Railing Retrofit

BY MIKE GUERTIN

New posts, a cable-rail system, and an applied rim board breathe new life into a weathered deck

When a home needs repairs, there sometimes is also an opportunity to make significant visual or structural upgrades. Such was the case with this deck. The framing was sound, and the pressure-treated decking could wait a few more years until it had to be replaced, but the painted rim and railing were in bad shape. Besides the peeling paint, the railing wasn't too sturdy. The homeowners could have added some fasteners and hardware to strengthen the railing, then scraped, primed, and repainted it. Instead, they decided to take the opportunity to dress up the deck with new ipé posts and rails, cable infill, and ipé trim around the rim. Their decision not only opened the deck to a better view, but it also transformed the whole exterior.

The original railing posts were mounted inside the deck frame and weren't centered on the structural posts beneath. To improve the appearance from the yard, my crew and I mounted the new posts outside the frame and positioned them above the structural columns, roughly 8 ft. apart. Intermediate cable spacers were needed, so we installed 2x4s on edge between the structural posts. To dress up the painted rim joist, we added layered bands of ipé between the posts and cable spacers. Because the homeowners have young children, we kept the old railing system in place for as long as possible.

The detail that had the greatest visual impact and took the most planning, however, was the cable-rail system. Thankfully, these systems have come a long way since I started in this business.

Ideal system for retrofits

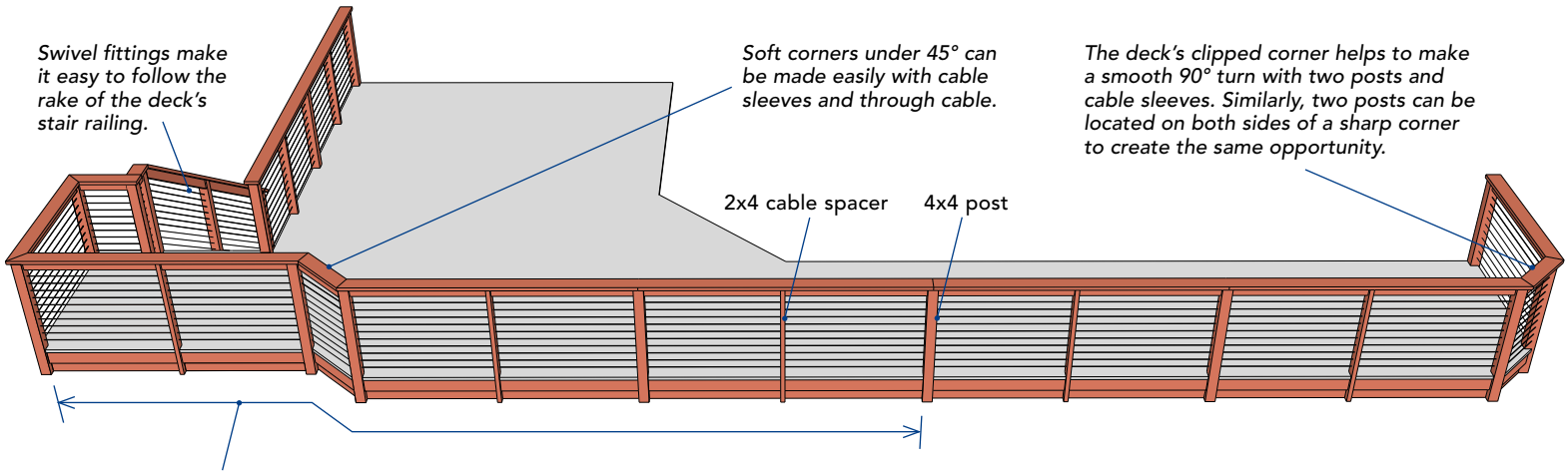
Twenty years ago, I cobbled together a cable-rail system from sailboat-rigging hardware. It was functional, had an airy feel, and opened the deck to the backyard; however, installing the shackles, cleats, and turnbuckles was clunky, to say the least. Today, there are several slick cable-hardware systems either

Drawing, bottom photos, facing page: Rodney Diaz

3 FITTINGS TAME DESIGN CHALLENGES

Cable rails are subject to the same building codes as other deck-baluster options, with an important caveat: Spacing needs to account for how much the cables will flex when a force is applied. Therefore, spacing between cables is typically 3 in., and the distance between structural posts is either reduced or offset with nonstructural cable spacers. The final design considerations are corners and the length of cable runs, both of which make it challenging to take the slack out of the cable.

While there is a dizzying array of cable-rail hardware parts on the market, system basics are pretty common and straightforward (see "Durable Deck Railings," pp. 60-63). The cable is typically 1x19 type and ranges from ⅛ in. dia. to 3⁄16 in. dia. Other cable braid types are more flexible than 1x19 type and spread apart too much under force to be good choices. Fittings for attaching cables to posts come in different styles, including surface mount, lag mount, and through post. These fittings serve two basic functions: to attach the cable to the post and to tension (or tighten) the cable. As seen in the drawing, at least one end of each cable run needs a tensioning device. The hardware shown here is from Atlantis Rail.



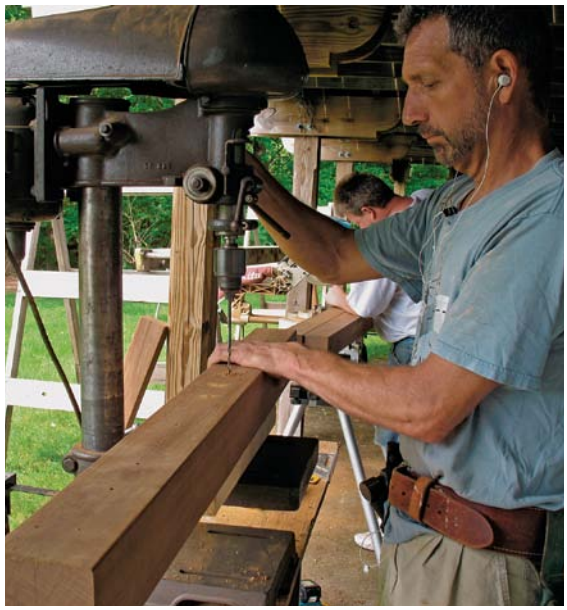
On this project, the longest cable run is 48 ft. Cable runs either terminate at 90° corners, or corners are made in two 45° (or less) turns. Finally, 2x4 cable spacers halve the distance between structural posts. All this is done with three simple fittings: a swivel end, a cable sleeve, and a cable tensioner.

POSTS AND TOP RAILS COME FIRST

To create a robust structural support system capable of resisting the cable's tension, the author bolted new 4x4 posts to the deck frame, installed a subrail between the posts, and tied the whole structure together with a continuous top rail. The cables are spaced 3 in. apart and run through holes drilled in the posts and through intermediate cable spacers. It's important to keep the holes aligned precisely and perfectly straight through the posts and spacers. It's easier and faster to bore accurate holes through posts and spacers using a template and a drill press before mounting them to the deck frame.

Template shows the post layout. *Use a piece of plywood marked with the entire post layout for a template. Top and side stops register the template to the post. Mark the centerline of the post, and drill ⅛-in. holes to identify where cable will run through. The template also can be used to locate pilot holes for hardware mounting screws, which may or may not be necessary, depending on the density of the wood being used and the type of hardware.*

Mark with a nail set. *Rather than marking posts with a pencil or using the template as a drill guide, use a nail set to dimple each cable location. Dimples are easier to see than pencil marks, and they center the drill bit for precise boring. Some cable-rail companies have layout templates stamped at standard 3-in. centers.*



A big machine makes perfect holes. *For the precision holes required for cable rail, it's worth using a drill press if you have access to one. If you don't, bore holes through the post from each side so that the entry and exit points are aligned and any drift is in the middle of the post. Use drill bits 1/32 in. larger than the cable diameter.*

Mount the posts to the rim. *Earlier, the author used a drill press to bore 9/16-in. pilot holes 2 in. down from the top and 2 in. up from the bottom of the post. In the next step, shown here, he used the straight pilot holes to guide a 9/16-in. drill bit through the framing. He used ½-in. hex-head bolts and rim-to-joist hardware mounted inside the frame to resist outward force. (For more on securing rail posts, see "Start Your Railing Right" on pp. 27-29.)*

Subrail resists tension. *The subrail is critical to maintaining cable tension. Without a subrail between posts, the cables would pull the end posts inward. Here, a 2x4 subrail is pocket-screwed on edge between each pair of posts using structural screws. A simple plywood jig is used first to guide pilot holes and later to register the subrail for installation. With the subrail in place, the nonstructural 2x4 cable spacers can be notched to fit around the subrail and fastened to the rim with structural screws.*

Flash forward. *When cable enters or exits a post at an angle, sleeves are needed to protect the wood. Rather than oversizing holes for the sleeves during the production boring process, the author drills out the larger holes after the posts are in place. The cable sleeves require a countersink to accept the flare at the end.*

Cap rail ties it all together. *You can use 5/4x6 decking or 2x6 stock attached with screws for a top rail. The resulting "T" between the cap rail and the subrail forms a strong top-rail system. Joints can land on top of a post or along a subrail span. Use dowels or biscuits to keep the joints tight and cap-rail pieces in plane with one another.*

adapted for or specifically designed for deck railings. Some cable systems are integrated with structural metal post-and-rail assemblies; others can be used with site-built wood posts and railings. In most cases, I've found that the material in cable railings costs less than nice wood or manufactured deck railings. Once you learn the basics, the labor to install cable systems is actually less than that for other types of guardrails.

I prefer the versatility of hybrid cable-rail systems—that is, systems that can be used with wood posts and top rails. These systems give you the freedom to design a guardrail suitable to each project, including deck remodels like this one, and to design custom details. These systems rely on sturdy 4x posts and a top rail that can resist the inward tension of the cables. On this project, I used the Rail Easy system from Atlantis Rail (www.atlantisrail.com; for more manufacturers, see pp. 60-63). I usually include a subrail in my designs for extra strength. Here, the subrail is a 2x4 installed on edge, but you also can use 1x or 2x stock flat between posts. Sometimes it looks nice to add a bottom rail between structural posts and to position cable spacers between the top rail and bottom rail (more on cable spacers in a bit).

Most cable hardware is pretty straightforward. At one end, the hardware fixes the cable to the post and is generally not adjustable. At the other end, the hardware—called a tensioning device—can be tightened to take the slack out of the cable. Cable-rail hardware mounts in a few different ways, including surface mount, lag mount, and through post. Through-post systems may be difficult to work with after some posts, such as those close to the house, are installed.

Planning runs and corners

Cable rails have to meet the same building codes as any other deck balustrade in that the space between them cannot exceed 4 in. Because cables flex, there are limits to how

far they can span between deck posts or spacers. The combination of cable spacing and post spacing, along with cable diameter and tension, must be balanced to account for cables spreading apart under force. Manufacturers save us the trouble of making complex calculations by publishing guidelines for cable spacing and support-post spans.

The most common cable spacing recommended by manufacturers is 3 in., and the span limit between structural posts and cable spacers is between 3 ft. and 4 ft. Some manufacturers permit wider post and spacer spans with corresponding reductions in cable spacing. Manufacturer-recommended cable runs between termination fittings range from 50 ft. to 65 ft., depending on whether the cable runs keep straight or turn corners. Here, I used a combination of structural 4x4 posts and intermediate 2x4 cable spacers to keep uninterrupted cable runs under 50 ft.

Corners can be handled a few different ways depending on whether you want to mount posts inside or outside the deck frame. To turn a 90° corner at a single post mounted inside the frame, the run in each direction has to terminate on that post. Double posts are needed outside the frame to turn a 90° corner if you want the cable run to be continuous. Cable-rail hardware manufacturers offer sleeves to line the holes in posts where a run of cable turns. The sleeves prevent the cable from tearing into the wood. These sleeves also can be used to maintain a continuous cable run through corners under 90°. Sleeves are not needed on straight cable runs.

This project had hard 90° corners, clipped 90° corners, and a soft corner (under 90°). I used a combination of techniques to make the turns, as you can see in the plan. □

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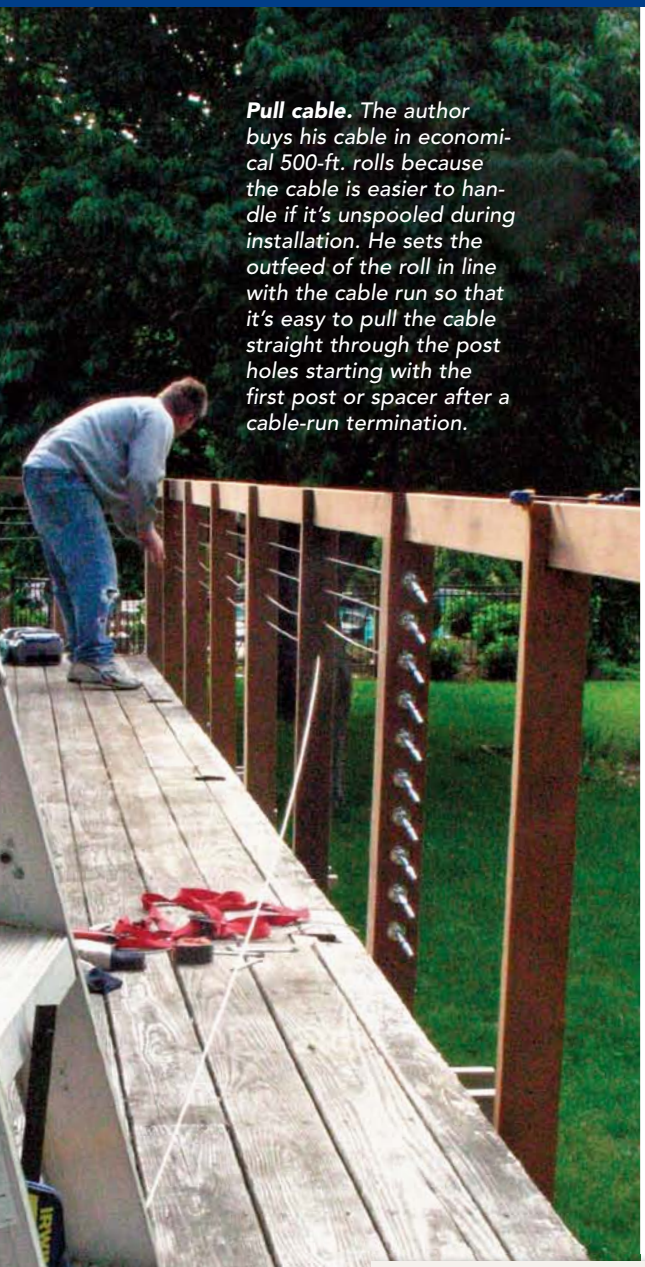
CABLE INSTALLATION GOES QUICKLY

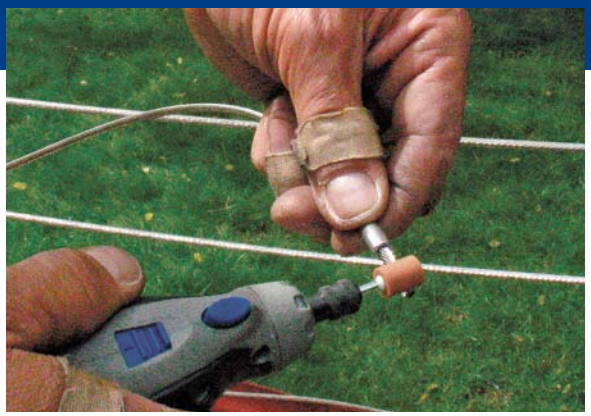
With the posts and spacers bored and the hardware pilot holes driven, it's time to install the hardware and to pull and tension the cable. There are nuances to working with each manufacturer's hardware, but the general process and tensioning sequence is the same.

Install cable sleeves. *Swipe the holes bored earlier with a piece of sandpaper to clean off any wood fibers and to allow the sleeve to sit nicely in the post. Gently tap the sleeves into position.*

Mount all the hardware. *The surface-mounted swivel fittings and tensioners shown here are mounted to the posts before pulling and cutting the cable. Because of this, you can mount all the hardware at once. Be careful not to snap or strip the stainless-steel screws by driving them too fast into hardwoods like ipé. Bored deep enough, pilot holes save headaches if they prevent even one broken screw.*

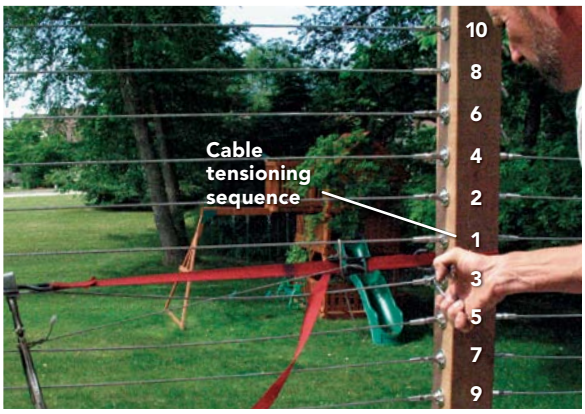


Pull cable. *The author buys his cable in economical 500-ft. rolls because the cable is easier to handle if it's unspooled during installation. He sets the outfeed of the roll in line with the cable run so that it's easy to pull the cable straight through the post holes starting with the first post or spacer after a cable-run termination.*



Anchor clean cable ends. *It's important to have clean end cuts on the cable. If any cable strands are bent or have burrs, clean their ends with a grinder, or recut the cable. Attach one end of the cable to the fixed fittings.*

Tension cables in order. *There are two steps to tensioning cable: first, by hand, and then by tightening the tensioning device. On long runs, hand-tensioning doesn't get the cable tight enough, so the author uses a ratcheting device and a pair of locking pliers to pull and hold the cable tight. Loosen the tensioning device before attaching the cable so that you'll have the greatest adjustment.*



There's a sequence. *Once all the cables have been finger-tightened, begin the real tensioning. That's generally done by holding the receiver cone immobile while turning the tensioner body. This manufacturer recommends tensioning the center cable first, then alternating between the cables above and below until reaching the top rail and decking. Others specify starting at the top and bottom cables and alternating toward the center.*

TRIM DRESSES UP THE RIM

The final step in upgrading this deck's railing was to install ipé trim between the posts and spacers to conceal the old pressure-treated rim.

Stepped trim, hidden fasteners. *The trim was attached with Starborn's Pro Plug system of countersunk wood screws and plugs (www.starbornindustries.com). Two boards were used to create a shadowline. The top board was padded out with a rip of pressure-treated decking. A new pressure-treated deck board will be fit to overhang the trim by an inch, but that's a temporary solution. The next phase of this deck upgrade will be to replace all the decking.*