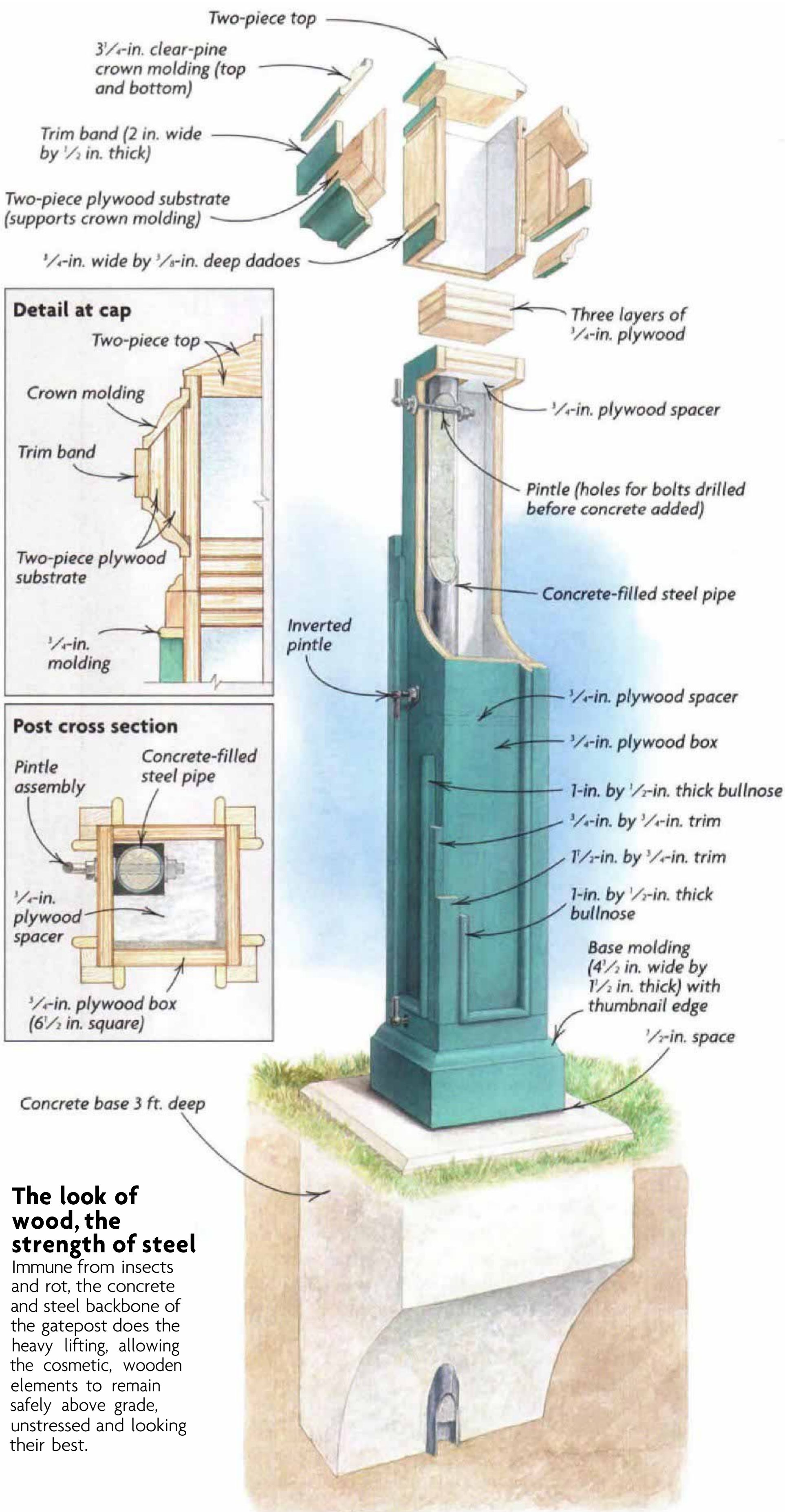


The look of wood, the strength of steel
Immune from insects and rot, the concrete and steel backbone of the gatepost does the heavy lifting, allowing the cosmetic, wooden elements to remain safely above grade, unstressed and looking their best.

A Gate That's Built to Last

Weather-resistant construction means this driveway gate will stand up to Rocky Mountain storms for years to come

BY ANDY BEASLEY

Where I live in the Rockies, everything is on a big scale. The elevation is 8,000 ft. above sea level, and the mountains behind my house rise 5,000 ft. higher still. The views are virtually limitless, deer and elk pass through in herds, and the stars at night are countless. Unfortunately, the weather is big, too. Winters are bitterly cold, the snows deep and the wind ferocious. All in all, it's a wonderful place to live, but a tough place to build anything that will stand up to the elements. When it came time to design a new gate for the lane to my house, I was determined to build something that not only looked good but also was going to last. I don't mind a little routine maintenance work. But as a recent retiree, I don't relish the thought of a rebuilding project some time in the future when I might be moving even slower than I am now.

A wooden gatepost with a backbone of steel

More than anything else, the longevity of my gate depends on the structural design of the

Drawings: Gary Williamson

Elegant and rugged just like its surroundings. It may not last as long as its towering neighbors, but solid underpinnings of concrete and steel should serve this gate through many Colorado winters.

gateposts. I wanted to build a traditional wooden post featuring inset panels and built-up moldings. But I swore that I'd never again throw out my back trying to wrestle a rotten mass of wood and concrete out of the ground.

My solution was to create a two-part post that would consist of a concrete-reinforced galvanized pipe at the core surrounded by a built-up wooden box (drawing facing page). Resembling a Popsicle on a stick, all the cosmetic wooden parts would be safely above grade, while the concrete-and-steel backbone would extend deep into the ground.

The backbone is a 7-ft. length of 2⅜-in. galvanized fence post stock. The concrete, which stiffened the steel core so that it wouldn't flex under the load of the gate, was poured 6 in. short of the bottom to allow me to trim the pipe to length later.

The body of the post is a rectangular box made of ¾-in. ACX plywood. After back-priming all the pieces, I used corrosion-resistant screws (McFeely's Square Drive Screws; 800-443-7937) along with biscuits and exterior carpenter's glue to assemble the box. I also sealed the openings around the hinge bolts with an epoxy filler and used black Rust-Oleum paint (800-323-3584) to protect the hinge parts against rust.

Once the carcase was assembled, building the remainder of the post was straightforward woodworking, the only differences being the weatherproofing measures I took: I selected redwood for most of the trim due to its resistance to decay, and I back-primed every piece before installation. I used weather-resistant fasteners and covered them with redwood plugs, exterior wood filler or other layers of trim. As a last step before priming and painting the posts, I ran a thin line of caulk along horizontal joints where water might seep in.

Fast-setting concrete anchors the posts

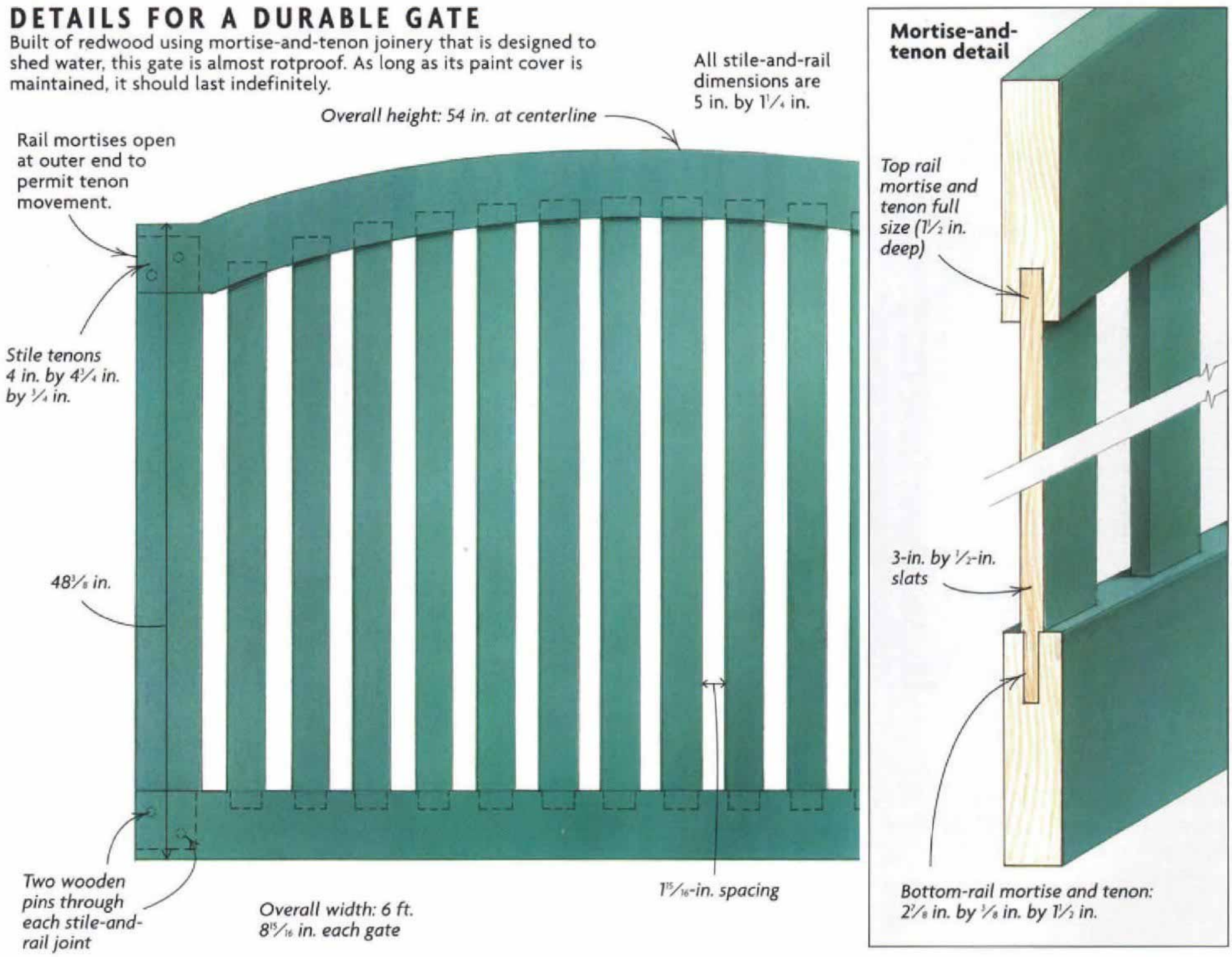
Despite what historians may tell us, I'm convinced the Rocky Mountains were named not by some explorer gazing at their rugged heights but by some poor soul digging post holes. I was fighting rock all the time I spent digging the first hole but eventually managed to reach the full 3-ft. depth I'd hoped for. By placing stone shims under the bottom of the pipe, I was able to adjust the height of the post until the base was at the appropriate elevation above grade.

I did not want to mar the finished post with temporary bracing, nor did I want to give the fierce Rocky Mountain winds much time to dislodge my creation. So I used a fast-setting concrete (Quikrete; 800-282-5828), which sets up in minutes rather than hours. To prevent water from wicking into the post, I stopped the concrete pour about ½ in. below the bottom of the base molding. After I spent a relaxing 15 minutes holding the post plumb, the concrete was sufficiently cured, and I was then ready to move on to the second post.

Digging the second hole was harder than the first. When I hit solid rock a few inches shy of 3 ft., I was glad I hadn't filled the steel pipe completely with concrete. After a quick hacksaw cut, I set the second post much as I

DETAILS FOR A DURABLE GATE

Built of redwood using mortise-and-tenon joinery that is designed to shed water, this gate is almost rotproof. As long as its paint cover is maintained, it should last indefinitely.



did the first, except this time I used a builder's level to ensure that the height of the second post exactly matched that of the first.

Concrete pads fully support the gates

I didn't want to have to cut or plane the finished gates to make them fit, so I held off building the gates until I could take exact measurements between the posts. The design I'd chosen was a simple but elegant stile-and-rail frame with vertical slats and an arched top.

I used mortise-and-tenon joinery to connect the redwood rails and stiles, and to anchor the vertical slats in the top and bottom rails (drawing above). When working with the curved top rail, I found it easiest to cut the inside curve first and then to lay out the full-size mortises square with the straight top edge. With the blank upside down on its straight edge, I drilled and chopped out the mortises before cutting the outside curve on a bandsaw. Because the slat-to-bottom rail connection was a likely place for water to penetrate, I made sure that the tenon shoulders mated exactly with the upper surface of the rail, and I caulked around each joint so that it would shed any water running down the slats.

After both gates were assembled, primed and painted, the bulk of the work was behind me, but I felt as if all my labor until that point had been merely a prelude to the real make-or-break stage of the project: hanging the gates.

My design for the gates purposely did not include an unsightly diagonal of one sort or another to prevent the gates from sagging. My alternative was to pour concrete pads to support the free-swinging ends of the gates beneath their open and closed positions (top photo, facing page). Because this method limits the stress placed on the posts as well as the gates, I expect it will significantly increase the life span of the entire assembly.

I started this part of the job by excavating for a 24-in. deep concrete pad directly under the point where the two lock stiles would meet when the gate was closed. With my wife's cheerful assistance, we placed both gates in position, aligned their bottom and top rails, and clamped them together when the gap between the lock stiles was a consistent $\frac{3}{16}$ in. Treating the double gates as a single unit, I found it easy to adjust a few underlying shims until the gates were level and in perfect relationship with the posts at each end. I then marked both hinge stiles for their hinges and also leveled the concrete form in the middle.

With the concrete cured and the top and bottom hinge straps attached, I hung each

A fully supported gate. With their free-swinging ends resting on concrete pads when they're open and when they're closed, these gates have to carry their own weight only when they're swinging (photo above). To bolster the gate against high winds, whether open or closed, 5-ft. long steel rods descend half their length into the concrete pads.

gate by lowering the hinges onto their mating pintles (hinge pins). I installed the center hinges after the gates were hung because I'd inverted their pintles, as a security measure, to prevent the gates from being lifted off their hinges. To support the gates in their open position, I swung them open, shimmed them level and poured concrete pads under each one.

Steel rods brace the gate against strong winds

Living in the mountains means living with extreme winds, so one of the details I added was a trick I'd learned from my grandfather, an old Colorado cowboy. On the backside of the lock stile of each gate, I mounted a sliding steel rod to align with a PVC sleeve that I had placed into each of the concrete support pads before they were poured (photo right). When the gates are fully open or fully closed, the steel rods slide 2½ ft. down into the concrete pads to resist the wind's torque and to keep the gate from literally being blown away.

The last detail I added was a ⅛-in. thick galvanized-steel wear strip, which I fastened to the bottom of each gate where it rests on the concrete supports. This wear strip not only protects the wooden bottom rail from abrasion but also prevents the gate from contact with wet concrete.

I haven't thought of everything, of course, but the design and construction of this gate should help it to last a long time. My only problem now is the resurgent bluebird population, which finds the gate a perfect spot to sit and, er, sing on a grand scale. ❑

Although officially retired, Andy Beasley works full time at his home high in the Rocky Mountains near Hillside, Colorado. Photos by the author.