from WORKBENCH MAGAZINE

A Showcase Deck

Take a poll among avid do-it-yourselfers and I'll bet that building a deck ranks near the top of everyone's wish list, or for those who've built one already, among their favorite projects. It's easy to see why. For my money, no other home improvement brings together all the practical benefits of being a DIY'er — cost savings, quality control, added space or livability — with the fun and satisfaction involved in building with wood.

A good deck design can be easy to build, though attention to detail is still a must. This combination can make it a very labor-intensive (and costly) project if you hire it out to a pro, but one simple enough so that most homeowners don't have to. Whatever your budget, you'll get at least twice the mileage out of it by providing the labor yourself. It's simple math. To meet your dollar target, a contractor will likely want to crank out a "no-frills/one style fits all" deck package and move on to the next job. But roll up your own shirt sleeves, and the same money will get you a customized project that's bigger, better-built, and probably looks more like a natural extension of your home.

My deck project might look elaborate, but that's the beauty part. It's really just good basic carpentry, dressed up with some imagination and innovative hardware. Even the

multilevel design relies on just the repetition of a simple frame structure (Deck Construction View). From footings to railings, almost every feature it offers was managed with little more than basic tools and good old-fashioned muscle.

Speaking of muscle, the more the better. Any deck project goes faster and safer with at least one more pair of willing hands, so don't be afraid to recruit a friend or relative to help. I lucked out with Kirk, a friend with a fair amount of deck-building experience under his belt.

LET THE PLAN EVOLVE

Most of you wouldn't guess it from the reading on your outdoor thermometer, but spring is a perfect time of year to think about the kind of deck that's right for you and your home (see *Planning Basics).*

Planning Basics: The First Steps

1) Take measurements of the site, then make some quick sketches to explore possible design options.
2) Call local utilities to arrange a free inspection for underground lines. Plan ahead to avoid electrical cables, or gas and water lines, when you dig footing holes.
3) Pick your design and draw detailed plans. Draw up a materials list and a project budget.
4) Bring the deck plan to a building official in your town so he or she can amend it or approve a permit. The code check will involve footing depth, railing and stair designs, beam and joist spans, and other structural details.
5) Get your lumber on site at least six weeks ahead of time. Sticker it to allow air drying, and keep it stored out of the sun and rain.

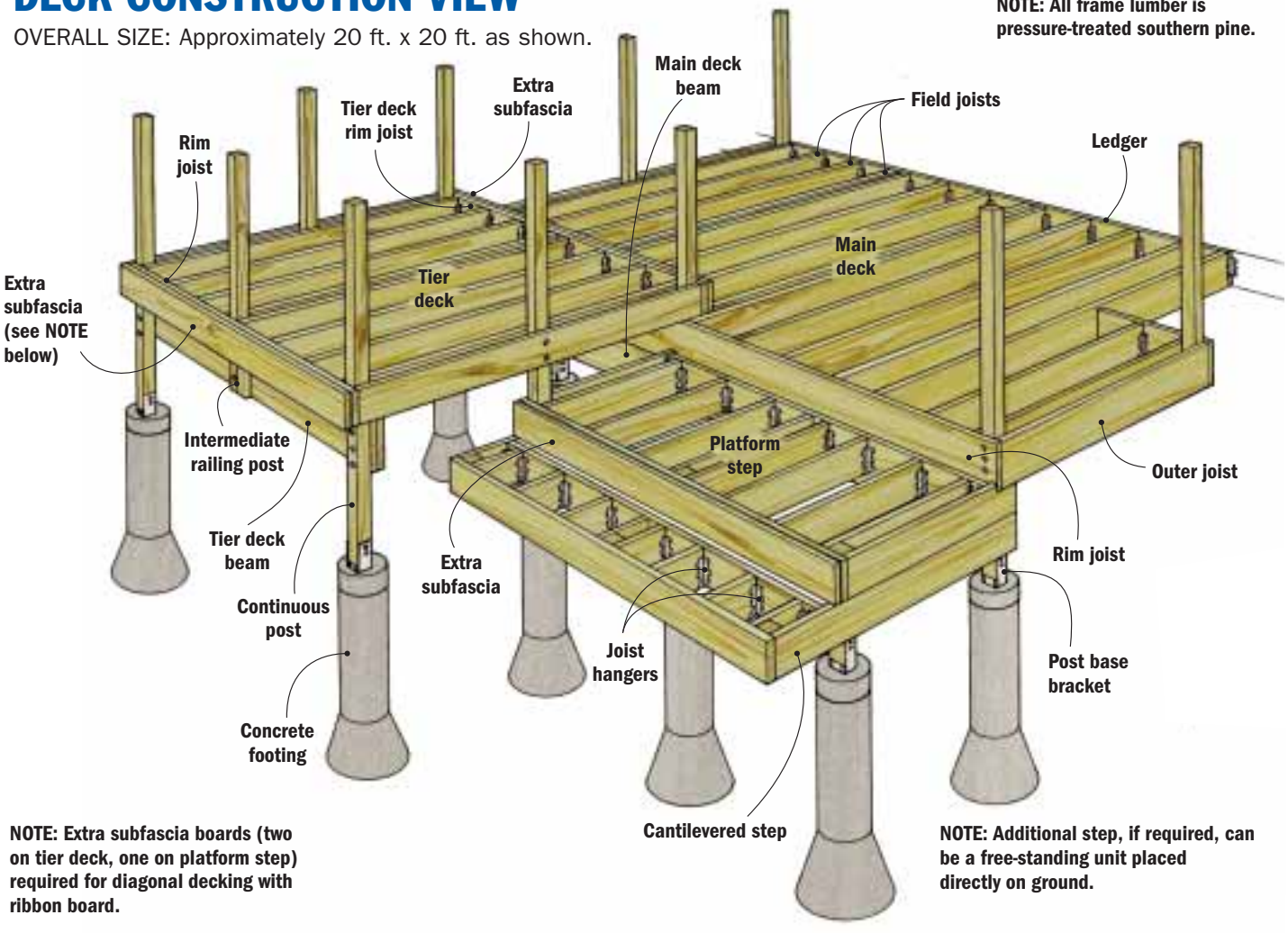
Good design ideas have to evolve. Do you want just a spot to cook and eat outside? To relax with family? Room to entertain guests? How about the need for privacy, or protection from harsh sun or wind? All these factors will influence the size, shape, and orientation of your deck.

My design provides a main deck for cooking and eating, but also a separate conversation area and a wide platform step. Even modified for your site, the construction basics still apply. (Incidentally, 20 ft. is the maximum length for pressure-treated lumber, so design accordingly.)

DECK CONSTRUCTION VIEW

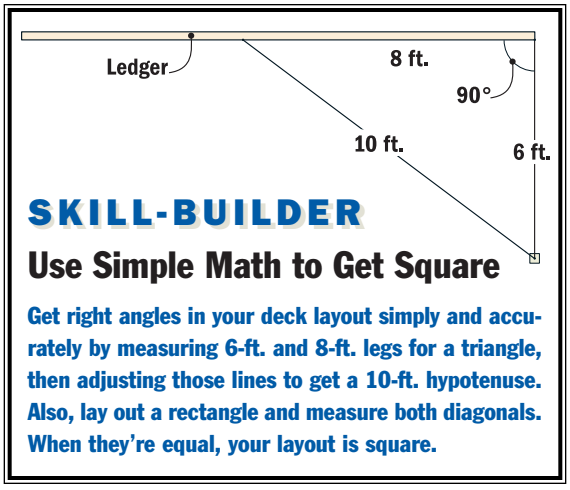
OVERALL SIZE: Approximately 20 ft. x 20 ft. as shown.

NOTE: All frame lumber is pressure-treated southern pine.



NOTE: Extra subfascia boards (two on tier deck, one on platform step) required for diagonal decking with ribbon board.

NOTE: Additional step, if required, can be a free-standing unit placed directly on ground.



SKILL-BUILDER

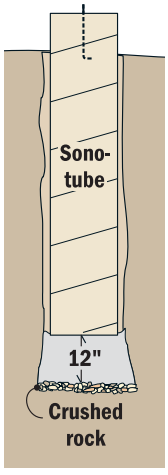
Use Simple Math to Get Square

Get right angles in your deck layout simply and accurately by measuring 6-ft. and 8-ft. legs for a triangle, then adjusting those lines to get a 10-ft. hypotenuse. Also, lay out a rectangle and measure both diagonals. When they're equal, your layout is square.

Deep footings or tough soil make hole-digging a job for a power auger. For easier sites and for final cleanout, you can use a manual posthole digger.

Assemble batter boards just outside the deck layout. These let you place and adjust string lines to mark the post locations precisely.

FOOTING ANATOMY



FOOTINGS FIRST, FUN LATER

Okay, I know I said that building a deck is fun, and it is, but staking the layout and then digging and pouring the concrete footings is sort of the "paying your dues" part. Don't hurry it, though. Everything that follows these steps rests, and I mean literally, on the work you do now.

It's not uncommon to see a deck's posts set directly in concrete footings, but I'd never recommend this method. Burying the post ends in concrete invites premature rot and makes it harder to replace them. With fence posts and similar projects, you don't have much choice, but the weight and greater complexity of a deck call for something better. Let the posts rest atop the concrete, secured by metal hardware. Most local code specs require this anyway.

With your plan drawings to guide you, measure from the house to establish the corners for the deck (see the SKILL-BUILDER). Then drive wood stakes to mark the footing locations.

You'll notice that I didn't hand-dig the footing holes for my deck. I've done it before, but this design required nine 42"-deep footings in the toughest clay soil I've ever seen. A local landscaping contractor with a skid-steer tractor and a power auger had them dug in an hour, for a cost of about $200 (FIG. 1). Accurate marking of underground utilities beforehand is critical! I used a clamshell digger to flare the bottom of each hole into a bell shape, then tamped the bottom of the holes with the end of a 4x4. Soil compaction helps the footings resist settling. Finally, I added 3" of crushed rock in each hole.

A set of batter boards comes next (FIGS. 2,3). By running string between them and to the house, these guides help you lay out the location of each post center. You can remove and reset the strings precisely as needed.

Because the footing piers extend above ground level (grade), you need some kind of form to contain the concrete (FOOTING ANATOMY). I used 10"-dia. cardboard cylinders called Sonotubes, which extend down to within a foot of the bottom of the holes (FIGS. 4–8). Pay attention to the grade as you set these. The ground should slope away from the house, so

Tie strings close to their final location and check for square corners (see Skill-Builder). Drive screws to mark the centers and edges of the posts.

Use stakes and crossbars to suspend the footing forms about a foot off the bottom of the hole. Drive 1¼" screws to hold the form level in one direction.

Rest a second pair of crossbars on the first pair, check the form for level in the other direction, then drive screws to "lock" the form where it sits.

Keeping the forms level to each other looks best, but sloped terrain might require multiple levels.

An inverted BigFoot footing form saw duty as a funnel for our concrete pour. Use care not to disturb the cardboard forms or you'll dislodge their screws.

Use the strings to guide the anchor bolt placement, then slide a "keeper" board under the nut.

make sure the height of the first footing allows for differences in grade at the other footings. After you place the concrete and insert the anchor bolt, cover each footing with plastic and let it "cure" for 3-7 days.

SETTING THE LEDGER BOARD

Unless your deck is a freestanding design, you'll also need to connect it to the house. That's done with a ledger board bolted (or lag-screwed) directly to the house frame. It establishes the height of the deck and also provides an anchor for the joist ends nearest the house. Obviously, the ledger needs to be at least slightly higher than the concrete footings.

Sometimes, installing the ledger requires removing a section of siding, especially if it's a weak material such as vinyl or aluminum. But on wood or solid composite materials, you can often bolt the ledger in place right over the siding. Even then, metal flashing is almost always necessary to divert water away from the ledger/house connection and help prevent rot (FIG. 9).

Mark your joist layout on the ledger before you drill for hardware, so the bolts don't interfere with the joist placement. Keep in mind that the footings determine some of the joist locations, since the posts they support connect directly to the frame.

Unlike the footings, the ledger works alone supporting its end of the deck, so secure fastening is essential. Wood props and a few 16d nails will hold it temporarily in place, but you need serious hardware for the long run. If you're fastening to the house's rim joist and you have access to its inside face, drill past the ledger and drive $^1/_2$"-dia. bolts through the ledger, siding, and rim joist (FIG. 10).

If you don't have access to the inside face of the rim joist, use lag screws to fasten the ledger, but make absolutely sure they thread into structural lumber in the house frame, not just siding or sheathing.

In my plan, the joists that straddle posts sit just a few inches apart. These allow for the decking splices and perimeter details that come later. The other joists get installed in-between, spaced at 16"-on-center or less.

After securing the ledger to the house, mount the joist hangers so they're flush with the ledger's bottom edge (FIG. 11). I fastened the hangers with #8 × $1^1/_4$" washer-head screws (from Simpson Strong-Tie) designed for just this purpose.

If your concrete footings are still "green" (uncured) by the time your ledger's installed, take a break until the next weekend. Stressing the anchor bolt mounts too soon can crack the concrete, and you'll have to replace the entire footing.

Whether or not you remove the siding behind the ledger, tuck metal flashing under the siding course above it to divert water away from that area.

If possible, drill through the rim joist of the house frame, then bolt through the ledger and rim joist. Or drive lag screws, but be sure you hit that joist.

Metal hanger brackets will support the deck joists at the ledger. Nails don't hold as well and tend to squeak after a while, so use screws to fasten these.

Realign the guide strings (to the post edges) to install the post brackets. The standoff cap covers the nut/bolt.

Center the post in its bracket, check it for plumb, and use a pair of clamps to hold it in place until it's bolted.

Tie temporary braces to wood stakes and to the top end of each post, so the post alignment is kept intact.

BRING THE FRAME TOGETHER

With your footings and ledger prepared, you can assemble the structural frame of the deck. (For guidelines on beam and joist sizes and spans, see *Sizing Your Lumber*, p 6.)

Start by resetting the batter board strings from over the post centers (at the anchor bolts) to where the outside faces of each post will be. This means shifting the string lines half of the post thickness ($1\frac{3}{4}$" for the nominal 4x4 posts I used). Then install the post base brackets **(FIG. 12)**.

The batter board strings will help you position the posts, but you'll have to secure each post temporarily before you drill and bolt it in place. Starting with the outside posts for the main platform, use a level to get the post plumb, then tighten clamps onto the metal base **(FIG. 13)**. Make sure the posts are long enough for the railing height you need; they'll be trimmed later.

Next, drive two stakes in the ground and fasten a long brace to each, reaching toward the top of the post. Recheck for plumb, then fasten the braces to the post **(FIG. 14)**. Once the post is secured, drill through the bracket holes and post and install two $\frac{1}{2}$" × $4\frac{1}{2}$" bolts **(FIG. 15)**. Repeat the procedure for the other main deck posts, and attach wood braces between them (near the top ends). These braces help restrain twisting and other unwanted movement of the posts.

Now you're ready for the main beam. If you've got a water level, you can transfer the height of the ledger's bottom edge to mark the beam location on the posts. Otherwise, just set one end of the outer joists in their hangers on the ledger and clamp the other ends to their posts, adjusting the joists until they're level. (Select straight boards for these joists, or the vial on your level will give you a false reading.) At the bottom edge of each joist, scribe a line on each continuous post, then remove the joists.

Some decks feature a large 4x timber for a beam, but two or more thinner (2x) boards are easier to handle and can provide the same load-carrying capacity. They're also

With the post base still clamped, drill through the bolt holes in the metal bracket and install the bolts and nuts.

When the beams go up, clamps hold them until you get height and level adjustments made. Then drill and bolt.

Transfer the joist layout marks from the ledger to the beam, then fasten a hurricane tie at each joist location.

Install the joists at each post first, with the ends flush with the post face. I used Simpson 'SDS' lag screws here.

Use screws to secure the joists in their hanger brackets, and fasten at each hole for maximum holding power.

With a string line to keep the ends of the field joists aligned, fasten them to the hurricane ties and joist hangers.

more commonly available. I used a pair of 2x12's for the main beam, but to accommodate the platform step, I straddled the posts with them rather than mount them both on the same side, which is more typical.

I found it easier to clamp the 2x12's together on sawhorses and drill the bolt holes before positioning them on the posts. As you clamp them in place, check for level, then drill through the posts and install three $^1/_2$"-dia. bolts at each connection (FIG. 16). Note that the beams extend about $1^1/_2$" past the posts so they'll support the outside joists.

With the beam secured, mark the joist layout and install hurricane ties along the inside edge (FIG. 17). These brackets help prevent uplift of the deck platform(s) due to strong winds, and building codes in most areas require them.

After bolting the rim joist to the posts, nail through it into the end of each joist. Check joist alignment as you go.

FITTING THE JOISTS

You're bound to have at least minor irregularities in the ledger wall, so the joists should be custom-fitted one at a time to keep their outboard ends in a straight line. Start by setting the double joists at each post.

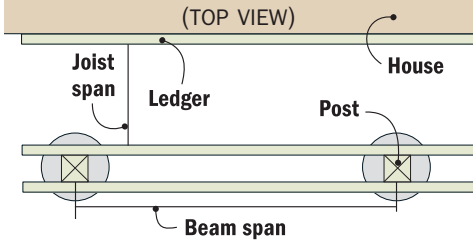
As you install the joists, sight along their edges to check for crook (curved edges). Install any crooked boards with the crown (arch) up, so the tension that makes them arch adds a little extra support.

Because I bolted the ledger directly over beveled siding, it canted toward the house about 5°. I cut the mating joist ends to that angle so they'd butt tight to the ledger and nest fully in the joist hangers.

Using a tape rule to measure for the joist lengths invites errors, so I started with the joists at each post and just set them in place (with the 5° end butted tight against the ledger) and marked the length directly at the post. I cut them so their ends were flush with the outside face of the post, then I drove self-drilling lag screws to secure them (FIG. 18). As you install each joist, fasten it at the ledger end as well (FIG. 19). When you get to the "field" joists (between posts), run a string to keep the ends aligned, and fasten them first to the hurricane tie brackets on the beam (FIG. 20). Close the frame up by installing the rim joist. Use bolts or lag screws to fasten this joist to the posts, then nail it to the ends of the field joists (FIG. 21). Make sure each joist stays aligned as you nail into its end.

SIZING YOUR LUMBER

Below you'll find guidelines for beam and joist sizes for a typical deck frame rated at a "live" load (people and objects on the deck) of 60 lbs. per square foot. Check your local codes to confirm!



BEAM SIZE AND SPAN

(For Grade 2 or Better southern pine)

If the distance between posts:	Use:
• is less than 4 ft.	(2) 2x6's
• is between 4 ft. and 6 ft.	(2) 2x8's
• is between 6 ft. and 8 ft.	(2) 2x10's
• is between 8 ft. and 10 ft.	(2) 2x12's

(For other spans, ask a building official.)

JOIST SIZE AND SPAN

Joist size (nominal)	Maximum Joist Spacing 16"o/c	24"o/c
2x6	8 ft. 2 in.	6 ft. 8 in.
2x8	10 ft. 6 in.	8 ft. 7 in.
2x10	13 ft. 0 in.	10 ft. 7 in.
2x12	15 ft. 1 in.	12 ft. 4 in.

Like the main deck, the tier deck construction begins with bracing posts, then drilling and bolting them in.

The double 2x12 beam for the tier deck gets bolted together inside the posts, rather than straddling them.

The front rim joist for the tier deck is bolted in place, but gets its support from the main deck joists below it.

ADDING OTHER LEVELS

It isn't necessary to have more than one level on a deck, but when there's room for it I always try to add this feature. It makes the deck more interesting and functional, and breaks the building process into manageable sections.

Begin the tier deck frame just like you did the main platform, by bracing and then bolting the posts to their footings (FIG. 22). Again I used a pair of 2x12's for the beam, but this time I bolted them together on the inside faces of the posts, a slightly stronger and more typical arrangement (FIG. 23). This beam sits level with the top of the main deck's rim joist. Because the tier deck joists have a short (8 ft.) span, I was able to reduce the lumber size to 2x8. The height change ends up at $7\frac{1}{2}$". (The Uniform Building Code allows a range of 4" to 8".)

The rim joist at the front of the tier deck frame functions like a ledger board, so it has to be well-supported by the posts and joists of the main deck (FIG. 24). The paired outside joists get bolted or lag-screwed to the posts (FIG. 25), and the field joists install like before — screwed to joist hangers and hurricane ties, and nailed through the rim joists at the ends.

The platform step, one level lower than the main deck, is even smaller than the tier deck, making it possible just to assemble a box frame and install it as a unit (PLATFORM STEP CONSTRUCTION VIEW). This deck section and the cantilevered step below it provide a nice transition from the main deck to the back yard. At its front end (near the step), an intermediate post and footing provide additional support for the platform and for the cantilevered stair joists. I bolted the platform step frame to the main deck after snapping a registration line on the main beam (FIG. 26).

Though there'll be a few minor modifications as the decking goes on, the frames are nearly complete at this stage. You just need to bolt a few intermediate railing posts in place on the main and tier decks (FIG. 27). Counterbore these holes if you're adding trim like I did.

HARDWARE SOLUTIONS: SOMETHING OLD, SOMETHING NEW

Good deck designs demand attention to detail, so it's no surprise that fasteners and hardware will figure prominently in your project's success. Any good hardware store or home center can provide the basics, but we found some specialty products that can make a big difference in strength and appearance. On top of those virtues, many of these specially designed items let you work more quickly.

First, some alternatives to lag screws: GRK offers its 'RSS' structural screws *(A)*, a star-drive washer-head fastener in lengths from $1\frac{1}{2}$" to 12"; the $\frac{1}{4}$" × 3" 'Strong-Drive' screw *(B)* from Simpson features an auger point and a built-in reamer for self-drilling installation. Both are stronger than ordinary lag screws and faster to install.

Hex-head *(C)* or carriage bolts should be galvanized, preferably hot-dipped rather than electroplat-

(A) RSS screw from GRK

(B) SDS ($\frac{1}{4}$" x 3") from Simpson Strong-Tie

(C) Hot-dipped galvanized hex-head bolts

(D) SD8x1.25, Simpson

(E) Stalgard screws

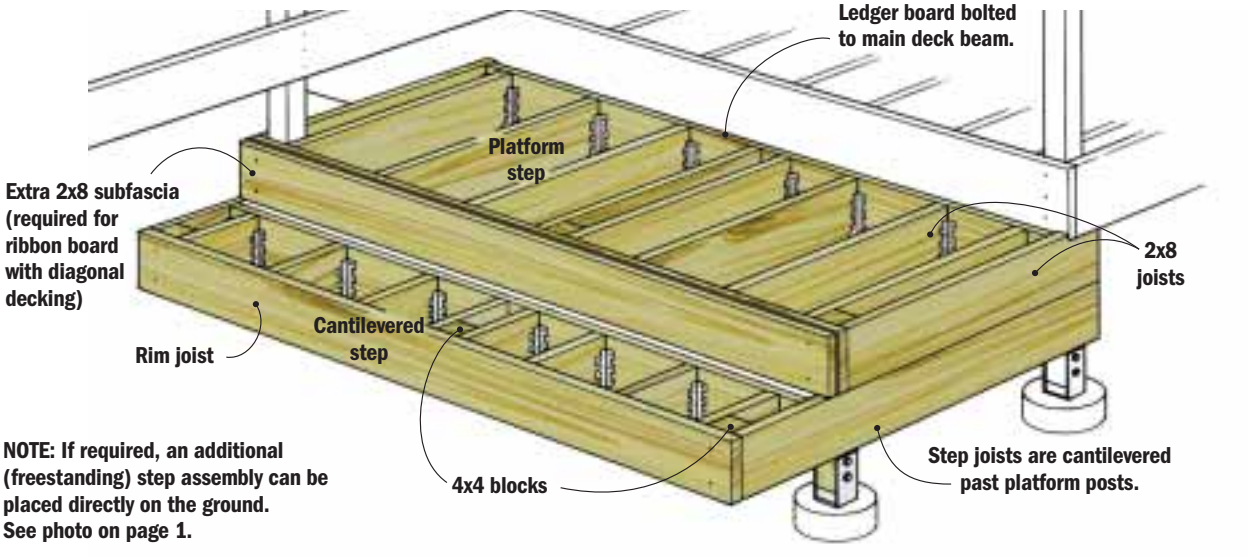
(F) Decking screws

Again, ½" bolts secure all the structural connections, even if a beam or other support is in place underneath.

A chalk line snapped on the front of the main deck beam marks the lower edge of the platform step frame.

Intermediate railing posts (without footings) get bolted between outer joists. Counterbore for the bolt heads.

PLATFORM STEP CONSTRUCTION VIEW



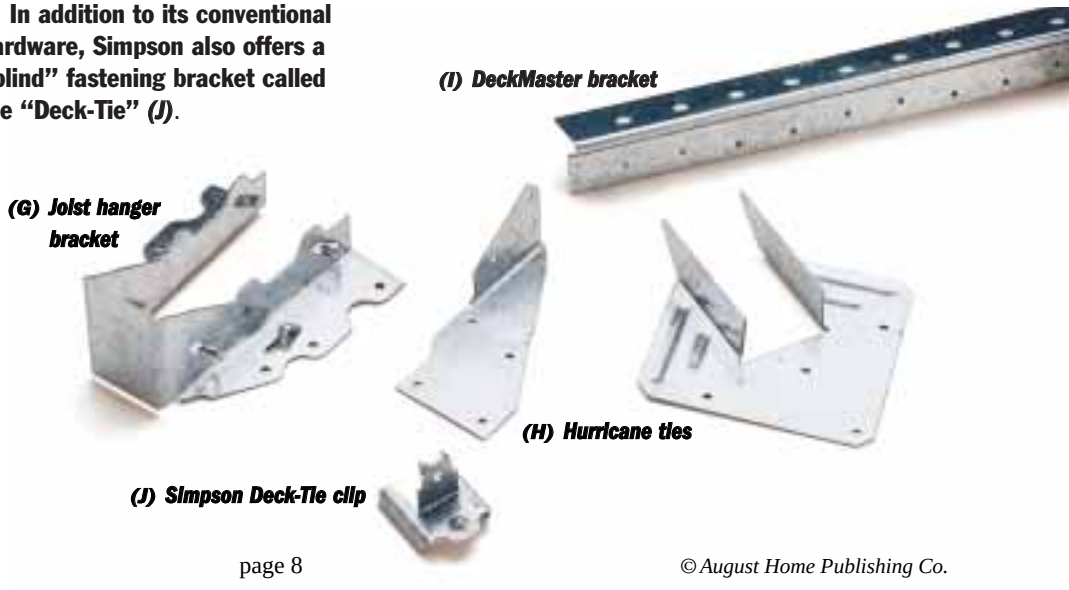
NOTE: If required, an additional (freestanding) step assembly can be placed directly on the ground. See photo on page 1.

ed. The thick layer of zinc resists corrosion much better.

Smaller fasteners make a difference, too. Simpson's needle-point #8 screws *(D)* secure joist hangers and other hardware with virtually no splitting, even at board ends. For exposed fastening, colored screws blend better with decking. Home centers will usually carry a dark red screw like the Stalgard *(E)* for redwood or ipe decking, and a plated or tan-colored screw *(F)* for cedar and pressure-treated lumber.

Mounting brackets and similar hardware include standard items such as joist hangers and hurricane ties *(G,H)*, as well as the DeckMaster brackets I used *(I)*.

In addition to its conventional hardware, Simpson also offers a "blind" fastening bracket called the "Deck-Tie" *(J)*.



DeckMaster brackets get fastened to the joists from the side. Use the holes on top to secure the decking.

The first piece of ribbon decking, like others around the edge of the deck, gets notched to fit around a post.

After routing all the cut edges of the decking with a small roundover bit, apply sealer to the end grain.

LAYING THE DECKING

To me, the open frame of a well-designed deck is a beautiful sight, but when the decking goes down the project really starts to take shape as a design. I chose a Brazilian wood called ipe (*ee'-pay*) from THL Ironwoods (see source list, page 48). Used for years on oceanside boardwalks and other commercial projects, this dense hardwood shares a look similar to mahogany or teak, and has insect- and weather-resistant properties that make it ideal for outdoor structures. Left unfinished, it weathers to a silvery gray, but the deep reddish-brown hue an oil finish gives it can be maintained if you want. Forget nailing this stuff, though. Screws are a must, and you have to drill for most ordinary fasteners or they'll break.

The 1x4 ipe decking I used sells for about $1.25 a lineal foot, roughly the same cost per square foot as clear select redwood or cedar decking. Because it's such a premium material, I used a "blind" fastening system called DeckMaster brackets (see HARDWARE SOLUTIONS, page 42). These brackets fasten alongside the top edge of each joist (FIG. 28), so you can drive screws into the decking from underneath. I was reluctant to try them at first, thinking it would slow down the decking installation too much, but that really wasn't the case, and the clean look they yield is an awesome reward for a little extra work. Plus, the hardened screws furnished with them went into the ipe with no predrilling, a real timesaver.

Rather than leave the ends of the deck boards exposed, I used some of the 1x4 ipe as a ribbon around the perimeter of each platform (DECKING CONSTRUCTION VIEW). These boards got notched and mitered to fit around the posts, with about an $1/8$" gap (FIG. 29). I also routed a $1/8$" radius on all the cut ends (to match the edges), and used an exterior spar varnish to seal the ends against checking (FIG. 30). I fastened the first ribbon board at the front of the deck frame, parallel to the house (FIG. 31). The ribbons at the ends can wait until later.

When you start installing the field decking, use spacers to ensure a uniform gap between the boards, then secure the decking at each joist by driving screws through the DeckMaster brackets (FIG. 32). If the deck's overall length exceeds that of your lumber, let the end splices fall between the paired joists in the frame (FIG. 33). This keeps screws away from the very ends of the boards (reducing splitting), and it allows better drainage.

Unlike the "field" decking, the ribbon boards must be fastened from above with screws. Painted screws blend in.

With a DeckMate to space the boards, the decking gets fastened from below. Note cleat used to keep ends aligned.

Splices add an interesting pattern to the deck surface. Place them over the double joists so water drains through.

Clamps can coax crooked boards into a straight line before you fasten them. Always use spacers for a uniform gap.

Once the decking section outgrows the clamp reach, skip one course and snap a line to start another section.

Work your way toward the house one section at a time. Later, you can go back and fill in the open courses.

WORK IN SECTIONS

With any wood decking material, you'll get crooked boards that need to be coaxed into lying straight. I used a pair of bar clamps for this task (FIG. 34). This works only until the decking section outgrows the clamp's reach, but there's a fix. Stop that section and leave a gap equal to the width of one deck board (plus spacing) and snap a chalk line across the joists (FIG. 35). Leave the gap open (for the clamp heads) and start a new section of decking, then repeat the process when that area grows too large (FIG. 36). Set aside a few straight deck boards as you work, then after you reach the ledger, use them to fill in the gaps.

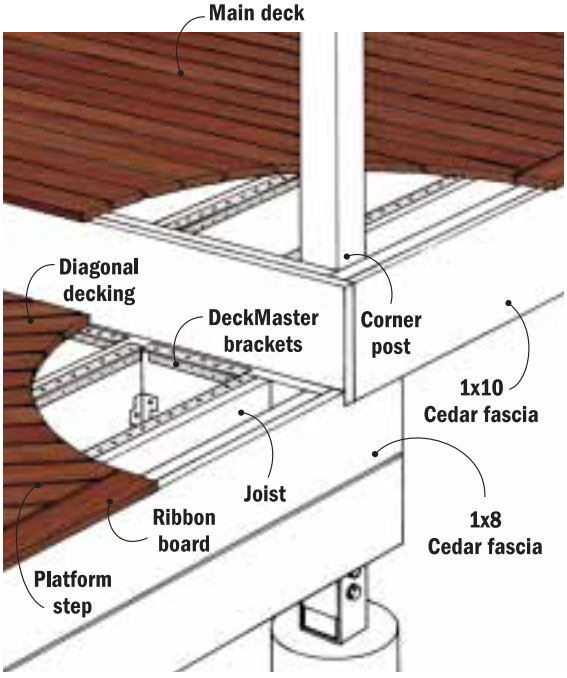
DOING THE DIAGONALS

I mentioned earlier that I think a multilevel deck is a better-looking and more versatile design than one large platform. Installing the decking gives you another chance to add visual interest — by orienting the boards diagonally on the other levels. It also adds safety by providing a visual cue for the change in height.

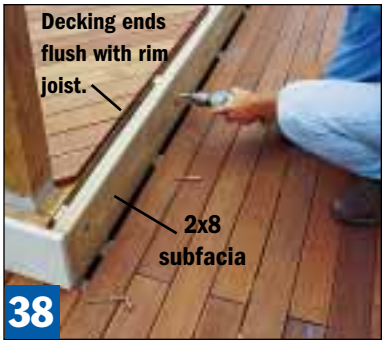
The procedure for fastening the decking diagonally remains pretty much the same, but for some materials the joist spacing must be reduced (see the graphics key in *Decking Options* on page 51). Also, I had to clamp the boards down to keep them from shifting when I drove the screws through the DeckMaster brackets (FIG. 37).

Combining the diagonal decking with the ribbons did require extra subfascia boards for support along some edges (FIG. 38). I stained cedar fascia boards to match the house color, fastened them with screws, then installed the ribbon boards (FIG. 39).

DECKING CONSTRUCTION VIEW



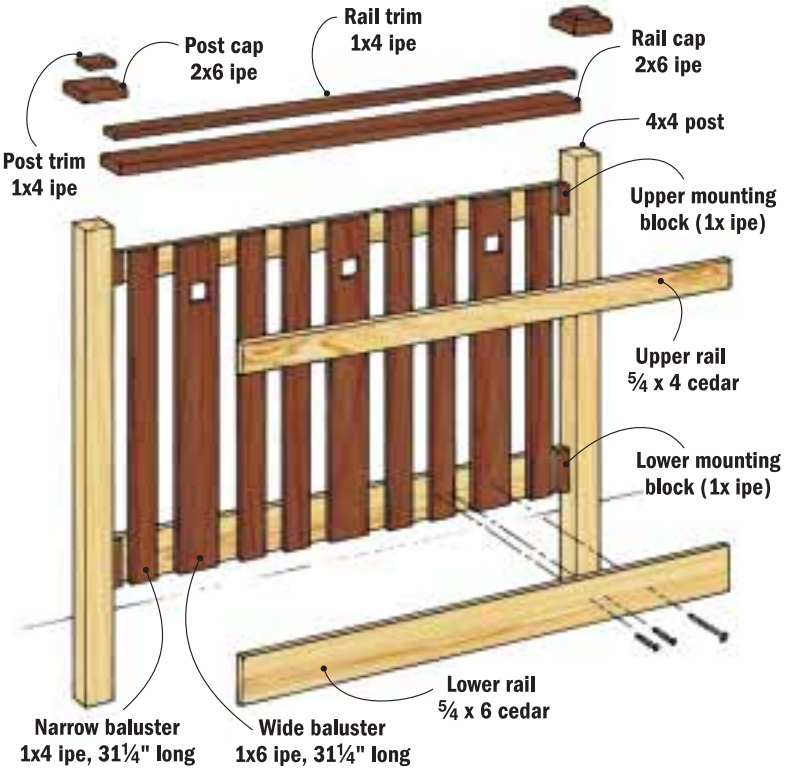
Orienting decking diagonally defines height changes between levels. Use clamps to keep boards from shifting.



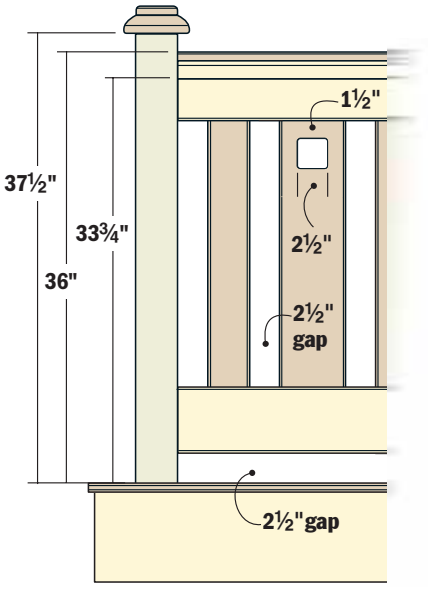
The diagonal decking orientation will require an extra 2x8 subfascia (with ½" spacers) to support the ribbons.

A 1x8 fascia, stained to match the house siding, covers the subfascia before the ribbon boards go on.

RAILING CONSTRUCTION VIEW



RAILING ELEVATION



WRAP UP WITH THE RAILING

If you take time out to indulge in a celebratory dance on your newly installed decking, don't get carried away. Right now there's nothing to keep you from sailing off the edge. The railing will fix that (RAILING CONSTRUCTION VIEW).

This stage of the project ranks among my favorites. You're through shoveling dirt, pouring concrete, and muscling big timbers around. The railing can involve some finer craftsmanship and also tie the deck visually to the house. Start with the railing elements that are already there — the posts. I used a plywood jig (shaped like a 'U' so it supports the saw on opposite sides of each post) to cut them to the correct height (FIG. 40). Then I mounted small ipe blocks for hanging the rail and baluster assemblies (FIG. 41). These blocks support a lot of weight, so I used #10 × 3½" hardened steel screws to secure them.

To add interest to my railing design, I mixed a wider (1x6) baluster into the pattern, and routed a 2½"-square opening near the top of these pieces. The going is slow in the ipe, so I don't recommend details much more elaborate than this. I drilled an access hole and rough cut the opening close to finished size with a jig saw. Then I used a jig and a flush-trimming bit (½" shank for this tough wood) to rout the cleanup passes (FIG. 42).

When it came time to cut the posts to final height, I clamped a plywood jig in place to guide and support the saw.

Mounting blocks made from ipe were fastened to the posts with heavy 3½" screws. These support the railing.

To add the detail to the wide balusters, I used a router jig and a flush-trim bit. Rough out with a jig saw first.

Uniform spacing between balusters is achieved with a simple jig. Check the assembly for square before fastening.

With the upper and lower cedar rails installed on the inside, fasten the railing assembly to the mounting blocks.

Add the cedar rails on the outside to close up each railing section. Painted GRK screws add to the design.

The spacing for the balusters was part aesthetic choice and part legal compliance. (The building code specifies 4" as the maximum width for openings in a deck rail.) Not every railing bay on my deck was the same length, so I figured out a baluster spacing pattern that got me close for all but the one odd run. I made a spacer block jig to help with the assembly (FIG. 43).

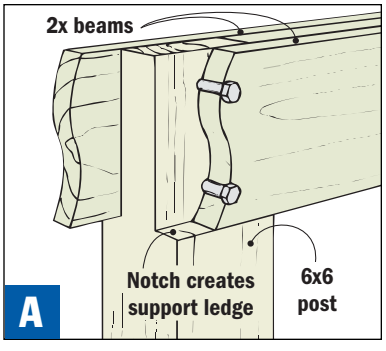
With temporary support blocks positioned at the bottom of each post, I set each railing section (with only the inside rails mounted) in place and fastened it to the ipe mounting blocks (FIG. 44). The outside rails can be added next. When I installed mine, I used painted screws (to match the ipe) as a design accent with the wide balusters (FIG. 45).

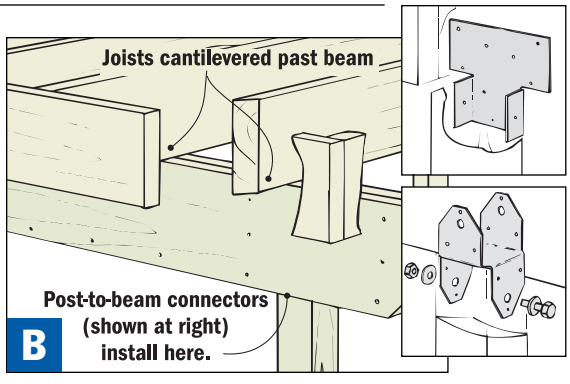
More Deck Details: Post, Beam, and Hardware Options

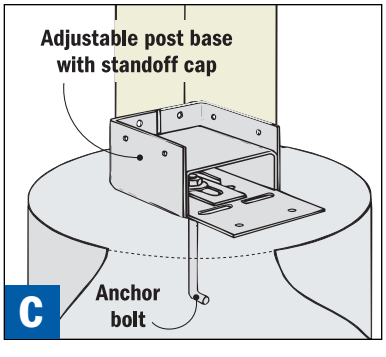
The options you have for your deck aren't limited to its overall design. You can also vary the construction details — the hardware, materials, and techniques you use to put everything together.

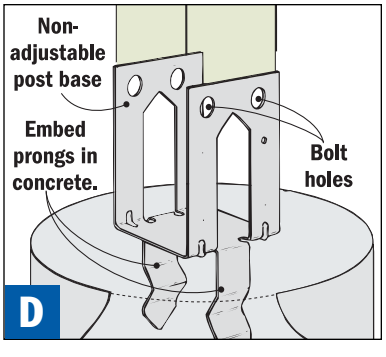
For example, heavy structures or second-story decks need 6x6 posts, notched to create support ledges for the beams (FIG. A). These support ledges can safely support much more weight than bolts can, with less stress to the beam they're carrying.

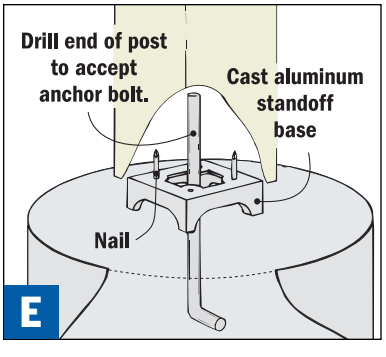
Another option is setting a deck beam directly atop 4x4 posts, with joists cantilevered past the beam (FIG. B). As long as you get the post heights consistent so the beam is level and thoroughly supported, this is a reliable design, and it doesn't require as much precision in placing the footings. The drawback? The railing posts won't be as sturdy as those tied to footings, shown below with some hardware options (FIGS. C, D and E).











After fastening the 2x6 rail cap to the cedar rails, add the 1x4 rail trim. Routed edges offer a friendlier touch.

Use the same sequence to cap off the posts. First, a 2x6 block, then a smaller trim piece cut from 1x4 stock.

For a final touch I applied Penofin oil finish. It brings out the ipe's rich color and will help protect the wood.

CAPPING IT OFF

It's not quite time to fire up the grill and start saucing the ribs, but at this point you're almost close enough to catch a whiff of that first cookout. So how do you wind things up?

First, cut the 2x6 ipe stock for the rail cap and rout the edges with a roundover or table edge bit. These surfaces will get handled a lot, so they should have comfortable contours rather than sharp edges that are likely to splinter. A double row of screws secures the rail caps to the upper cedar rails, and that step is followed by fastening the rail trim (FIG. 46). Installation of the post caps and trim pieces follows the same sequence (FIG. 47).

ICING THE CAKE

Most woods suitable for deck construction hold up well to weather. This is especially true of ipe, but I wanted to finish it with something that would bring out the beautiful color and retard fading from sunlight. The lumber distributor recommended Penofin, an oil sealer highly resistant to ultraviolet light. I brushed on two coats, per the manufacturer's instructions (FIG. 48). What a difference! A nice reward for all the work that went before, and extra protection for the wood.

We took a break, but I soon added planters and benches (also available from PlansNOW) so we could enjoy the deck even more.

When you look at a finished deck like this, it may seem like territory for only the most seasoned DIY'er, not the typical handyman most of us are. Certainly you have to have the tools and the time, but don't let the project's scale intimidate you. No single task is that difficult — you've probably already tackled most of them successfully — so just take them one at a time. Also, keep in mind that "do-it-yourself" doesn't literally have to mean working alone. Like I said, family, friends, and neighbors are all fair game for "volunteer duty." And why not? You know those people will want to show up for steak and suds when all the work's done.

HANDLING PRESSURE-TREATED LUMBER

The widespread use of pressure-treated lumber for outdoor projects has many people concerned about the material's health and environmental consequences. Here is what the U.S. Forest Products Laboratory has to say about it.

Most treated lumber is southern yellow pine that's been saturated with chromated copper arsenate (CCA) inside pressurized cylinders. The preservative retention rate is specified — most is .40 lbs. per cubic foot of wood, rated for ground contact. The FPL says leaching of the chemicals is not significant enough to create a health hazard, but advises simple precautions. Most guidelines are common sense habits — avoid prolonged inhalation of sawdust, wear eye protection, and wash up thoroughly after handling the material. Also, never burn CCA-treated wood — it concentrates arsenic, chromium, and copper in the ash, and releases arsene gas. Re-use is the best option.

There is a friendlier variety of treated wood called ACQ Preserve (for alkaline copper quaternary), that contains no chromium or arsenic. Call Chemical Specialties at (800) 421-8661 for information.

WHERE TO GET IT

SOURCES

- F&S Mfg. (Bigfoot System footing forms) (800) 934-0393
- GRK Canada Ltd. (fasteners) (800) 263-0463
- Grabber Construction Prod. (DeckMaster) (800) 869-1375
- Johnson Level & Tool (DeckMate tool) (414) 242-1161
- Performance Coatings (Penofin oil finish) (800) 736-6346
- Simpson Strong-Tie (fasteners, hardware) (800) 999-5099
- Sonoco Products Co. (SonoTube forms) (888) 875-8754
- THL Ironwoods (ipe decking) (414) 445-8989