

Deck Guide

The following information was compiled as a guide for residents who wish to build a deck. In order to obtain a permit, two sets of plans must be submitted for review. The plans are not required to be of architectural quality, but must provide enough information to determine that all construction will be built to minimum code standards. *The drawings must include the following information:*

- Indicate the dimensions of the deck, size, spacing, spans, and type of lumber being used. The plans should include a floor plan, elevations, stair detail, guard detail, and a pier detail.
- A copy of your plot plan showing the location of your house and proposed deck on the property. Indicate distances to property lines and keep in mind structures may not be located over an easement.

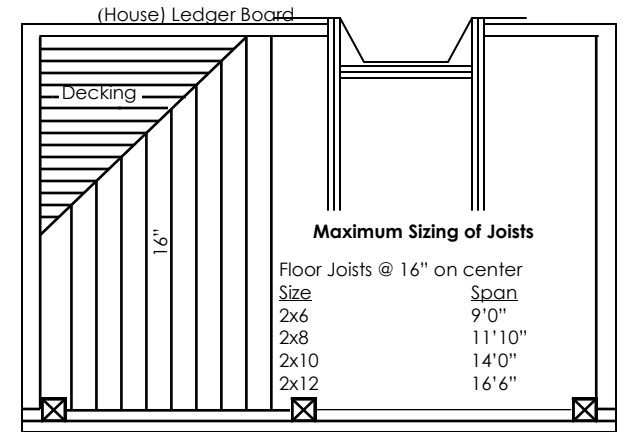
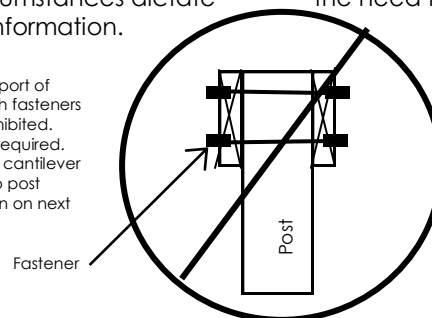
Typically, the more detailed a plan is, the faster we can issue a permit with little or no delay. The following is a list of common code requirements to keep in mind while drawing your plans:

- All footings/piers for posts must be 30" below grade for frost protection, and extend at least 24" into undisturbed soil. Piers shall be a minimum of 12" in diameter and belled to a minimum of 16".
- All load bearing posts must be anchored to footings with post brackets or other approved fasteners.
- All stair guardrail to be 34 inches minimum from nose of tread to top of rail.

- Posts and stringers shall not be in direct contact with the ground or pier.
- The ledger board is to be connected to the house with 1/2 inch bolts 3 feet on center. Joist hangers are required at the ledger board. Please observe the hanger manufacturer's fastener requirements. Do not use roofing nails or deck screws.
- Beam cantilevers are to be a max of 12" and joist cantilevers are to be a max of 2 feet or of a design sealed by a Missouri licensed engineer. Engineered floor joist header and ledger connections (ie: TJI, sturdy floor, etc) require additional bracing.
- If the finished floor height of the deck exceeds 30 inches above finished grade, a guardrail is required. Guardrails must be a minimum of 36 inches in height, and must not have more than 4 inch opening between. Guardrail support posts are not to be spaced more than 6 feet apart.
- If vinyl material is going to be used, provide the appropriate ICC report number.
- Stairs must have a minimum clear width of 36 inches. The stair riser height is not to exceed 7 3/4 inches. Tread depth must be a minimum of 10 inches measured from nose to nose. These measurements must be uniform (within 3/16 inch) for the entire length of the stairs. All risers must be closed or have maximum openings of 4 inches. Three stringers are recommended.
- Handrails must be 34 inches to 38 inches high, measured vertically above the nosing of the treads. Handrails are required to be graspable (example: 2x2, 2" diameter round, or 2x4 on edge.)

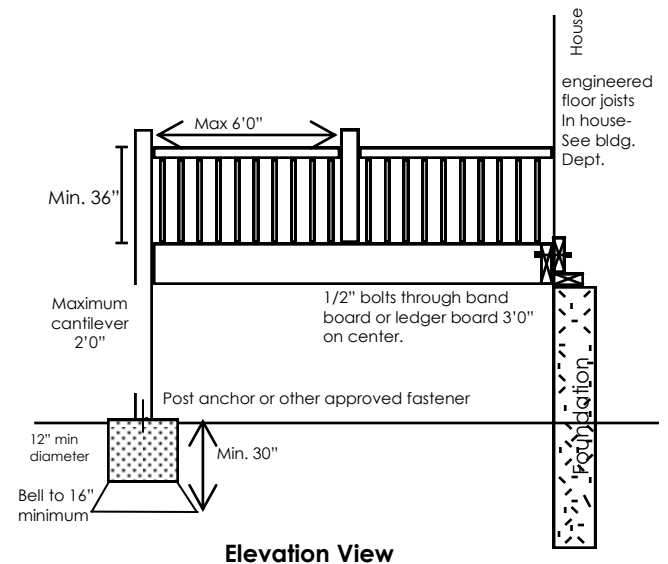
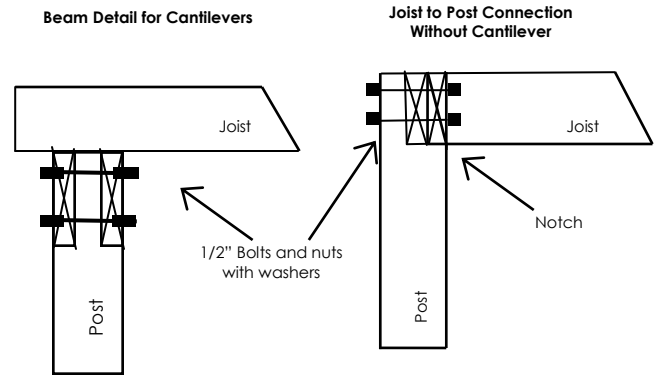
The preceding information is meant to be a helpful guide and applies to most simple residential decks. However, it does not include all of the codes that may apply. The plan reviewer may determine that unusual circumstances dictate the need for additional information.

Note: Support of beams with fasteners only is prohibited. Bearing is required. See beam cantilever and joist to post connection on next page.



Decking: min. 2 x up to 24" span.. Plastic composite materials shall be in accordance with ASTM D 7032 requirements.
Posts: 4x4 max post height is 8', 6x6 max post height is 14'

Floor Plan

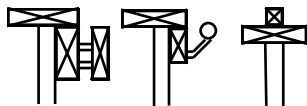


Elevation View

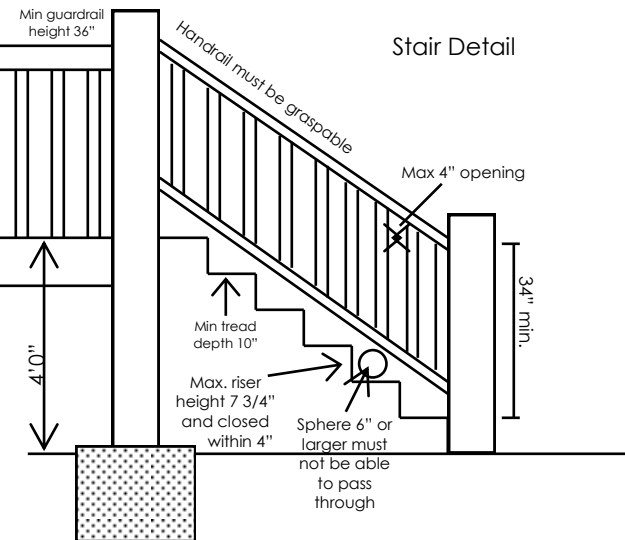


Typical Site Plan

Typical Graspable Handrail



Stair Detail



Inspection Procedures

Inspections must be called in 24 hours in advance and should be cancelled in the event of rain.

The first inspection will be completed when your piers have been excavated. The inspector will measure the footings to see that they are the proper depth and size. The location of your deck will also be verified to ensure compliance with property line restrictions. **These holes must be free of water and debris at the time of inspection.**

If the deck is less than four feet above grade, or will be wrapped with a vinyl covering, a framing inspection will be performed when all structural components have been installed.

A final inspection will be performed when the deck has been completed.

If you have any questions please contact the Building Department at 327-5102 or 332-5102.

Revised July 2020

**TABLE 507.2.1
PLACEMENT OF LAG SCREWS AND BOLTS IN DECK LEDGERS AND BAND JOISTS**

| | MINIMUM END AND EDGE DISTANCES AND SPACING BETWEEN ROWS | | | |
|-------------------------|---|-------------|-----------------------|---------------------------|
| | TOP EDGE | BOTTOM EDGE | ENDS | ROW SPACING |
| Ledger ^a | 2 inches ^d | 3/4 inch | 2 inches ^b | 1 3/4 inches ^b |
| Band Joist ^c | 3/4 inch | 2 inches | 2 inches ^b | 1 3/4 inches ^b |

For SI: 1 inch = 25.4 mm.

- a. Lag screws or bolts shall be staggered from the top to the bottom along the horizontal run of the deck ledger in accordance with Figure R507.2.1(1).
- b. Maximum 5 inches.
- c. For engineered rim joists, the manufacturer's recommendations shall govern.
- d. The minimum distance from bottom row of lag screws or bolts to the top edge of the ledger shall be in accordance with Figure R507.2.1(1).

**TABLE R507.5
DECK JOIST SPANS FOR COMMON LUMBER SPECIES^a (ft. - in.)**

| SPECIES ^a | SIZE | SPACING OF DECK JOISTS WITH NO CANTILEVER ^b (inches) | | | SPACING OF DECK JOISTS WITH CANTILEVERS ^c (inches) | | |
|--|--------|---|-------|-------|---|------|-------|
| | | 12 | 16 | 24 | 12 | 16 | 24 |
| Southern pine | 2 x 6 | 9-11 | 9-0 | 7-7 | 6-8 | 6-8 | 6-8 |
| | 2 x 8 | 13-1 | 11-10 | 9-8 | 10-1 | 10-1 | 9-8 |
| | 2 x 10 | 16-2 | 14-0 | 11-5 | 14-6 | 14-0 | 11-5 |
| | 2 x 12 | 18-0 | 16-6 | 13-6 | 18-0 | 16-6 | 13-6 |
| Douglas fir-larch ^d , hem-fir ^e , spruce-pine-fir ^f | 2 x 6 | 9-6 | 8-8 | 7-2 | 6-3 | 6-3 | 6-3 |
| | 2 x 8 | 12-6 | 11-1 | 9-1 | 9-5 | 9-5 | 9-1 |
| | 2 x 10 | 15-8 | 13-7 | 11-1 | 13-7 | 13-7 | 11-1 |
| | 2 x 12 | 18-0 | 15-9 | 12-10 | 18-0 | 15-9 | 12-10 |
| Redwood, western cedars, ponderosa pine ^g , red pine ^h | 2 x 6 | 8-10 | 8-0 | 7-0 | 5-7 | 5-7 | 5-7 |
| | 2 x 8 | 11-8 | 10-7 | 8-8 | 8-6 | 8-6 | 8-6 |
| | 2 x 10 | 14-11 | 13-0 | 10-7 | 12-3 | 12-3 | 10-7 |
| | 2 x 12 | 17-5 | 15-1 | 12-4 | 16-5 | 15-1 | 12-4 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

- a. No. 2 grade with wet service factor.
- b. Ground snow load, live load = 40 psf, dead load = 10 psf, L/Δ = 360.
- c. Ground snow load, live load = 40 psf, dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever with a 220-pound point load applied to end.
- d. Includes incising factor.
- e. Northern species with no incising factor.
- f. Cantilevered spans not exceeding the nominal depth of the joist are permitted.

**TABLE R507.6
DECK BEAM SPAN LENGTHS^{a,b} (ft. - in.)**

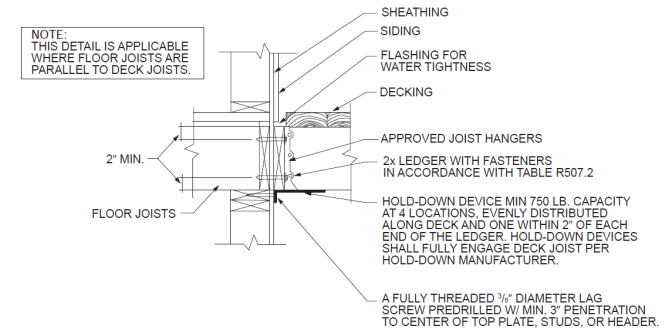
| SPECIES ^a | SIZE ^a | DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet) | | | | | | |
|---|----------------------|--|------|-------|------|------|------|------|
| | | 6 | 8 | 10 | 12 | 14 | 16 | 18 |
| Southern pine | 2 - 2 x 6 | 6-11 | 5-11 | 5-4 | 4-10 | 4-6 | 4-3 | 4-0 |
| | 2 - 2 x 8 | 8-9 | 7-7 | 6-9 | 6-2 | 5-9 | 5-4 | 5-0 |
| | 2 - 2 x 10 | 10-4 | 9-0 | 8-0 | 7-4 | 6-9 | 6-4 | 6-0 |
| | 2 - 2 x 12 | 12-2 | 10-7 | 9-5 | 8-7 | 8-0 | 7-6 | 7-0 |
| | 3 - 2 x 6 | 8-2 | 7-5 | 6-8 | 6-1 | 5-8 | 5-3 | 5-0 |
| | 3 - 2 x 8 | 10-10 | 9-6 | 8-6 | 7-9 | 7-2 | 6-8 | 6-4 |
| | 3 - 2 x 10 | 13-0 | 11-3 | 10-0 | 9-2 | 8-6 | 7-11 | 7-6 |
| Douglas fir-larch ^d , hem-fir ^e , spruce-pine-fir ^f , redwood, western cedars, ponderosa pine ^g , red pine ^h | 3 - 2 x 12 | 15-3 | 13-3 | 11-10 | 10-9 | 10-0 | 9-4 | 8-10 |
| | 3 x 6 or 2 - 2 x 6 | 5-5 | 4-8 | 4-2 | 3-10 | 3-6 | 3-1 | 2-9 |
| | 3 x 8 or 2 - 2 x 8 | 6-10 | 5-11 | 5-4 | 4-10 | 4-6 | 4-1 | 3-8 |
| | 3 x 10 or 2 - 2 x 10 | 8-4 | 7-3 | 6-6 | 5-11 | 5-6 | 5-1 | 4-8 |
| | 3 x 12 or 2 - 2 x 12 | 9-8 | 8-5 | 7-6 | 6-10 | 6-4 | 5-11 | 5-7 |
| | 4 x 6 | 6-5 | 5-6 | 4-11 | 4-6 | 4-2 | 3-11 | 3-8 |
| | 4 x 8 | 8-5 | 7-3 | 6-6 | 5-11 | 5-6 | 5-2 | 4-10 |
| | 4 x 10 | 9-11 | 8-7 | 7-8 | 7-0 | 6-6 | 6-1 | 5-8 |
| | 4 x 12 | 11-5 | 9-11 | 8-10 | 8-1 | 7-6 | 7-0 | 6-7 |
| | 3 - 2 x 6 | 7-4 | 6-8 | 6-0 | 5-6 | 5-1 | 4-9 | 4-6 |
| | 3 - 2 x 8 | 9-8 | 8-6 | 7-7 | 6-11 | 6-5 | 6-0 | 5-8 |
| | 3 - 2 x 10 | 12-0 | 10-5 | 9-4 | 8-6 | 7-10 | 7-4 | 6-11 |
| | 3 - 2 x 12 | 13-11 | 12-1 | 10-9 | 9-10 | 9-1 | 8-6 | 8-1 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

- a. Ground snow load, live load = 40 psf, dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever with a 220-pound point load applied at the end.
- b. Beams supporting deck joists from one side only.
- c. No. 2 grade, wet service factor.
- d. Beam depth shall be greater than or equal to depth of joists with a flush beam condition.
- e. Includes incising factor.
- f. Northern species. Incising factor not included.

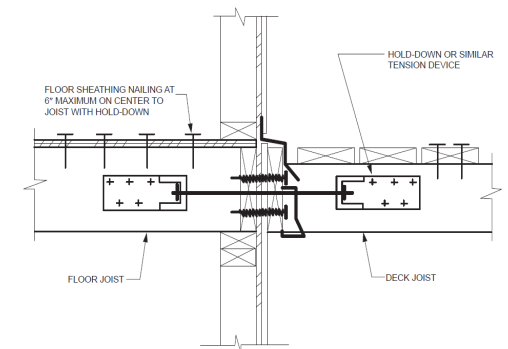
Deck Submission Self-Check List

- City permit approval **Does Not** constitute subdivision approval. Please contact your subdivision's HOA for any of their requirements.
- Application accompanies plans and plot plat
- Plan includes a floor plan, side elevation view and stair detail
- All deck plan dimensions are shown clearly
- Plan includes **size, spacing and span** of material
- Plan includes material types
- Plans show footing size and depth below grade
- Plot plan indicates set back from side and rear in feet
- Plot plan must be to scale
- All required stair geometry is shown
- Support posts are shown with an anchoring system
- Identify if your home was built with engineered floor joists
- Plans show all connections to the house
- Plans show guardrail heights, spacing, etc.
- Posts, beams and cantilevers are clearly shown



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

**FIGURE R507.2.3(2)
DECK ATTACHMENT FOR LATERAL LOADS**



For SI: 1 inch = 25.4 mm.

**FIGURE 507.2.3(1)
DECK ATTACHMENT FOR LATERAL LOADS**