

# Fence Brace Assemblies<sup>1</sup>

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Sound fences are an essential part of livestock operations. Most fence failures are caused by improper construction of end and corner post assemblies. The end or corner assembly posts must be relied upon to hold the fence tight. When end and corner assemblies are properly constructed, a few line posts can fail without affecting the fence as a whole, and breaks in fencing wire can be easily repaired. The failure of a bracing assembly may require that the entire fence be rebuilt.

## Posts

Wooden post sizes are usually given by the post's top diameter in inches followed by its length in feet. A post with a six inch top diameter and eight feet long is referred to as a 6" x 8' post. Line posts are usually 4 inches in diameter. Corner posts should be 5 inches in diameter or greater.

Steel posts are sometimes used for fencing. They generally cost more than wooden posts and may be bent out of line by livestock pressure. Their main advantages are that they weigh less, can be easily driven and ground fences against lightning when the soil is moist.

Posts are sometimes fabricated from concrete, however, these posts are generally weaker than wood or steel posts. Their advantages are that they are fire and decay resistant.

## Preservatives

Wooden posts should be pressure treated with preservatives when used in Florida. Three types of treated posts are

available in Florida. Creosote treated posts have excellent resistance to insect damage and decay. They absorb little moisture and have good resistance to grounding when used for electric fences. Paint does not adhere to creosote. Creosote may damage the hides of livestock and irritate the skin farm workers. Creosote posts should meet the requirements of AWPA (American Wood Preservers Association) Standard C-16.

Another wood preservative suitable for protecting fence posts is CCA (chromated copper arsenate). Posts treated with this material are dry and can be painted. CCA pressure treated wood posts should meet AWPA Standard P-5.

Penta-chlorophenol treated posts are presently available in Florida, but because of concerns about the presence of carcinogenic compounds called dioxins in this material, penta treated posts may not be available in the future. Penta treated posts can be painted. They should not be used around dairies or operations involving foodstuffs. Penta treated wood posts should meet the requirements of AWPA Standard P-8. All posts should be purchased only from dealers that can certify the treatment that they offer.

## Embedment Depth

Corner and end posts should be set at least 42 inches deep. A post set 42 inches deep has double the holding power of one set 30 inches deep. Brace assemblies used with high tensile wire should be set at least 48 inches deep because of

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the greater forces involved. Line posts should be embedded a minimum of 24 inches.

## Brace Assemblies

Several arrangements of posts can be used to fabricate end brace assemblies. Figure 1 illustrates some types commonly seen in Florida. Horizontally braced assemblies with a diagonal brace wire are the most effective, simple and economical. Set posts six to eight feet apart and perfectly in line with the fence. Connect wood braces with  $\frac{3}{8}$  inch diameter steel dowel pins four inches long. Use four strands of No. 9 smooth galvanized wire to make the diagonal brace wires. Fasten the wires 4 inches below the top of the post and 4 inches above grade. Tighten wire braces with a  $\frac{3}{4}$  inch by 1 inch wood slat or with a  $\frac{3}{8}$  inch steel rod until the entire assembly is rigid. The slat or rod should be left in position and wired down so that it does not loosen.

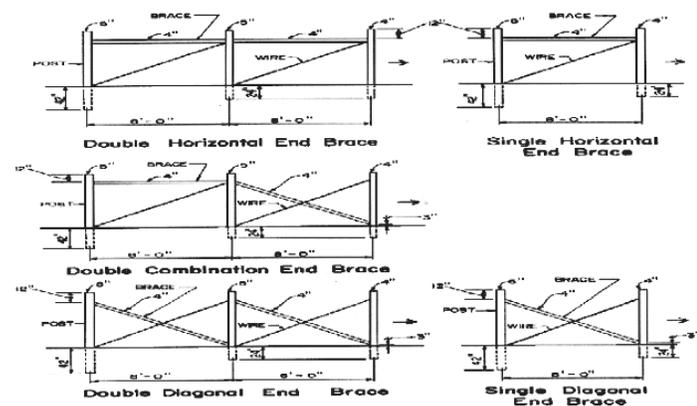


Figure 1.

Several different brace assembly designs are in use. The recommended design is the double horizontal brace assembly. Double span assemblies carry greater loads than single span assemblies of the same length. Use double assemblies whenever the fence will be greater than 200 feet long. Corner posts require a brace assembly for each fence line leading to them.

Line braces should be placed a minimum of 220 yards apart in straight runs and at the top and bottom of large changes in elevation. Figure 2 shows some recommended designs for line brace assemblies. In general, the longer the brace assembly, the greater its strength. Buckling problems may develop if extremely long horizontal braces are used. Eight feet is the maximum recommended length of horizontal braces.

Diagonal brace assemblies can be constructed which have greater strength than horizontal systems. However, when these assemblies fail, they fail suddenly by lifting vertically

out of the ground. A horizontally braced assembly fails slowly by overturning to the side. The horizontal assembly is easier to construct because the braces do not have to be cut on an angle. The bottom edge of the diagonal brace will be in contact with the soil resulting in a greater potential for decay. Also, the area around the angle formed by the diagonal brace and the vertical brace at the lower end will tend to collect moisture and increase the chances for decay. So for most applications, horizontal assemblies are best. If diagonally braced assemblies are used, deeper embedment depths are recommended.

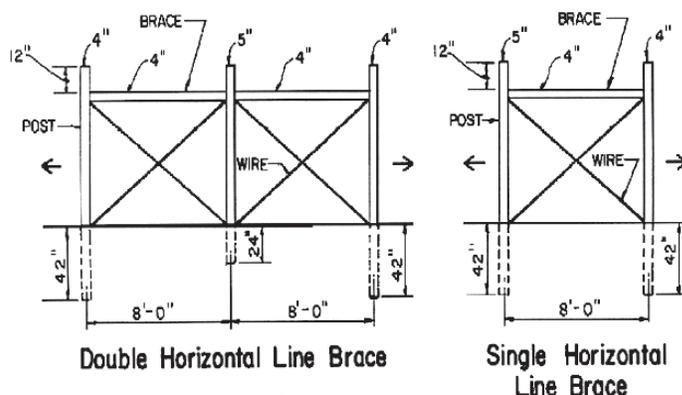


Figure 2.

## Maintenance

Brace assemblies that are cared for will give years of service. Plan a regular inspection routine and repair or replace assemblies when they show signs of weakness. Refasten loose wires to posts and splice broken wires.

## Conclusion

Livestock producers will experience fewer problems with fences if they provide good corner and end brace assemblies. The double horizontal brace assembly will prove to be the most satisfactory for most applications. Using the proper materials, utilizing the right construction techniques and establishing a regular maintenance program will provide effective braces for fences.