Centaur HTP®

FENCING SYSTEMS

The Horse-Friendly Fence®

INSTALLATION MANUAL

2802 E. Avalon Avenue • Muscle Shoals, AL 35661-3748
www.centaurhtp.com
Telephone 1-800-348-7787
1-256-248-2403

The High Tensile Polymer Fence

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2802 East Avalon Avenue
Muscle Shoals, AL 35661-3748
1-800-348-7787

To The Customer:

Thank you for your interest in our Centaur High Tensile Polymer (HTP)® fencing system. I am sure after you examine this installation manual, you will agree that this is a very well engineered and thought-out fencing system. We have expended twenty years of time and several million dollars in the development of this product. As a matter of fact, we have been granted several patents. When properly installed following the instructions of this manual, your fence will give you many years of trouble-free performance.

This product was brought into existence as a result of my being a lifetime horseman and a manufacturer of polymers and plastics for approximately 50 years. Therefore, it was only natural after seeing a close friend's horse mutilated in a wire fence to be inspired to initiate the research which has been going on for the past twenty-four years. Safety was one of the foremost features that I wanted in this new fence, but other advantages were gained as well, including, low maintenance, traditional board look, toughness and long-term durability. After searching throughout the world for other types of products that might be in this category, we found absolutely none that could perform as well as this fence. It combines high tensile wire with advanced outdoor polymer technology. The material is rated at the highest level for outdoor performance of any polymer material on the market today. We tested several materials before we found a suitable state-of-the-art product. What other fence in the marketplace can compare to a fence rail that requires no painting, is the ultimate in safety, has the traditional board look, is super tough, and has the long-term durability that so many horse owners desire? They know if they build a conventional fence they will be saddled with a lifetime of painting, maintenance, injury and possible liability. Therefore, Centaur is known as the "horse friendly fence®."

Other aspects to consider are the engineering and testing that have been put into the installation methods we have developed at Centaur. These installation methods are unique to Centaur and have patents worldwide. The manual should be followed explicitly. In fact, to help assure a quality installation, we will not grant the warranty without photographs and completed affidavit as outlined in this manual.

Yes, we are proud of this unique product and want to make sure you will get the most from your investment.

Sincerely,

Edward S. Robbins, III
President

ESR/BW

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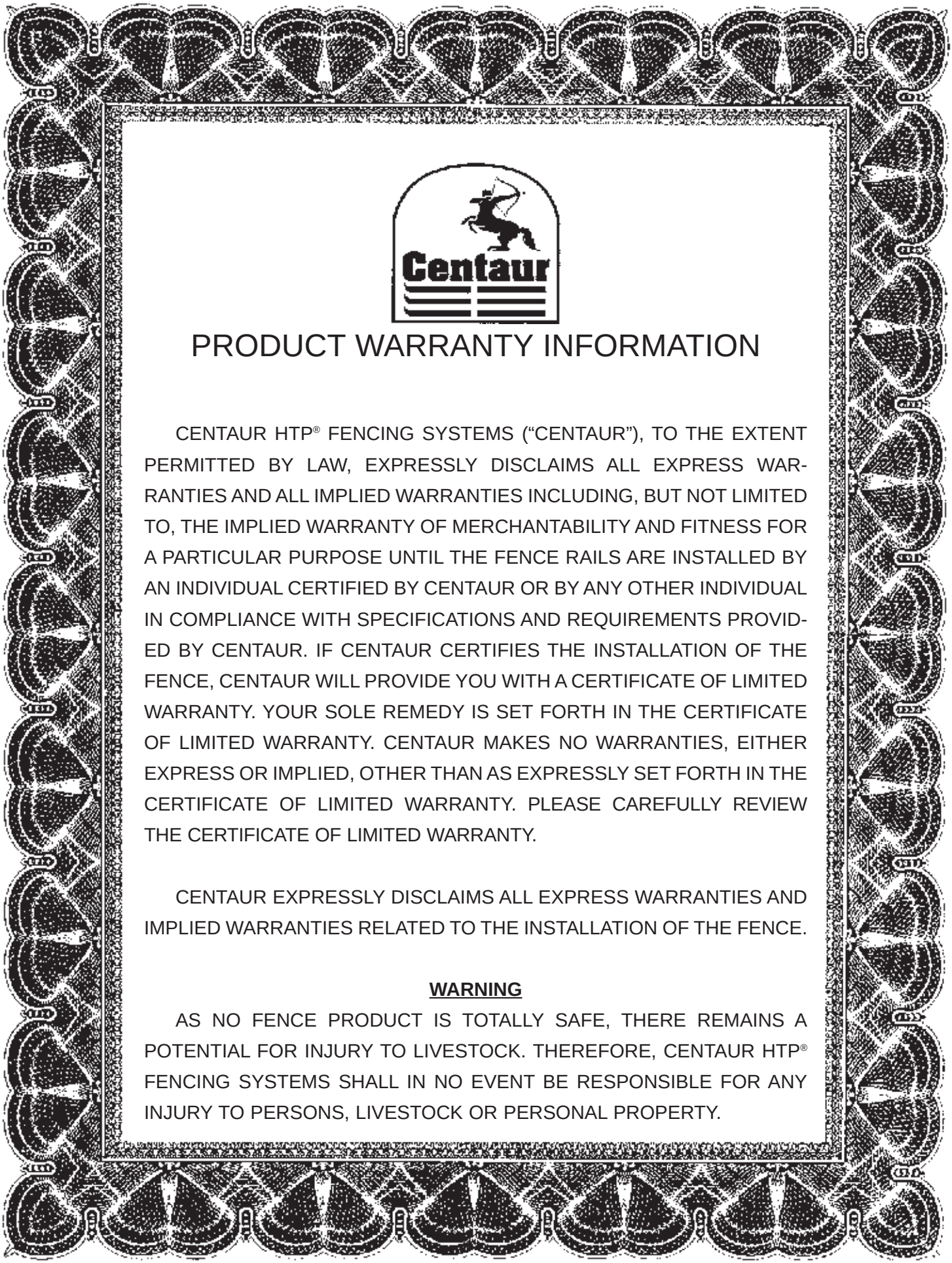


PRODUCT WARRANTY INFORMATION

CENTAUR HTP® FENCING SYSTEMS (“CENTAUR”), TO THE EXTENT PERMITTED BY LAW, EXPRESSLY DISCLAIMS ALL EXPRESS WARRANTIES AND ALL IMPLIED WARRANTIES INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE UNTIL THE FENCE RAILS ARE INSTALLED BY AN INDIVIDUAL CERTIFIED BY CENTAUR OR BY ANY OTHER INDIVIDUAL IN COMPLIANCE WITH SPECIFICATIONS AND REQUIREMENTS PROVIDED BY CENTAUR. IF CENTAUR CERTIFIES THE INSTALLATION OF THE FENCE, CENTAUR WILL PROVIDE YOU WITH A CERTIFICATE OF LIMITED WARRANTY. YOUR SOLE REMEDY IS SET FORTH IN THE CERTIFICATE OF LIMITED WARRANTY. CENTAUR MAKES NO WARRANTIES, EITHER EXPRESS OR IMPLIED, OTHER THAN AS EXPRESSLY SET FORTH IN THE CERTIFICATE OF LIMITED WARRANTY. PLEASE CAREFULLY REVIEW THE CERTIFICATE OF LIMITED WARRANTY.

CENTAUR EXPRESSLY DISCLAIMS ALL EXPRESS WARRANTIES AND IMPLIED WARRANTIES RELATED TO THE INSTALLATION OF THE FENCE.

WARNING

AS NO FENCE PRODUCT IS TOTALLY SAFE, THERE REMAINS A POTENTIAL FOR INJURY TO LIVESTOCK. THEREFORE, CENTAUR HTP® FENCING SYSTEMS SHALL IN NO EVENT BE RESPONSIBLE FOR ANY INJURY TO PERSONS, LIVESTOCK OR PERSONAL PROPERTY.

Warranty Requirements

In order to have a better understanding of installation methods; it is important that this manual is thoroughly read before beginning installation. **In fact, the methods presented in this manual must be followed or the warranty is void.** If you have any additional questions, please call your dealer/distributor.

In order to be eligible for your limited product warranty, within 90 days of purchase the following photos must be taken and sent back with the completed affidavit (found on page VI), production sticker, and quality questionnaire to: Centaur HTP® Fencing Systems (hereafter referred to as Centaur), 2802 E. Avalon Avenue, Muscle Shoals, AL 35661-3748:

1. A photo of a termination footing using one of the bracing methods described in this manual showing the depth and configuration before the concrete is poured (see photo 1 below).

2. A photo of a finished termination brace before the rail is attached (see photo 2 below).

3. A photo of a corner post footing showing the depth and configuration before the concrete is poured (see photo 3 below).

4. A photo of the corner completely finished with rail up and brackets nailed (see photo 4 below).

5. A photo of the tensioners installed.

6. A photo showing as much of the finished fence as possible.

In addition to these photos, the quality questionnaire must be completed as well as enclosing one of the stickers on the packaging showing the production date of the rail (one sticker for each date).

These photos, the quality questionnaire, the production sticker, and the affidavit will be examined by Centaur for proper installation of the fence. Once approved, a limited product warranty will be issued.

It is the opinion of Centaur that following these selected methods and techniques of installation will provide the most effective approach to equine containment, visual aes-

Quality Questionnaire

In order to ensure that you have a quality installation and for us to provide the best horse fencing solutions possible, please fill out the following survey. This survey must be filled out in order to receive a warranty. The installer is to complete the technical questions and the owner is to complete the quality questions.

Technical Questions (To be completed by installer)

1. To what depth were the footings for the terminations and corners dug?

2. What was the diameter of the auger if used?

3. What spacing was used between posts?

4. Were the line posts driven or augered?

5. What are the soil conditions (rocky, sandy, wet)?

6. Did the purchaser install the fence?

7. If not, was the fence installed by someone recommended by Centaur?

8. If so, who was the installer?

9. What are the **production dates** on the rail (found on the sticker on the rail packaging)?

Quality Questions (to be filled out by fence owner)

Please rate the following quality aspects using 4 for great, 3 for good, 2 for fair, 1 for poor:

1. Overall appearance of the rail itself. _____
2. Overall quality of the bracing at the terminations and corners. _____
3. Overall appearance of the fence. _____
4. Overall satisfaction with the fence. _____
5. Overall satisfaction with Centaur. _____
6. Overall satisfaction with the dealer / contractor. _____

AFFIDAVIT

I hereby certify that I have used the installation procedures and methods recommended in the Centaur Installation Manual and/or Centaur Installation video cassette. I also certify that the enclosed photos, as required by Centaur, depict the actual installation methods and procedures used installing the Centaur fence.

FENCE INSTALLER:

Signature _____

Name _____

Company _____

Title _____

Date _____

Date Installation Was Completed _____

WARRANTY TO BE ISSUED TO:

_____
NAME

_____
ADDRESS

REQUIRED TOOLS

The following tools are needed to successfully install a Centaur fence:

Hammer
Wire Cutter (small bolt cutter)
Safety Knife
Chainsaw
Shovels
Post Hole Diggers
Sharpie Markers
Long T-Square with lip (sheetrock square)
Safety Glasses
Twine or rope (min. 2+ times the length of the fence)
2 Stakes min. per corner
Pliers
Auger (min. 12 in. diameter) and/or post driver
Concrete
Level (48”)
Tape Measures- 25’ and 100’
Spinning Jenny
Tamping Bar

You should have received the following with your Centaur rails:

Termination Kits- including staples, brace plates or pins, tensioners, and crimp fittings
Brackets
Nails
Tensioner Tightening Tool

POST REQUIREMENTS

Centaur is engineered with the highest quality ultraviolet resistant polymer and galvanized or aluminum coated high tensile wire. Therefore, the use of quality posts is a must. Centaur recommends round pressure treated wood, polymer (line posts only), and 4" dia. schedule 40 steel posts. **NOTE:** Dipped treated, especially salt base posts, are not acceptable.

Listed below are the size recommended for use with the Centaur rails.

Post Type	Post DIA Post	Length	Depth of Embedment	Total Pounds**
Line	4" - 6"	7' to 8'	26" - 38"	600 - 1200
Corner	6" - 7"	8'	36"*	6000
Gate and/or Term.	7" min.	8'	36"*	8000
Horizontal Brace Post	4"	7-1/2' to 8'	N/A	N/A
Steel Plate Corners/Termination	6" - 7"	8'	On Diagram	8000

NOTE: If steel posts are selected to be used for installation, the following sizes are recommended: **Line Posts** - 1-7/8" minimum o.d. With a minimum wall of .090"; **Termination and Corner Posts** - 4" diameter schedule 40 steel posts. The termination posts are to have the same configuration and embedment as the wood posts. Welding of the horizontal or diagonal bracing is required. Centaur recommends the use of 2" long hex head self-drilling and self-tapping screws. All bracket holes need to be drilled out to a 15/64". All posts should be painted before attaching brackets.

** Failure is when the posts breaks or 1/2" movement of the base is observed. Total pounds may vary according to the post quality and/soil conditions.

GLOSSARY

barrel tensioner - the new style of tensioner that is mounted on either a line or termination post.

box tensioner - the older style of tensioner that is found between posts and has a box.

corner - any place in which the fence changes direction.

end post tensioner - a single barrel tensioner that is mounted on a termination post.

line post - any post that is not on a corner or termination.

line post tensioner - a double barrel tensioner that is mounted on the line posts and tightens two different stretches of rail.

paying out (the fence) - unrolling the fence before it is placed into the brackets

splicing - attaching two rails so that they become one.

stable soil - any soil that provides an excellent foundation for the fence. Examples include red clay and topsoil.

tensioners - mechanism used to tighten the fence

termination - any time the fence begins or ends.

top line - the very top of the top rail of fence. The top line should gently follow the roll of the land.

unstable soil - any soil that fails to provide a solid foundation for the fence. Examples include chronically wet soil, sand, and soil that has been moved.

GETTING STARTED

We have broken down the fence installation process into six different phases. The six different phases in order are: determining fence line layout, building corners and terminations, installing line posts, running top line, attaching brackets, and finally running the fence.

This manual will guide the installer through each phase so that an excellent fence is the finished product. The building corners and terminations section is especially vital. Quite simply put, following this manual is essential.

Before any work can be started, please call the appropriate companies before digging begins (power, gas, cable, etc.). Have them mark on the ground where any lines might be located so to prevent any major accidents.

PHASE I: DETERMINING THE FENCE LAYOUT

Phase 1: Determining the Fence Layout

Step 1: Determining fence layout with the owner

Step 2: Mow the projected fence line

Step 3: Measuring the layout and driving stakes

Step 4: Gate and/or termination layout

Step 5: Choosing the corners and terminations

Step 6: Calculating the amount of concrete needed

Important Tip: It is wise to have all of the holes that need concrete dug when the cement is ready to pour. This includes all holes at the terminations, corners, and for line post if that is the chosen method of installing line post.

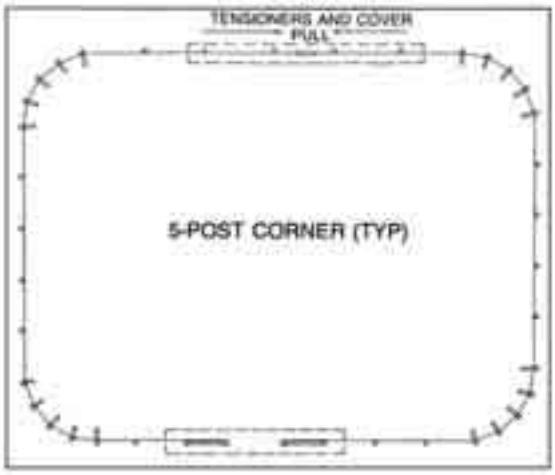
DETERMINING THE FENCE LAYOUT

Before anything else can happen, a layout must be agreed upon by the owner. The following must be determined before starting to mark the ground:

- Locations of any gates
- Property lines
- Desired locations of straight runs of fence
- Types of corners desired by the owner
- Locations of all places where the fence will be terminated
- Determine the Locations of the tensioners remembering that rolls of Centaur are 660 ft. long (See example layouts on next page).

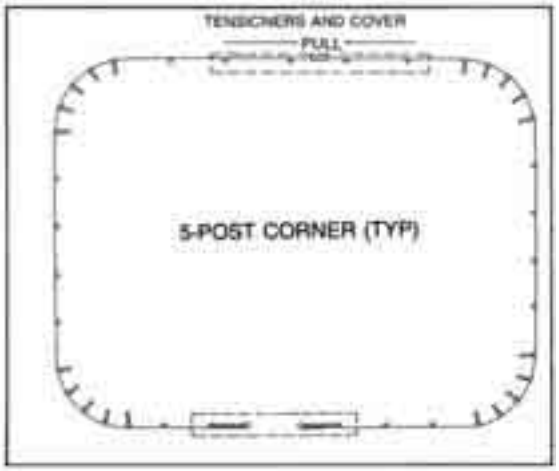
MOW THE PROJECTED FENCE LINE

Clear and mow fence lines to insure a minimum of obstacles. A typical paddock layout is shown below.



Paddock fence line layout with concrete footing on corner post - **Fence Installed on Inside**

<u>For a safer installation it is recommended to install rail on inside of posts **TOWARD LIVESTOCK.**</u>



Paddock fence line layout with concrete footing on corner post - **Fence Installed on Outside**

NOTE: It is useful to have a sketch of the area to be fenced.

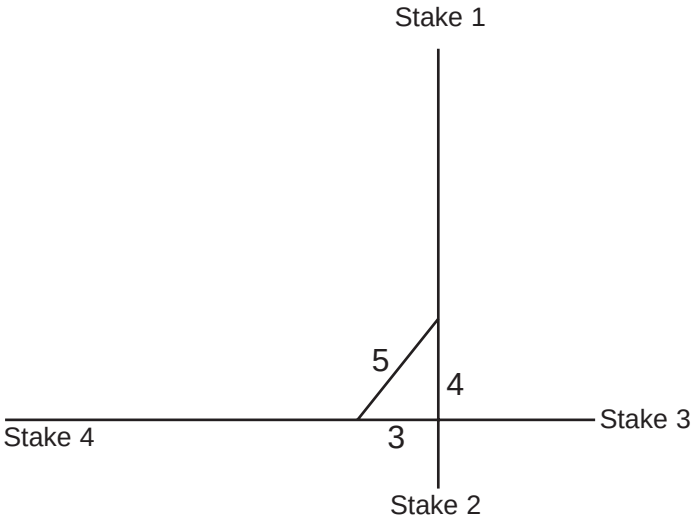
MEASURING THE LAYOUT AND DRIVING STAKES

Now it is time to start marking on the ground where exactly the fence is going to run. If the owner provided a drawing with exact dimensions, be sure to measure them out closely using a tape measure.

The best way to mark the lines is to run highly visible string along the layout. This string will be used to line up the line post, giving the fence a straight look. Some recommendations as to where to drive the stakes that are tied to the string are as follows:

1. Drive each stake a few feet past where the corner is going to be causing perpendicular strings to intersect (see diagram below).
2. For making a square turn, have the first string staked out as desired using stakes 1 and 2, then use the 3,4,5 rule for determining where to place the next stakes. As mentioned above, drive stake 3 about 2 feet past where the corner is actually going to be. Then guess about where 90 degrees is at and drive in stake 4. Now use a tape measure to measure up and make a mark at 4 feet from where the strings intersect on one of the strings and 3 feet on the other. Next measure the distance between the two marks represented by the diagonal line below. This measurement should be 5 feet if the strings are square. Keep adjusting the placement of stake 4 until the hypotenuse does in fact measure 5 feet.

Note: Keep these stakes in the ground with the string attached until the top line has been run.



CHOOSING THE CORNERS AND TERMINATIONS

The most important decisions to be made are the types of corners and terminations to install. There are four types of corners and three different types of terminations. **Remember for each gate there are two terminations.**

Terminations

The four types of terminations are horizontal, diagonal, horizontal diagonal, and steel plate horizontal diagonal. In order to determine which type of corner is ideal, one must consider soil conditions and climate. If the soil is stable and provides a good foundation, a termination that has less strength is suitable. However, if the soil is unstable due to the fact that it was once moved, sandy, or in a wet area, a stronger termination is needed.

A second factor that is relevant is how deep the frost line is. A heavier brace is needed in places that have a cold climate like Minnesota or Wisconsin. In these situations a horizontal brace is recommended.

Type	Strength (1 = strongest)	Climate	Soil
Horizontal	2	Best in Cold	Stable
Diagonal	4	Warm	Stable
Horizontal Diagonal	1	Warm	Any
Steel Plate HD	2	Any	Not Rocky

Table 1.1. Soil and Climate Recommendations for braces.

Important Tip: In situations where soil conditions are very poor, it may be necessary to add additional horizontal posts to the horizontal diagonal termination until the bracing reaches stable soil.

CORNERS

There are six different types of corners. The three corners that give a round corner are the five post corner, the steel plate five post corner, and the horizontal five post corner. Three other corners give a square look. They are the diagonal corner, the steel plate diagonal corner, and the horizontal diagonal corner.

Please see the table below for assistance in choosing a corner.

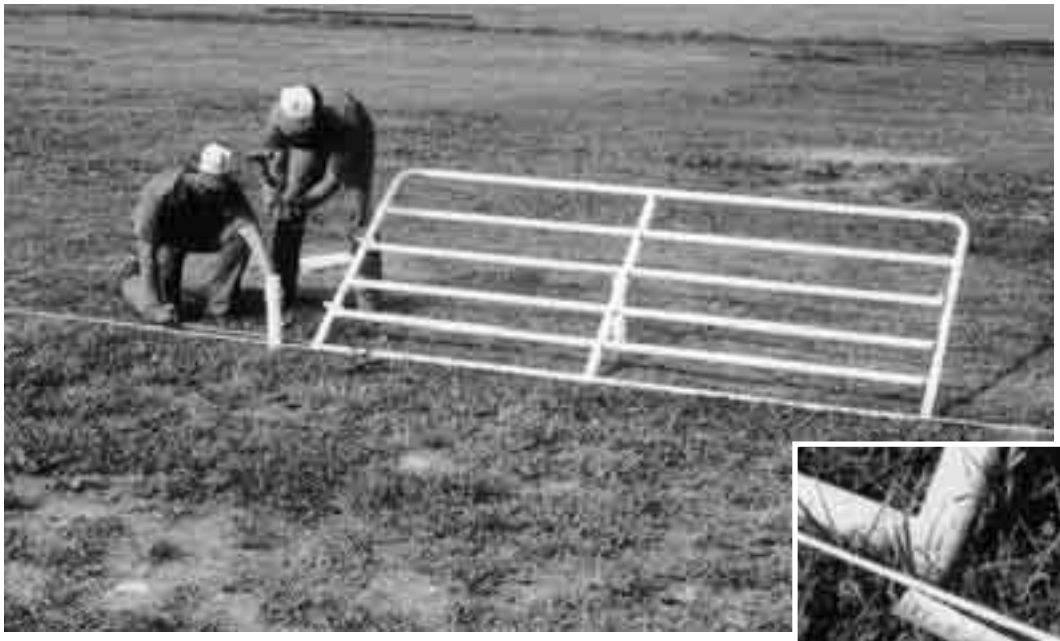
Type	Look	Soil Conditions	Strength (1 = strongest)
Five Post Corner	Rounded	Stable	5
Horizontal Five Post Corner	Rounded	Any	1
Steel Plate Five Post Corner	Rounded	Not Rocky	1
Diagonal Corner	Square	Stable	6
Horizontal Diagonal Corner	Square	Any	3
Steel Plate Diagonal Corner	Square	Not Rocky	3

Table 1.2. Recommendations for Choosing Corners.

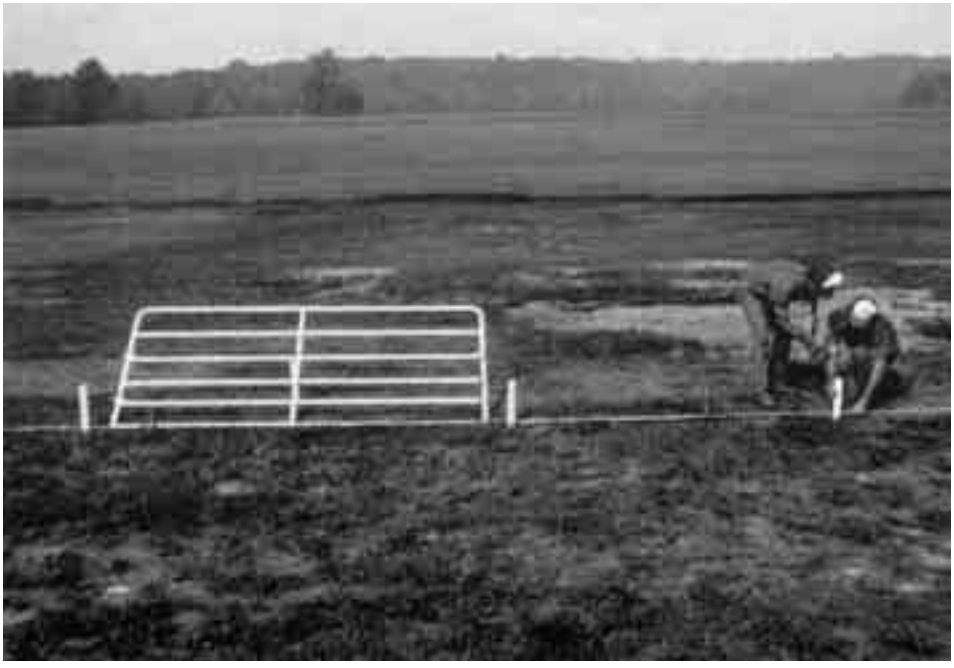
Note: The steel plate methods were developed as an alternative to using concrete on the corners and terminations. This method is not recommended in rocky conditions. One idea to consider is to drill a 4 inch diameter pilot hole at each place where a post with a steel plate attached is going to be driven so as to see if a rock would prevent the plate from being driven.

GATE AND/OR TERMINATION LAYOUT

Each gate requires two terminations, one on either side. Initially, determine where the gate is to be located. Either use the actual gate or place two stakes in the ground spaced the exact width of the gate, and follow the steps outlined below:



Measure 6” from the gate and drive a stake. Do this on both sides of the gate.



If you are using the termination with a horizontal brace, measure 7-1/2’ to 8’ from the gate stake and drive another stake. If you have selected the termination with a diagonal brace, measure 6’ and drive the stake. If you are using the combination horizontal/diagonal termination measure 7’ to 8’ and drive the stake and measure an additional 6’ and drive another stake. (All types of terminations are described on the following pages.) This is to be done on both sides of the gate. These are the spacings required for braces on terminations.

CONCRETE CALCULATIONS

The table below will help in calculating the amount of concrete needed. The calculations below are for the **average** minimum depth of the holes required in the manual. Therefore, if certain holes are going to be deeper, adjustments need to be made so as to not run out of concrete.

Tip: Concrete trucks are often unavailable on Saturdays. Check with the local concrete company ahead of time if installation is planned on a weekend.

Brace/Termination	Cubic Inches of Concrete	Cubic Yards of Concrete
Diagonal Termination	4839	.104 (9.6 terms/yard)
Horizontal Diagonal Term.	7384	.158 (6.3 terms/yard)
Horizontal Termination	14912	.320 (3.1 terms/yard)
5 Post Corner	27350	.587 (1.7 terms/yard)
5 Post Horizontal Corner	27350	.587 (1.7 corners/yard)
Diagonal Corner	6567	.141 (7.1 corners/yard)
Horizontal Diagonal Corner	12223	.262 (3.8 corners/yard)
Line Posts	2543	.055 (18 posts/yard)

Example of a Concrete Calculation:
If an installation has 2 Diagonal Terminations, a 5 Post Corner, and a Diagonal Corner, with the help of the table above the amount of concrete needed is as follows:

Concrete Needed = 2*.104 + .587 + .141 = .936 cubic yards of concrete.

Tip: Concrete is often sold by the yard. Always remember to round the calculated number of cubic yards of concrete needed up to leave a little left over. It is better to order a little extra than not enough.

PHASE 2 OPTION A: BUILDING CORNERS AND TERMINATIONS WITH CONCRETE

By now it should have been determined which types of terminations and corners are going to be used. For each type of corner and termination, the following steps are usually taken:

1. Mark the precise hole locations on the ground.
2. Auger and clean out the holes as specified in the manual.
3. Nail any supports that need to be attached before concrete is poured.
4. Place the posts in their proper positions in the hole. Be sure to use a level and the string on the ground to ensure that the post is level and in line.
5. Pour the concrete into the hole. Stop pouring when the concrete is within six inches of ground level. Be sure to keep checking that the post is level and has a lean about 1 inch away from the direction of pull for terminations posts.
6. Finish assembling the brace.

Important Tip: It is recommended that each termination and corner be prepared for concrete so that when the concrete arrives, it can be poured into each hole without wasting time.

More specific information on how to build each termination/corner will be given in the following pages:

Terminations

Option 1: Diagonal Termination

Option 2: Horizontal Diagonal Termination

Option 3: Horizontal Termination

Corners

Option 1: 5 Post Corner

Option 2: 5 Post Horizontal Corner

Option 3: Diagonal Corner

Option 4: Horizontal Diagonal Corner

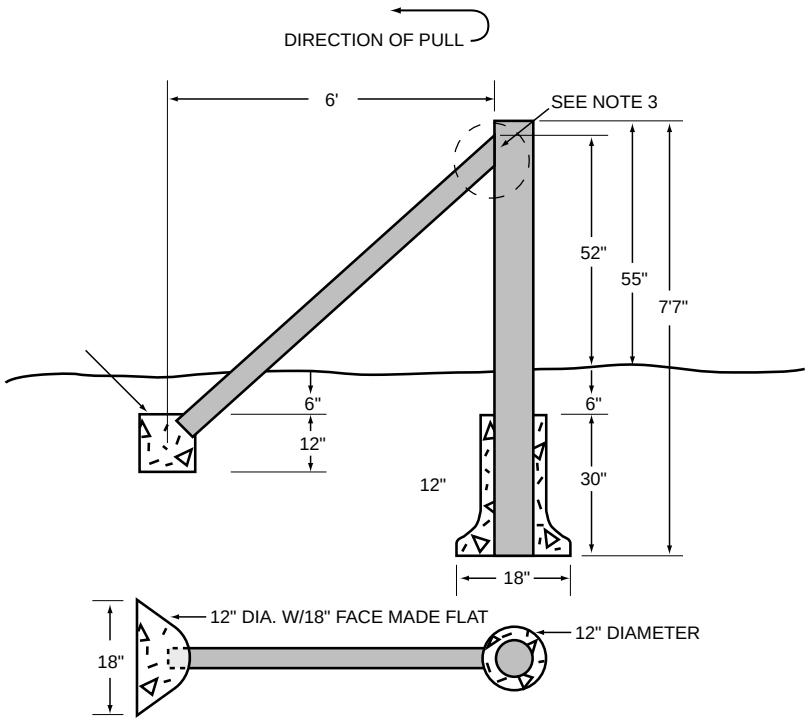
DIAGONAL TERMINATION

The gate post location or the last post of a run of fence is to be marked with a stake. Six feet from this stake, drive another stake as shown above.

The footing hole away from the gate post is to be augered to a depth of 18” and faced off.

The gate post hole is to be augered to a depth of 36” and belled.
See Drawing 2.1 below for details.

DRAWING 2.1



NOTES:

1) The gate post is 7” min. dia.
2) The depth of concrete may vary according to frost lines in your area. Consult local codes for details. If the frost line is below 18”, the concrete thickness of 12” must be increased to the frost line.
3) Lean post 1/2” to 1” away from direction of pull.
4) Bell out bottom of hole as shown to 18” dia.
5) 24” bell dia. is recommended in unstable soil.
6) It is recommended to auger a 16” diameter hole, 3 feet deep with a bell in the northern states and 4 feet deep in Canada.
7) If soil is moist or loose, extend face from 18” to 24”.

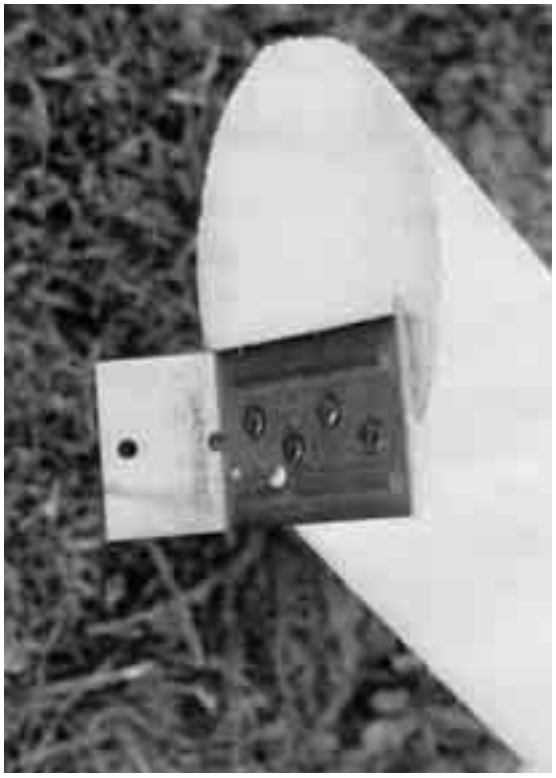
DIAGONAL BRACING

Diagonally braced termination assemblies require a diagonal brace.

The following description and photos represent the procedure for installing diagonal bracing for gate termination or one side of a 90˚ corner.

In order for the diagonal brace post to fit down into the concrete footing, a small section of dirt is to be removed as shown above. Also notice the 8' long, 7" diameter gate post has been placed in the 36" deep hole and should be 55" from ground level after it is cut to length.

In order to determine how long the diagonal brace post is to be, measure from the top of the gate post to the edge of the footing hole. Add approximately 4" to this measurement. Mark the diagonal post and cut it off at a 45˚ angle as shown below. Check your length by placing the diagonal brace in the footing and against the upright gate post and verify that it will be down into the footing approx. 1" after the concrete is poured, as shown in Drawing 2.1 • page 2-2.



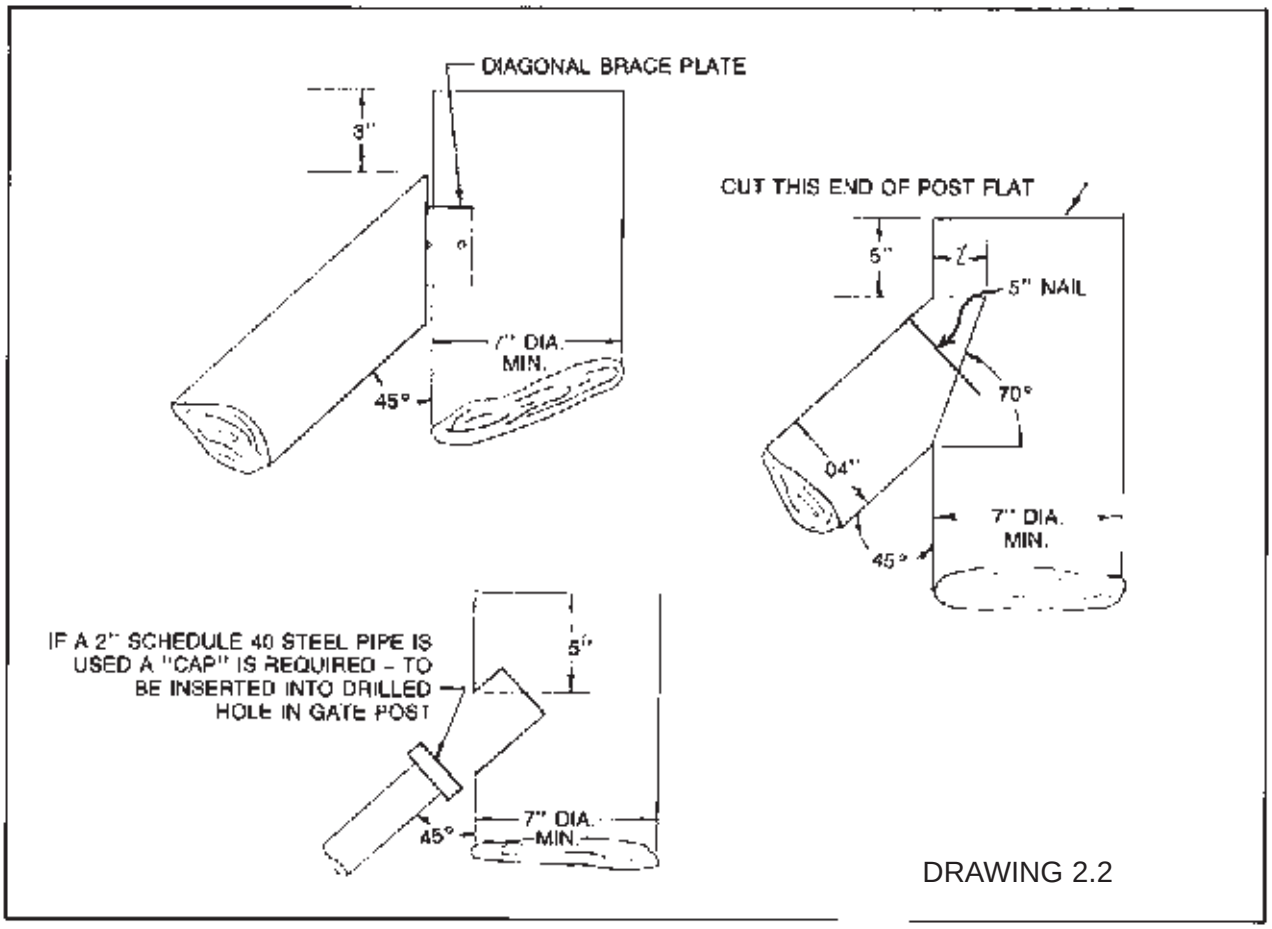
After you have verified the length, attach the diagonal brace plate, as shown, using 3-1/2” long nails.

Measure down 3” from the top of the gate post and mark it as shown in photo on left.

Keeping the top of the diagonal brace post on the mark, nail bracket into place using four 3 ½ " or 5" long nails as shown.

The photo to the left is the way a diagonal brace should appear prior to the concrete being poured to within 6" of ground level.

The sketch #9 below represents three recommended ways to attach the diagonal brace post to the gate post.



DRAWING 2.2

The photo below is a diagonally braced termination after concrete has been poured and prior to backfilling of dirt.

NOTE: **While concrete is being poured, make sure you lean the post away from the direction of pull approx. ½" to 1".**

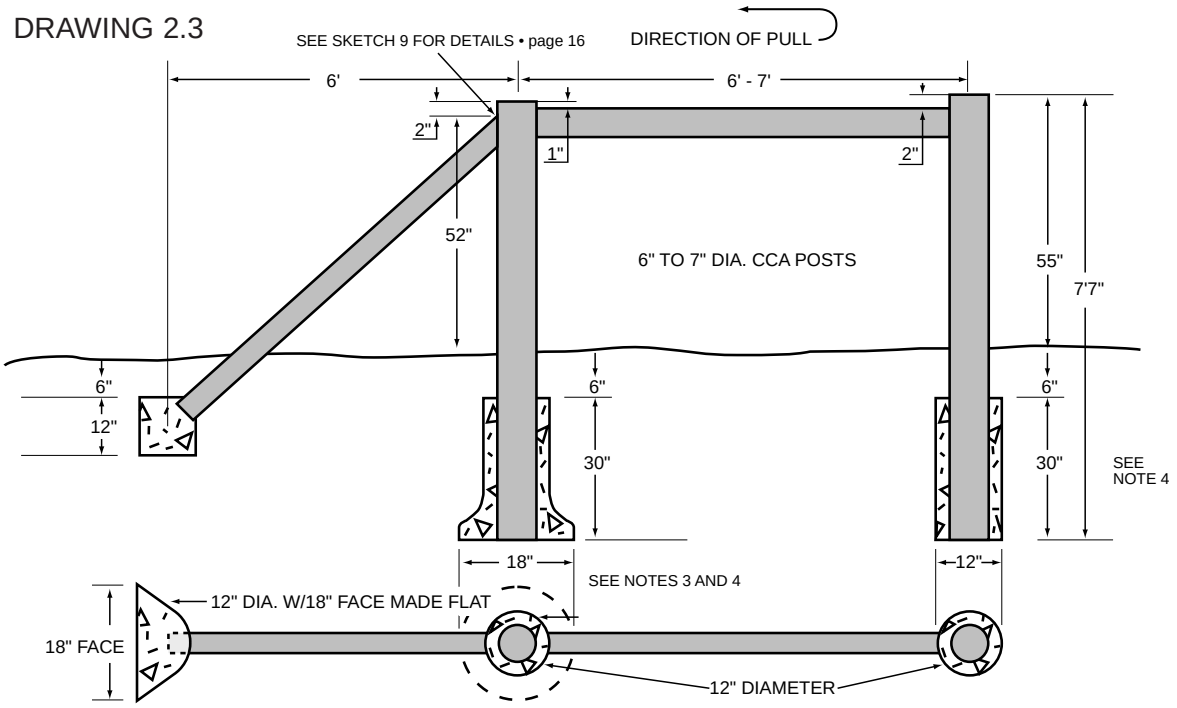
If is recommended to spray paint the brace plate as shown below.

HORIZONTAL DIAGONAL TERMINATION

Follow the same steps used in building a diagonal termination, except add an extra post with a connecting post. See the horizontal termination section to see how to attach the horizontal post.

Follow Drawing 2.3 for exact dimensions. pg. 2-8

DRAWING 2.3



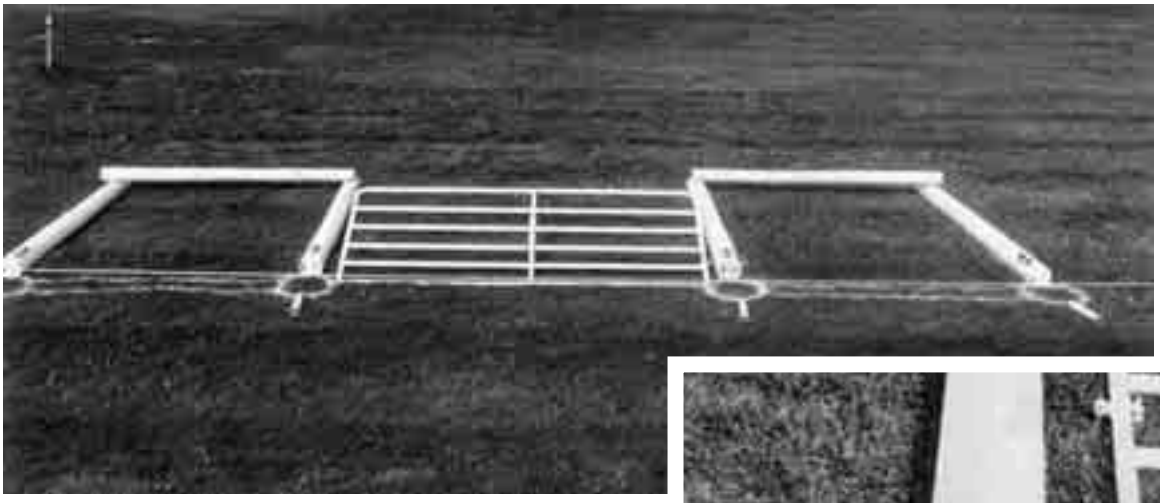
NOTES:

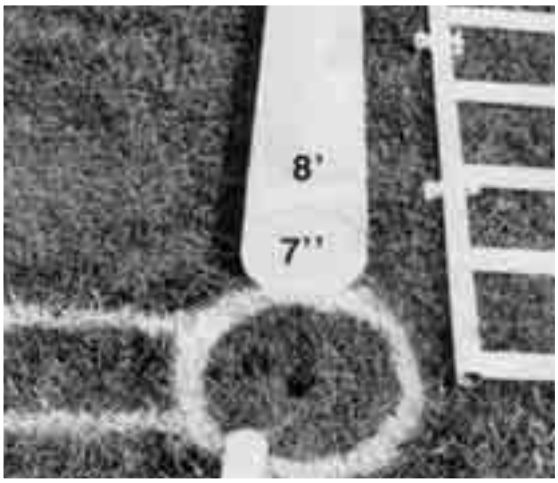
1. The depth of concrete may vary to frost lines in your ares. Consult local codes for details.
2. Lean post " away from direction of pull.
3. 24" bell diameter is recommended in unstable soil.
4. It is recommended to auger a 16" diameter hole, 3 feet deep with a bell in the northern states and a 4 feet, 16" diameter in Canada.

This is a completed termination.

HORIZONTAL TERMINATION

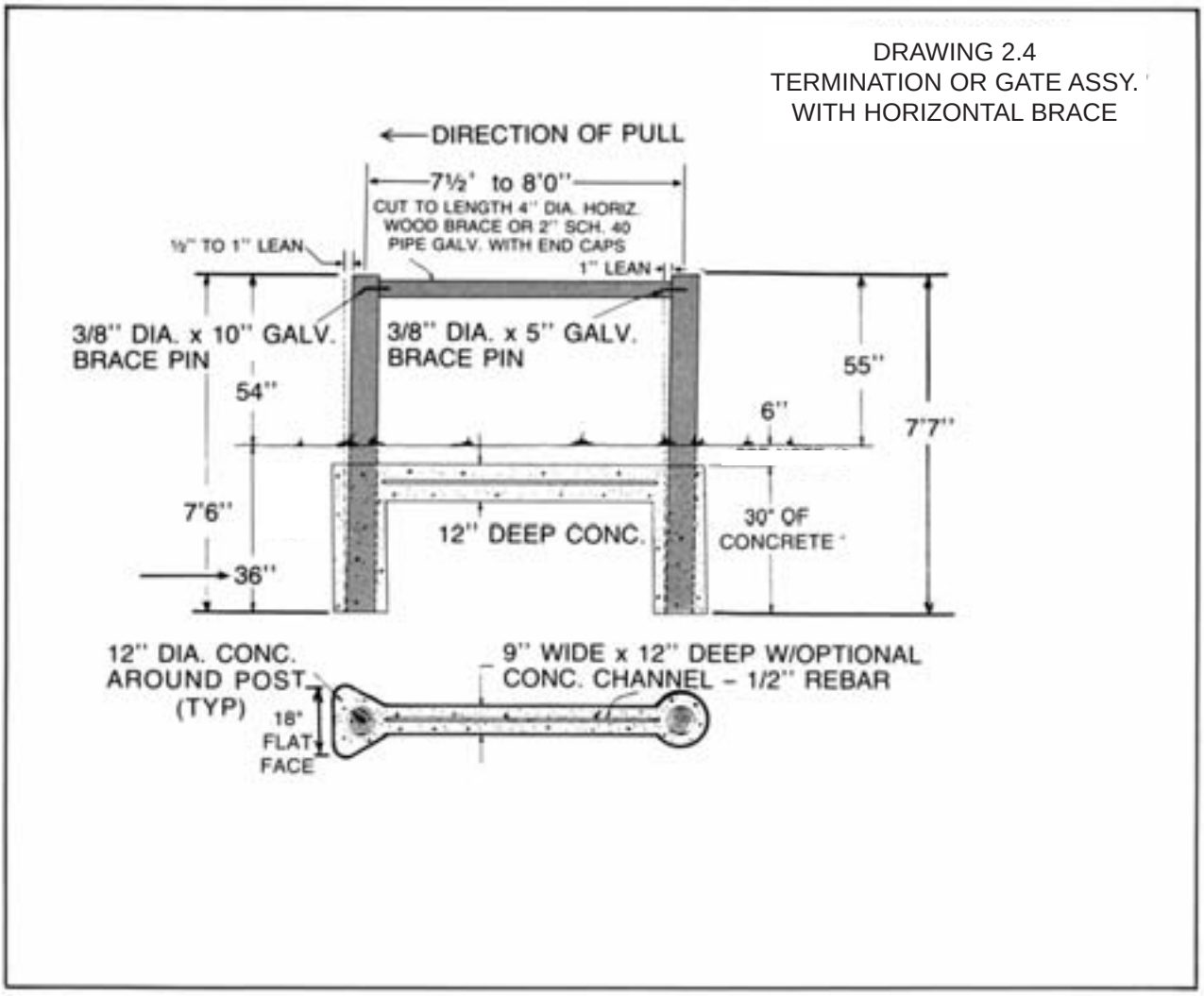
It is helpful to lay out the perimeter lines for the underground bracing with spray paint prior to the auger and concrete work.





For details on the dimensions of the termination with horizontal bracing, refer to Drawing 2.4 on the next page.

DRAWING 2.4
TERMINATION OR GATE ASSY.
WITH HORIZONTAL BRACE



It is helpful to auger a series of 9” diameter holes, 18” deep, between posts. Then the trench is easily cleaned with a post hole digger or a shovel. The trench is to be 9” wide. If you do not have a 9” auger, your 12” will work, only a little more concrete will be required.

Concrete is poured to within 6” of ground level for a gate and or termination.

NOTE: While pouring concrete lean post away from direction of pull approximately 1” as shown in Drawing 2.4 on the previous page.

See the next section for finishing your horizontal brace.

NOTE: It is recommended to use this type of termination in Minnesota and Wisconsin.