13.3 Installing Gates [Excerpt]

This may sound intimidating and indeed it is before doing it the first time. In fact, installing gates is quite easy when done correctly and can be accomplished in just a few hours.

Experience: Do It Right the First Time – Early on, we made mistakes with gate installations that resulted in many replacements. This is how to get it done right the first time with gates that work for many years.

Managing Gates

They're only effective for animal and human control when opened and closed correctly. This requires discipline by everyone who can pass through the gate—open and close behind—every time. Make sure everyone knows when and how to do this—especially kids when they get exuberant. Show them how the gates work and how to secure them correctly. Otherwise, the animals will exploit the opportunity.

Preps for Installation

Where to Install Gates

Consider this carefully. Gates must be in the best locations and with the correct openings. Think of every possible scenario for using each gate—now and in the future. Visualize how it will be used, by whom, and in what way—one-handed, with tools, with equipment. Remember, once a gate is properly installed it's not going anywhere—get it right and involve everyone in decisions. If not sure with niggling thoughts, pause before proceeding and discuss again.

When to Install Gates

Gates, with posts and braces, are anchoring points for the fence, the same as corners and bridge posts. All of these must be installed first before anything else happens with a fence project. Otherwise, gates can be added later without jeopardizing the integrity of the fence.

Number of Gates

These exist for both convenience and to control movement. No matter the property, layout, or situation eventually there will be lots of gates.

Experience: Number of Gates – On our five-acre homestead, we have 24 gates:

4-foot – 3 each 6-foot – 8 each 8-foot – 6 each Custom – 7 each

Topography Considerations

Gates can be installed on slopes, but will only swing one way—downhill. Consider this in your planning.

Obstructions

This especially applies to what you can't see. If trees are nearby, expect roots. If you're in glacial areas, expect rocks. When digging the post holes, you may encounter something too big to remove. Fill in the hole and reposition the gate.

Types of Gates

Farm Gates – These are welded tubes and very strong. They come in two-foot wide increments starting at four-feet with the correct height for commonly used fencing. They also come with a chain closer that includes a welded piece with a groove. They're rugged and take the abuse that happens on homesteads—use these gates.

Homestead Gates – There are situations where custom gates may be required. When built correctly with the right materials, they can function reasonably well. See the details at the end of this section.

Wood Gates – Do not attempt heavy wooden gates, wide enough for tractors. In short order they sag. It is possible to keep them upright and functional, but with far more effort and material than farm gates. Plus, there would be constant recurring maintenance—never a good idea on a homestead.

Gate Posts

Raw Wood – Do not use this, no matter how rustic and aesthetic they many appear. These are always prone to insect damage, almost impossible to obtain in straight pieces, and difficult to mount gates.

Correct Wood – Ground-contact pressure-treated 4x4 lumber—none of the above problems. It's more expensive than free wood, but the gates *will* work for many years.

Gate Bolts

Free Hardware – Farm gates come with two screw-in type hangers. Do not use these—they will fail. These bolts tend to work loose and do not tighten up again. Plus they're difficult for lining up gates.

Correct Hardware – Instead, use special bolts that go through the gate posts. These are available at farm stores, make gate installation much easier, and the gates swing correctly. They're a bit pricey, but worth every nickel with none of the above problems. These are shown in various photos.

Wrong Gate Bolts. The original mounting hole was abandoned when the bolt worked loose. Using raw wood for the post likely contributed to the failure.

Rusted Gate Bolts. These were found after only 12 months out in the field. Being mounted in fresh raw wood likely contributed to the rust. This does not happen with correct materials and hardware.

Photo 13.3.1-1 (b)

Photo 13.3.1-1 (b)

Materials Required

Gate: 4-feet wide and Up / Two-Foot Increments	Gate Bolts, 2 each / ⅝-inch / Match to the gate
Ground Contact Lumber: 4x4x6 foot / 4 total / 2 for each side of the gate	
Lag Bolts with Washers: 3/8 x 6 inches / Galvanized / One set for each brace	
Concrete Mix / Quick Set / 50-Pound Bag / 2 each	Scrap Wood / To brace the posts / 2 each
Scrap Lumber / Several Short Pieces / Different Depths / Enough for two stacks	

Tools Required

Spade Shovel	Post Hole Digger	Torpedo Level
Drill and Driver	Spade Bits / ⅜ and ⅝-inch	Socket Wrench for Lag Bolts
Crescent Wrench, Medium	Tape Measure	Speed Square
Utility Scissors	Gallon Jugs of Water, 2 each	Buckets / For Excess Soil
1¼-Inch Screws, 2 each	2½-Inch Screws, 4 each	Pencils
Sharpie Marker	Gloves	Tool Box or Bag

Spade Bits – There's a new type of bit available with a threaded screw point. This pulls in the bit making the cut much faster and more accurate, especially in treated lumber. Highly recommended.

Procedures – Installing Posts and Hanging Gates

Step 1

Preps for Installing the First Post

Double check plans to make sure the gate is where it should be. At the site, check for possible buried obstructions.

With the spade shovel, mark the location for the post with four spade cuts into the soil. The hole should be about 8 inches in diameter.

With the spade, loosen up chunks of soil. With the post hole digger, grab and drop out of the way.

Use the spade to measure for the correct depth. When the hole reaches the top of the spade, an 18-inch hole will be ready for the post.

Post Hole Prep. Spade and post hole digger.

Photo 13.3.1-3 (b)

HOMESTEAD TALE – One day when out and about, we encountered a new homesteader attempting to dig holes for a fence with his post hole digger. It wasn't pretty as he kept hacking at the clay soil. We had to stop and offer advice. He dropped the post hole digger and went for his spade. Be a good neighbor and point nice folks in the right direction. Today, his fence looks great, even if it is with wood posts.

Step 2

Place the First Post

Move the bag of concrete next to the hole and cut it open the with utility scissors. Scoop out enough to make about a 1-inch-thick base for the post at the bottom of the hole. Drop the post into the hole on top of the base. Get it square to the line of the fence.

Screw the two scrap pieces to the post to hold it vertical in both directions. With a boot, jam the supports into the ground enough to be snug.

Using the torpedo level, check for vertical in both directions. Adjust the supports as needed and check again.

Keep the torpedo level at hand throughout the next step.

Placing the First Post. Braced to vertical.

Photo 13.3.1-4 (b)

Step 3

Secure the First Post with Concrete

Hand scoop about four-inches of concrete into the hole around the post and add a moderate amount of water. As concrete is added, keep double checking for vertical. Continue layering with concrete and water until the hole is filled.

Add extra concrete around the post about one inch above the surface of the ground. Using hands, taper this from the post to the ground and over the entire hole. This adds extra protection

for the post against rain water runoff that might otherwise seep into the hole.

The post is now where it will be and cannot be moved. Remove the temporary braces.

Secure the First Post. Keep checking for vertical as the concrete and water go in. This is a one-shot opportunity.

Photo 13.3.1-5 (b)

Dimensions

This next step is very important to get right. At first it was quite confusing with lots of measuring. The following should help make the installation a lot smoother and easier. This assumes that the first gate post is installed and the gate is at the site. These determine the location of the second post.

Uniformity – All farm gates, like those shown, have the same basic dimensions. This is so a gate can be replaced without rebuilding the posts and fencing. This has been ongoing for many years.

Width of Gates – These are not exactly at the stated dimensions. The following table provides what to expect and applies to all currently available (in 2024) tube-type gates at 4, 6, and 8 feet as ascertained from actual installations. Larger gates are available with the same configuration. Simply allow for the wider width with the same type of hinges, location of hinges, and size of bolts.

Gate Bolts – These need room between the gate hinge and the mounting gate post. These bolts are threaded with double nuts and washers for tweaking so the gate swings neutral and for adjusting to clearance on the second post. These are very effective for maintaining gate operation when soil shifts and gate posts settle. They're expensive at about $20 each but well worth the investment.

Second Post Location – The distance between the gate posts is from the inside of each post, not to the center of these posts. As you dig the hole for the second post, keep checking to be sure of the correct clearance. This is not an exact procedure, just make sure the hole is no larger than necessary.

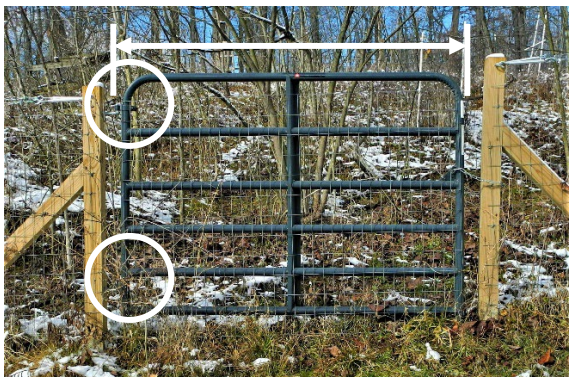
Gate Size	Actual Width	Bottom Bolt Position	Between Bolts	Between Posts
4 foot	46"	9 inches from the ground provides about 4 inches of clearance	36 ¾ inches	50-52 inches
6 foot	71"		36 ¾ inches	74-76 inches
8 foot	93½"		38 ½ inches	98-100 inches

Step 4

Install the Second Post

Verify the width of the gate on hand against the dimensions shown on the above table. It helps to stand the gate in position to be sure. The point is to not have big gaps at the posts, but also not too small—it has to swing freely.

Mark this spot with the spade shovel. This should be from the inside of both posts.



Set the second post following Steps 2 and 3.

Placement of Second Post. Note the clearance on both sides of the gate—about two inches.

Photo 13.3.1-6 (b)

Experience: Quick Setting Concrete – This firms up fast in about 30 minutes, strong enough to install the fence braces, but not enough for loading from fencing. That requires full curing—about 24 hours.

Step 5

Preps for Installing the Braces

These cannot interfere with installation of the gate bolts. Generally, the top bolt should be on top of the brace, but be certain with a rough mark on the post by prepositioning the gate.

Each brace will be at 45 degrees to the post with the length determined by topography--shorter uphill and longer downhill. Mark each brace so the right one goes in the right location. On the flat, the braces will be the same.

Dig a shallow saddle hole where the brace contacts the soil. Keep adjusting the hole with the trowel until the brace rests flush with the post.

Replace excess dirt and boot stomp around the saddle hole.

Repeat for the other post.

Good Brace Location. Note how the brace does not interfere with the top hinge bolt.

Photo 13.3.1-7 (b)

Experience: Installing Braces – Save a trip by cutting the end of the brace pieces at 45° before traipsing to the gate site. Then dig in the saddle accordingly. With six-foot posts, this allows enough room for the gate bolts to be installed.

Step 6

Install the Braces

Tack the brace to the post with 2½-inch screws.

Mark the ⅜-inch spade bit at 6-inches. Measure from the pointed tip to keep from penetrating the vertical post with the hole.

Position the hole about three inches from the top of the brace. Check against the side of the brace and post to ensure the hole will not penetrate.

Drill perpendicular to the brace. Pull out frequently to remove cuttings and keep from jamming the drill. Stop at the mark on the bit.

With the socket wrench and washer on the bolt, work it down into the hole. It should be snug and tight. Tack screws can remain in place.

Repeat for the second brace. Clean away excavated dirt and move digging tools out of the way.

Installed Brace. 2½-inch screws tack the brace to the gate post. Six-inch lag bolt installed perpendicular to the brace into the gate post.

Photo 13.3.1-8 (b)

Step 7

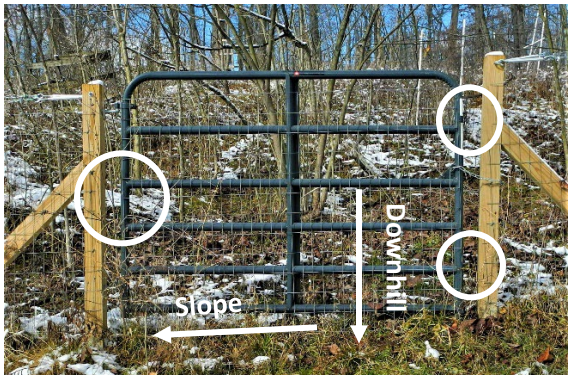
Preps for Installing the Gate Itself

Now is time for determining how the gate can and will work. The big decision will be on which side to mount the hinges.

Look over the site from both sides—envision how the gate will be used and which way it will swing most often. Pantomime which hand will do what when working the gate. Keep in mind that gates on a slope only swing fully open downhill.

When satisfied, lift the gate next to the selected hinge post. With scrap wood, build two stacks to get the gate parallel with the posts while not interfering with the brace. It helps to have an assistant hold the gate steady.

It's most important that the bottom of the gate does not scrape across the soil. Adjust as needed from the above table based on the location.



Installation Considerations. This gate is at the bottom of a hill so it can only swing open in the downhill direction and the land slopes gently from right to left. The gate can be opened without scraping the soil.

With the hinges on the right it can be opened with the left hand alone without putting down tools. The chain closer is on the left.

Photo 13.3.1-9 (b)

Step 8

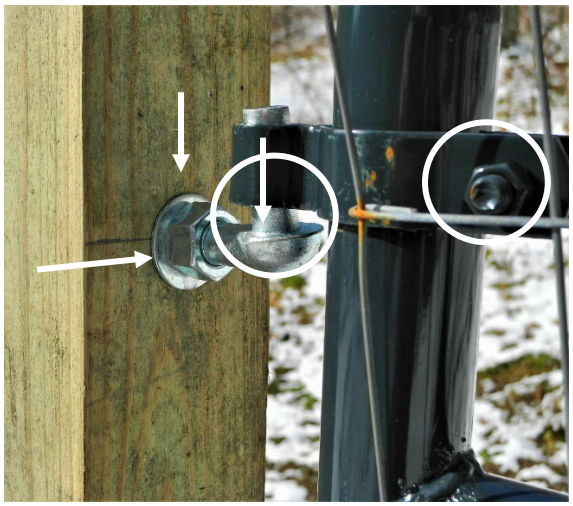
Install the Gate Bolts

Prep the Bolts – Remove the end bolt and both washers. Wind the inner bolt all the way toward the hinge post. Replace the inner washer.

Bottom Bolt First – When satisfied with ground clearance, mark at the bottom of the hinge. Using the speed square, draw a horizontal line and mark the center of the post. This will be the drilling mark. Drill the hole with the spade bit.

Installing Bolts – The fit will be tight on purpose. Expect to use the crescent wrench to finish.

Top Bolt Second – Place the gate on the bottom pin. Have an assistant hold it steady while making the same marks as for the bottom bolt. Remove the gate, drill the hole, and install the bolt.



Marks for Gate Bolt. Mark the center point of the post for the hole.

Adjustment – After installing the second bolt, the top hinge may not be perfectly aligned but there is flexibility. On the gate, the hinges are bolted. Loosen this and tap into place.

Photo 13.3.1-11 (b)

Step 9

Install the Gate

Outer Nut and Washer – Add these loose to each bolt. Do not tighten.

Place the Gate – This may require two people to situate larger gates on both hinge posts.

Adjust the Bolts – Check both sides of the gate for adequate clearance from the posts and vertical alignment. Make adjustments with the inner nut. Check for a neutral swing. When satisfied, tighten the outer nut to the post. Check again for neutral swing and alignment.

Ongoing Adjustments – Even when installed in concrete, gate posts shift. Expect to make adjustments until everything settles.

Installed Gate Bolt. Use the nuts to adjust for vertical alignment so the gate swings neutral.

See the Resource Section for gate bolts.

Photo 13.3.1-12 (b)

Step 10

Finish the Gate

The final step involves making the gate work for the creatures who will use and be controlled by it. Baby goats, for instance, can easily sneak under the low horizontals. Meanwhile, chickens easily fly over so they don't need the low passage.

An inexpensive solution is to attach goat fencing. Hang it with wire ties and finishing with wire. The fencing is mounted as close to the ground as possible. To control baby chicks, add 12 inches of one-inch mesh on top of this.

For an additional $20-30, some farm gates come with 2x2-inch mesh welded on but it only goes as low as the bottom rail. Do it better for less than a dollar with scrap fencing.

Finished Gate. Goat fencing mounted close to the ground.

Photo 13.3.1-13 (b)

Gates on a Slope

When in line with the slope (not lateral) there will be an angular gap at the bottom. Always mount the gate to swing open downhill. Then mount the bottom fencing barrier on the gate in line with the slope.

Bottom Line

- Before the first fence post goes in, the anchor points must be installed and secure. This starts with gates. Locations are determined by practical needs, options, topography, and fencing material. Consider gates carefully because changing a location can be very difficult.
- The type and size of gates is determined by what goes through those gates—equipment, animals, fowl, and humans. The last thing you want are too-small gates that restrict future developments on your homestead. The best locations for gates will be easy to use during daily routines.
- Before gate posts can be installed, the gate itself must be on hand. You'll be doing some measurements and math so take time to get it right. The ideal installation provides flexibility and allows for adjustments when soil settles and gate posts move. Don't get too precise.
- Factory-made gates are not always suitable for every situation—these will have to be homestead-built. Most likely they'll be small and light weight. Do not attempt to build large gates yourself unless desperate—factory gates are much easier to install and maintain.