install the beams and joists. Beams will typically be comprised of two 2"x8" or 2"x10" boards attached together to create 4"x8"/10" double beams. These boards can be installed on the sides of the posts, onto a notched post, or on top of the posts and then secured with a throughbolt, carriage bolt or similar hardware. (Figure 3).

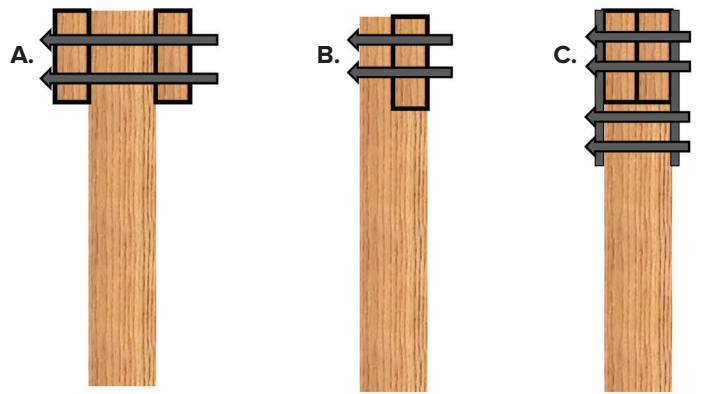


Figure 3: Different methods to connect a beam to a post. A: Beams attached with carriage bolts on the side; B: Notched post with beam attached with carriage bolts; C: Beams laid on top of post, secured with hardware plates.

## Joists

Next is the joist system. Joists are laid perpendicularly on top of the beams and are used to support the weight of the decking boards, objects and people on the deck. Joists are typically spaced at 16", but in some cases may be spaced closer or farther apart. Joists are connected to beams using hardware, such as hurricane clips, that are designed to resist the forces of strong winds from pulling the joists and attached decking from its anchoring.

## Decking

When selecting decking boards, there are numerous options available. Decking boards are most commonly found in 1 1/4"x6" or 2"x6" dimensions. Boards of a shorter width will require more total fasteners to install, and boards of wider widths will be more expensive. Deciding between using 1 1/4" or 2" thick boards depends on two primary considerations — the weight that needs to be supported and the joist spacing below. A thinner board (1 1/4") will not support as much weight as a thicker board (2") and may give a bouncy feel when walking on it because of flexing. A thinner board also may be more likely to twist, bow or cup over time and become damaged. Thicker boards can support more weight; however, the cost is greater per board. The second consideration in selecting decking board thickness is the joist spacing below. Decking boards are fastened at each joist, and as previously mentioned 16" on center spacing is one of the most common spacings used. This space between the joists is also known as the span. A shorter span will offer more support, reduce the bounce-like feeling in a board and may often be necessary in order to use thinner boards. A longer span will likely require the use of thicker boards. In any event, make certain that your local codes are being followed, as the allowable span length for different thickness deck boards are oftentimes explicitly stated.

## Customizing for Aesthetics

When it comes to the aesthetics of the deck, the boards will offer the most opportunity for creativity. Pressure treated southern yellow pine is a common option and fits in with the rest of the lumber used to build your deck. There will be maintenance required for wooden deck boards with recommended power-washing every year and re-staining every two to three years. Wood materials will require various maintenance regimens over the course of a lifespan, so be sure to use recommended sealers, stains and protectants for the lumber used.

Composite/plastic materials also are popular, particularly to those that desire a lower maintenance deck. These types of deck boards are made from polyvinyl chloride, or PVC, (composite boards typically also incorporate wood dust or other wood binder materials) and provide long lasting durability compared to traditional wood boards but do come at a greater cost. Certain composite decking materials can be installed with hidden fasteners, which are not visible to the untrained eye. These fit neatly into grooves in the side of the boards, so that there are no deck screws visible from the top. Table 1 shows comparisons between different deck board materials.

One of the most important considerations for all deck materials is the spacing between boards. There needs to be enough space for water to drain through but not so much space that it becomes a tripping hazard. Furthermore, wooden materials are subject to expansion and contraction with varying moisture content (and each type of wood is different) whereas composite materials will be more likely to fluctuate with temperature changes. Fresh, pressure treated wood is often saturated with preservatives and is wetter (i.e., more expanded) than more seasoned lumber. Pay attention to the saturation condition of your lumber and what the weather conditions are during the time of construction. The best advice is to follow supplier or manufacturer recommendations on board spacing, if available, and any applicable codes. Otherwise, a spacing

between 1/8" and 1/4" is typically ideal, with splitting the difference at 3/16" providing some flexibility in either direction. Using lumber or tile spacers is one option to ensure the distance is correct, but if you are using #10 decking screws, the diameter of the threads is already 3/16". Depending on the size of the nail or screw, one can use this as a built-in spacing guide.

Remember, before beginning any construction project, it is crucial to make sure you are aware of the local building codes for the intended structure and anything it connects to. Codes, permits and inspection information for your area can be found at your city level or parish level official websites. There are often explicitly stated measurements and installation practices for each component of a deck. Also make sure to call 811 before performing any digging or excavation to be sure there are no buried utility lines. Failure to adhere to codes, requirements and regulations can be costly and more importantly dangerous. Refer to manufacturer recommendations as well for every type of material used in the construction process.

Table 1.

|                                                                    | Pressure Treated Pine                                                           | Composites                                             |
|--------------------------------------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------|
| Installation                                                       | Nails, screws                                                                   | Nails, screws, hidden fasteners for grooved boards     |
| Maintenance (staining, sealing, board replacement, UV protectants) | Highest – routine power-washing, plus staining, resealing every couple of years | Lowest – power-washing often sufficient                |
| Lifespan                                                           | 10-20 years                                                                     | 25-30 years                                            |
| Cost (typical price range for 12' board)                           | Typically <\$20                                                                 | Depends on manufacturer and material type (\$20-\$100) |



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