

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE SPECIFICATION**

FENCE

(feet)

CODE 382

STEEL DIAGONAL BRACES

SCOPE

This document establishes the technical details, workmanship, quality and extent of materials required to install the practice in accordance with the Conservation Practice Standard. The information shall be considered when preparing site-specific specifications for steel diagonal braces for use with standard post and wire fences. Specifications for other fence components are contained in separate documents.

The NRCS Washington Jobsheet for Standard Post and Wire Fence or Power Fence shall be used to document the site-specific specifications for installing, operating, and maintaining the practice on a specific field or treatment unit. The work shall consist of furnishing materials and installing materials for the specified design at the location(s) shown on the plan map, drawings, or as staked in the field.

Fencing includes brace assemblies, line assemblies, gates, cattle guards, and other components required for meeting site conditions and achieving the objectives of the practice application. Other documents (worksheets, maps, drawings, and narrative statements in the conservation plan) may be used in addition to the Jobsheet to document site specifications or to plan or design the practice.

Diagonal braces are structurally equal to the horizontal fence brace. The diagonal brace requires one less post, is 8% more resistant to overturn, 25% less expensive, and requires only about half the labor to install.

The fence will be installed in accordance with proper safety procedures.

The completed job shall be workmanlike and present a good appearance.

If brush or rock clearing, grading or other land work is to be done in conjunction with the fence installation, appropriate grading and erosion control measures shall be undertaken or installed. In some instances, it is advisable to also install a Firebreak (Code 394) and an Access Road (Code 560). Specifications for all measures to be installed in conjunction with the fence should be attached to the Jobsheet.

Steel Diagonal-Braces are suitable for all applications of post and wire fences, electric fences, and net wire fences.

MATERIAL SPECIFICATIONS

All materials used in the construction of fences shall have a minimum life expectancy of ten (10) years.

Fences will be constructed that equal or exceed the strength and durability of one built in accordance with the materials specifications in the following tables.

All posts shall be placed to the required depth and shall be firmly embedded. Posts shall be set to the minimum depths listed in Table 1 - Material Specifications for Corner Braces, End Braces, In-Line Braces and Gate Posts – Steel Diagonal Braces

Posts must be of sufficient length to meet fence height, setting depth requirements, plus 6 inches.

Table 1 - Material Specifications for Corner Braces, End Braces, In-Line Braces and Gate Posts – Steel Diagonal Braces

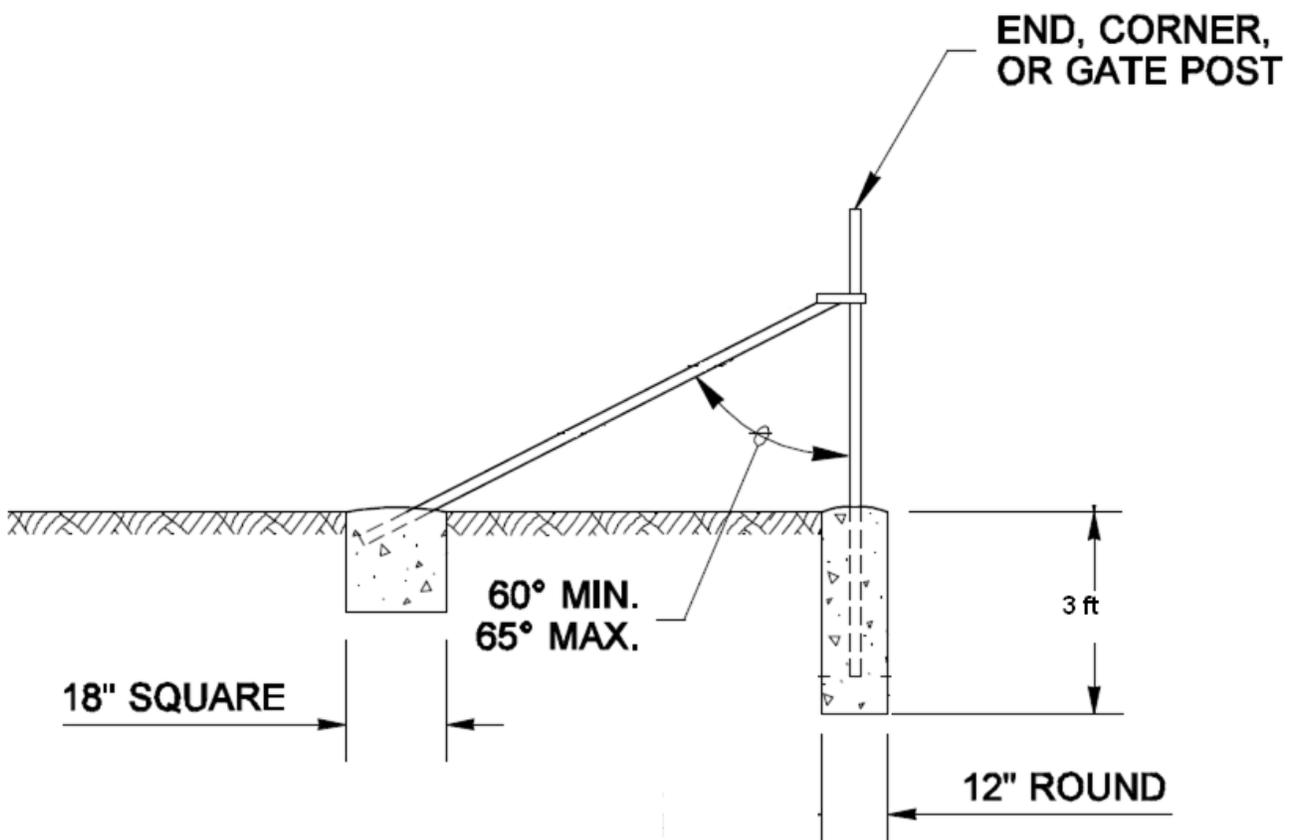
Parameter	Specifications																											
Acceptable Material - Post	<ul style="list-style-type: none"> ◆ 2 3/8 inches outside diameter (OD), 3.65 lb./foot or equivalent <ul style="list-style-type: none"> ➤ Schedule 40 pipe will meet these requirements ◆ Steel, angle iron 2.5-inch x 2.5 inch x 0.25 inch 																											
Treatment	<ul style="list-style-type: none"> ◆ Galvanized with 2 oz./square foot zinc coating <ul style="list-style-type: none"> ➤ Schedule 40 pipe will meet these requirements 																											
Corner Braces, End Braces and In-Line Braces (pull post or strainers)	<ul style="list-style-type: none"> ◆ Minimum length: 7 feet, including minimum 3 feet set in ground in 12 inch diameter or 12 inch square concrete. 																											
Brace Member	<ul style="list-style-type: none"> ◆ Steel, round pipe or tubular steel 1-5/8 in. OD, 2.25 lb./foot or equivalent ◆ Steel, angle iron, diagonal (when used with and all metal brace system) 2 inch x 2 inch x 0.25-inch ◆ Minimum length:sized based on height of attachment plus 1 foot for concrete embedment per following table <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="3" style="text-align: center;">BRACE MEMBER LENGTH (FEET)</th> </tr> <tr> <th style="text-align: center;">Attachment Height</th> <th colspan="2" style="text-align: center;">degrees</th> </tr> <tr> <th style="text-align: center;">feet</th> <th style="text-align: center;">60</th> <th style="text-align: center;">65</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2.5</td> <td style="text-align: center;">5</td> <td style="text-align: center;">5.9</td> </tr> <tr style="background-color: #e0e0e0;"> <td style="text-align: center;">3</td> <td style="text-align: center;">6</td> <td style="text-align: center;">7.1</td> </tr> <tr> <td style="text-align: center;">3.5</td> <td style="text-align: center;">7</td> <td style="text-align: center;">8.3</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">8</td> <td style="text-align: center;">9.5</td> </tr> <tr> <td style="text-align: center;">4.5</td> <td style="text-align: center;">9</td> <td style="text-align: center;">10.6</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">10</td> <td style="text-align: center;">11.8</td> </tr> </tbody> </table> <p style="margin-left: 40px;">ADD ONE (1) FOOT FOR EMBEDMENT IN CONCRETE</p>	BRACE MEMBER LENGTH (FEET)			Attachment Height	degrees		feet	60	65	2.5	5	5.9	3	6	7.1	3.5	7	8.3	4	8	9.5	4.5	9	10.6	5	10	11.8
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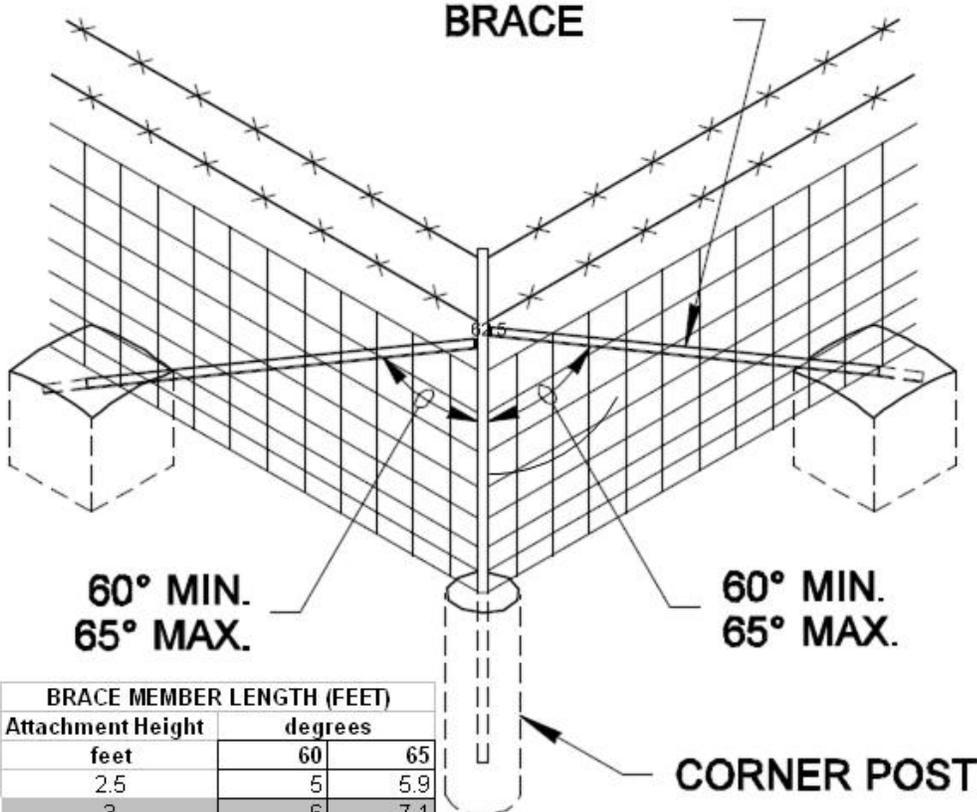
INSTALLATION SPECIFICATIONS

All posts shall be placed to the required depth and shall be firmly embedded. Posts shall be set to the minimum depths listed in Table 1 - Material Specifications for Corner Braces, End Braces, In-Line Braces and Gate Posts – Steel Diagonal Braces.

Posts shall be set in holes and backfilled with poured concrete. The holes shall be at least twelve(12) inches in diameter. Concrete backfill around posts shall be rodded into place in layers not thicker than 12 inches and shall completely fill the posthole to ground surface. Backfill of concrete shall be crowned up around posts at the ground surface.

Concrete shall be class 3000 in accordance with Washington NRCS Construction Specification CS-42, Concrete for Minor Structures. Concrete shall be allowed to set for ten days before tension is applied to the brace assemblies through tightening of wire.





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feet	60	65
2.5	5	5.9
3	6	7.1
3.5	7	8.3
4	8	9.5
4.5	9	10.6
5	10	11.8

ADD ONE (1) FOOT FOR EMBEDMENT IN CONCRETE

INSTALLATION SPECIFICATIONS DIAGONAL STEEL BRACE

Brace posts shall not be set in muck, peat, or soils on which water stands.

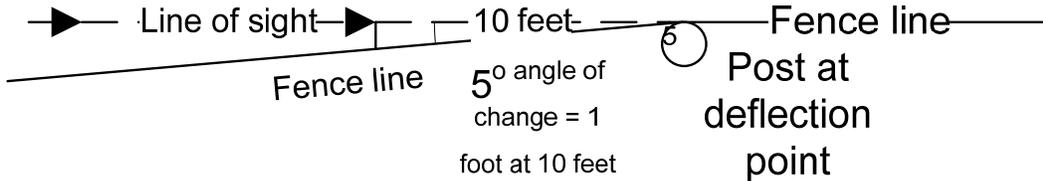
BRACING AND ALIGNMENT

It is recommended not to exceed 1/2-mile between gates (braces) for ease of management.

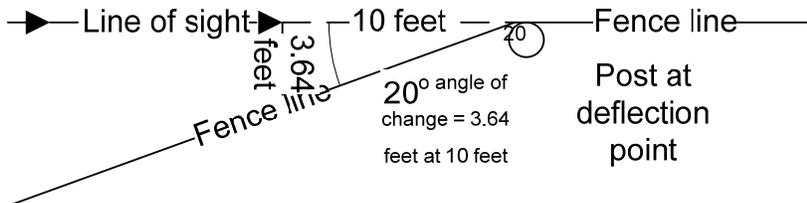
Braces are required at all end corners, gates and definite angles of change (horizontal) greater than 5 degrees if bearing on a metal line posts, greater than 20 degrees if bearing on a sound wood post a minimum of 4 inches in diameter and embedded a minimum of 3 feet.

- Between 20 and 60 degrees angle of change use 2 separate braces. Fill the distance between the posts with wire
- Greater than 60 degrees angle of change a single brace may be used

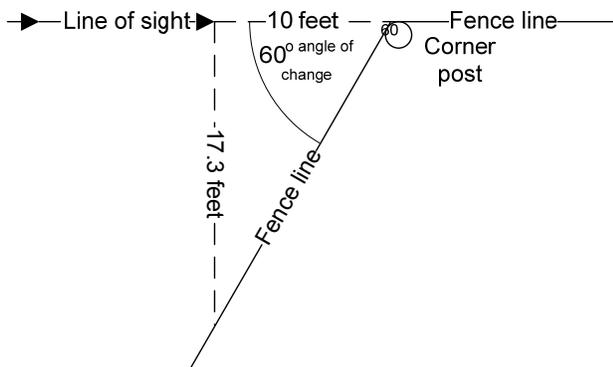
How to estimate a 5° angle



How to estimate a 20° angle



How to estimate a 60° angle



BASIS FOR ACCEPTANCE

After the fence has been installed, a site inspection will be made to determine if the materials and the design and installation adhered to the site-specific specifications documented in the practice Jobsheet.