

BUILDING A DECK

If you are about to build a deck on your house I would strongly advise you to go to the Internet and look up "Deck Disasters" it will enlighten you, it did me.

I have seen a lot of decks that I would rather keep my family and friends off of. Most decks are built properly and to code. I've never seen a building inspector inspect the footings on a deck or get under a house and look at the floor frame, they should, but usually don't.

This article is going to show you the proper way to frame and build a deck, and later on I am going to show you how to install balusters and hand rail and make your own fittings for a custom style railing.

The first and foremost part of any structure that is fastened to the ground is a good footing, pier or concrete beam.

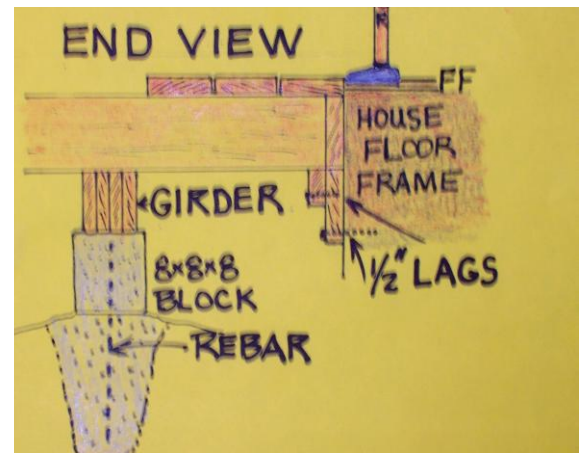


This is an 8" post hole I dug 24" deep and then put in some broken pieces of cinder block and tamped them down until the tamp bar began to ring. This will give you about a 95%

compaction which is, most of the time, 95% more compaction than most pier footings ever get. I flare the hole at the top and make a 12" diameter top of the concrete pad. Many piers just have holes dug and then concrete poured into them, take my word, they will settle. Many decks are built on concrete piers sitting on top of the ground and then the deck is built. A good rain will wash these away and you have a disaster on your hands.

Next step is to pour the pier footings. I slowly pour in Sakcrete and spray water with it as I pour it in and then tamp the moist concrete until I get it to elevation. It will get solid as a brick and this tamping process will totally bond it to mother earth.

This is, on a smaller scale, is what we did when we installed caissons.

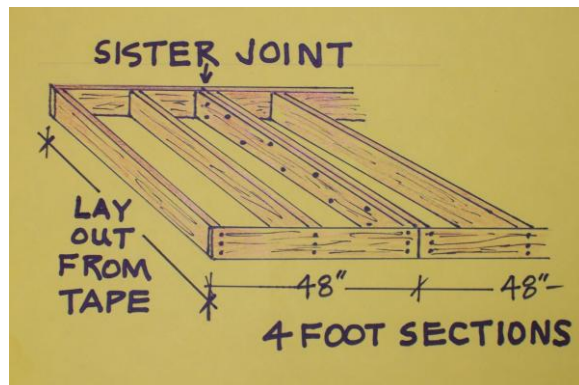


This picture has a lot of details in it, expand it to 150% and study it. As you can see there are no joist hangers, but you are welcome to use them, I had

rather use the ledger method, as shown, bolts on 16" centers and notice the bolts on the main ledger next to the house wall are at the bottom. They won't do much good if they are at the top, as usually shown on TV. If you put them at the top, you only have a 2x2 strip of lumber supporting the deck frame; the bottom of the ledger below the bolts is not doing anything, just dead weight. You could saw this bottom part of the ledger off and the lumber above the bolts is still what you have holding the frame. The bolts need to be 1½" from the bottom. You can also see that the top of the deck boards are even with the bottom of the door threshold.

Why put a 3" step here as some builders do. Makes no sense.

Also you can see the girder is a 4 ply 2x6 treated sistered beam, don't skimp on the girder. I always set the girder where that it is about 2/3's of the depth of the deck towards the front of the deck. If I have a deck frame that is 12' deep I set the girder at 9 or 10' from the house.



This picture shows how I frame the joist for the deck frame. I use this method if I am building any deck where that I will have butt joints in the deck boards. I absolutely never have two deck boards that meet on a single joist.

If I am building a 24' wide x 12' deep deck, I build six 48" x 140½" frames as shown in the picture. I cut two 4' plates and three 137½" joist, just exactly as the picture shows. Then I sister (align and nail) these 4' deck frames together when I set them on the ledger and girder beam that I have built.

This is a lot easier and faster than hanging the joist one at a time and then trying to get the rim joist on. After I have all of the deck frames sistered and nailed to the house frame I square the total frame and nail it to the girder beam. Then I install the 1½" rim joist that I clamp and shoot the nails from the back, so you don't see any nails on the front of the deck rim. ([Read "How to lay out a foundation" in Carpenters Corner to learn how to lay out this girder beam square and parallel to the house\).](#))

Now for the question all of you should be asking yourself is how did I come up with the 137½" joist, the 140½" rough frame and then install a finished 1½" rim to get a overall depth of 142" for a 12' deck depth.

I'll be glad to explain this little known procedure to you. It

should be known to all carpenters, but explaining and trying to show a 20 veteran carpenter how to do this procedure is like trying to explain to a mule how to plow a field by himself.

Carpenters have their way of doing it and no one, especially me or another carpenter is going to change them. People say mules are hard headed; they can't hold a light to some of the carpenters I've know.

A dry 2x6 deck board is $5\frac{1}{2}$ " wide, or within $\frac{1}{8}$ ". A wet 2x6 treated deck board is $5\frac{3}{4}$ " wide most of time and you have to jamb them together when you nail them on and when they dry out they will be $5\frac{1}{2}$ " as they were before they were pressure treated or you'll end up with a $\frac{1}{2}$ " gap between the deck boards.

We are going to deal with dry 2x6. If you have wet lumber, you still lay out on $5\frac{3}{4}$ centers.



The $11\frac{1}{2}$ and the $17\frac{1}{4}$ black marks are on $5\frac{3}{4}$ " centers. The red marks are on $4\frac{8}{16}$ " centers for balusters.

I know very well that I am going to confuse some of you explaining this but if you read and apply these instructions, I know you can do it.

I have memory marks on this tape that are every $5\frac{3}{4}$ ", $11\frac{1}{2}$ ", and $17\frac{1}{4}$ " all the way on the tape. I see $143\frac{3}{4}$ ", this is from the

front of the house to the front of the first deck board on the front of the deck. All of these black memory marks denote the front of a deck board. If someone wants a 12' deep deck, I simply take off a 3" for the cantilever of the front (first) deck board for and the finished rim and I have a $140\frac{3}{4}$ " deck frames, then I subtract 3" for the plates and I have $137\frac{3}{4}$ " floor joist.

Now to get all of these memory marks, you take a calculator and enter 5.75 (which is $5\frac{3}{4}$ ") and then push plus, and then push plus again. Then push equals and you will get 11.5 ($11\frac{1}{2}$ ") then push equals again and you will get 17.25 ($17\frac{1}{4}$ ") and so on, equals, equals, equals.

Let me tell you something else about your calculator. I use Casio scientific calculators (model fx 260), yours may be different, and these are only \$9. If you want the know the angle/rake of a right triangle (hypotenuse), enter the rise 5, then, shift, then R-P, (it's the plus button) then the run, 12, then equals, gives you 13, the rake, then click the, shift X-Y button (on the top in yellow markings) and this gives you the rise/rake angle 67.38° . To get the bottom angle, enter run first, 12, shift R-P [this is Radial-Polar] then enter 5, gives you 13 again, the rake, then hit shift X-Y, 22.61° , then if you need the degrees/minutes/seconds for a

Total Station push the backward arrow (<-) on the top chart and it will give you 67°22'48", 67 degrees, 22 minutes, 48 seconds. This is a long from building a deck but you need to learn how to use that little \$9 calculator.

Back to the deck.

Make memory marks on your tape of these measurements. Now you have a deck board layout tape to store and use for laying out the front edge of deck boards and to calculate deck frames.



Here I am using a Cathook to push the crowned deck board back to the layout mark. There are a number of deck board straighteners on the market and you will need one to build and install deck boards. They are from \$20 to \$100. All will do the same thing. Always lay the board where that the crown is out so you can push it to the mark instead of having to wedge it apart and damage the boards.

One important thing about building a deck is that you inspect the substructure of the house frame you are going to

attach the deck to. If it is not absolutely sound and solid, I would strongly suggest you install a girder beam right up next to the house and only use the house frame to hold the deck in place, not relying on the house frame to hold the deck up.

Never span 2x6 joists over 6' feet when you have your joist on 24" centers. Never have a butt joint of two deck boards meet on a 1½" joist, do as I do, make all of your butt joints meet on a doubled, sistered 3" wide double joist and apply a healthy bead of construction adhesive in the sistered joint to keep water from draining down into the center of the two 2x's.

I stagger framing nails on a deck board, front/back then I come back and install 3" deck screws front/back to where that I have a nail and a screw in each joint. As far as "bark side out" "bark side in" (the correct name is wane) I've seen boards cup both ways, but usually they will cup towards the center of the tree, just the opposite that they tell you on TV. If I have wane I put in down. I install the inside of the tree side down.

There is a whole lot more to building a good solid deck than meets the eye, especially after 2 or 3 years and the deck starts to come apart.

<http://carpenterbooks.com>

Bob Johnston