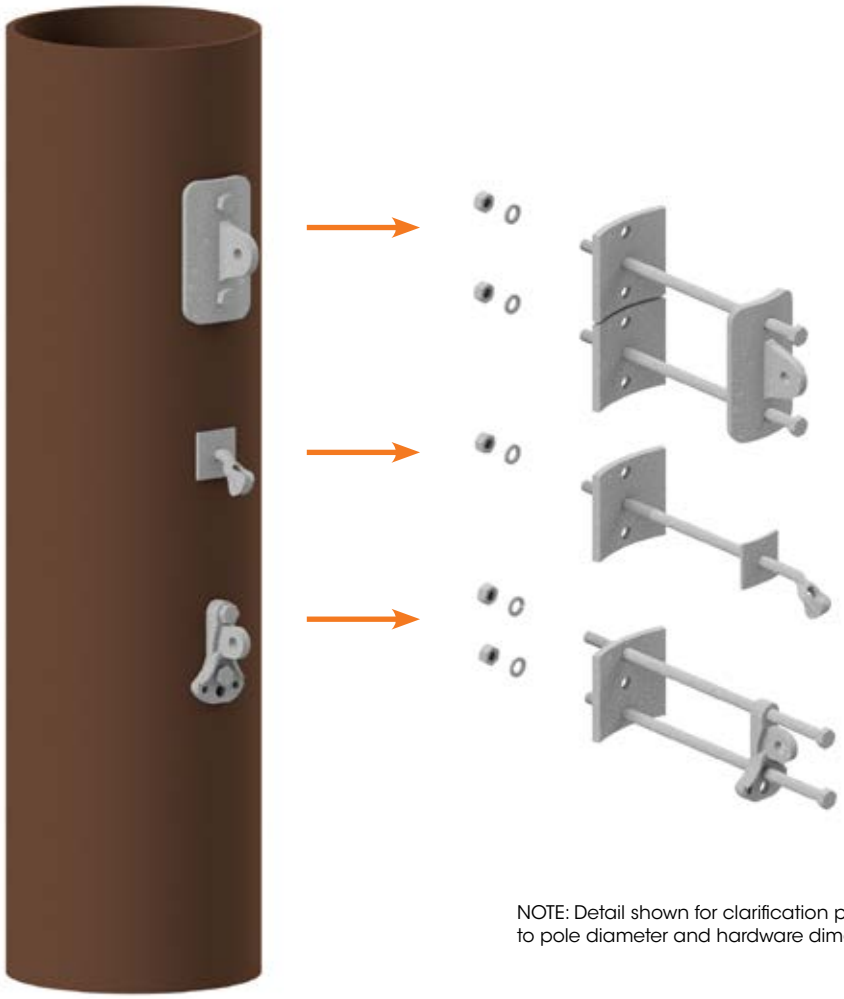
StormStrong® 3-Hole Curved Washer & Guy Hardware



Round Pole - TU460 16" dia.

6" Spacing Guy Attachment BOM:
(1) FAB887 - Dead End Tee
(2) 20" x 3/4" Bolt A325 or 5 SAE Grade
(2) FAB186 - 3/4" Nuts A325 or 5 SAE Grade
(2) FAB187 - 3/4" Lock/Spring Washers
(4) FAB449 - 6" x 5.75" x 1/2" Curved Washer

Single Bolt Guy Attachment BOM:
(1) Bent Thimble Bolt, 3/4" Diameter
(1) 3" Square Curved washer
(1) FAB186 - 3/4" Nuts A325 or 5 SAE Grade
(1) FAB187 - 3/4" Lock/Spring Washers
(2) FAB449 - 6" x 5.75" x 1/2" Curved Washer

4" Spacing Guy Attachment BOM:
(1) Pole Eye Plate
(2) 20" x 3/4" Bolt A325 or 5 SAE Grade
(2) FAB186 - 3/4" Nuts A325 or 5 SAE Grade
(2) FAB187 - 3/4" Lock/Spring Washers

NOTE: Detail shown for clarification purposes only. Hardware lengths and sizes are selected according to pole diameter and hardware dimensions. Consult manufacturer for alternate hardware availability.

3-Hole Curved Washers

Corresponding StormStrong Pole	Radius	Hole Dia.	Height	Width	Thickness	Part #
TU440 (10" dia)	5"	13/16"	5 3/4"	6"	3/8"	FAB549
TU440 (10" dia)	5"	11/16"	5 3/4"	6"	3/8"	FAB886
TU450 (12" dia)	6"	13/16"	5 3/4"	6"	1/2"	FAB448
TU450 (12" dia)	6"	11/16"	5 3/4"	6"	1/2"	FAB884
TU460 (16" dia)	8"	13/16"	5 3/4"	6"	1/2"	FAB449
TU460 (16" dia)	8"	11/16"	5 3/4"	6"	1/2"	FAB885

Contact CCG for Autocad and Inventor part files

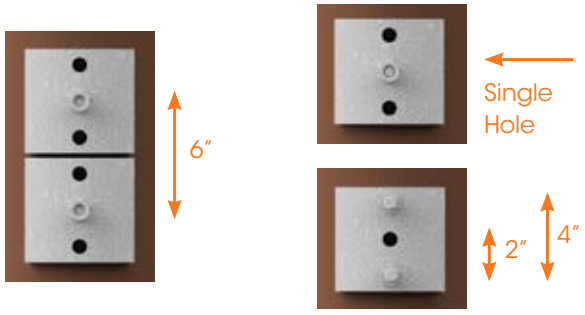
Galvanized Steel Wire Strengths

Nominal Dia. (in)	Construction	Minimum Breaking Load (lbs)	
		Utilities Grade	Extra High Strength Grade
9/32	1 x 7	4,600	8,950
5/16	1 x 7	6,000	11,200
3/8	1 x 7	11,500	15,400
7/16	1 x 7	18,000	20,800
1/2	1 x 7	25,000	26,900

Represents typical strengths

The 3-hole curved washer system allows for attachment of traditional guy hardware to StormStrong Utility Poles with vertical hole spacings of 2", 4", and 6". For hardware with hole spacings exceeding 6", best practice is to match-fit the spacing with washer center-holes. The 6"x 5.75"x 1/2" curved washers are mounted on the pole face opposite to guy attachments to distribute applied loads across the pole surface.

A single curved washer can be used to accommodate attachments that require only (1) center hole, or 2" & 4" hole spacings. Two curved washers can be used to accommodate attachments with 6" and greater hole spacings. All curved washers are composed of Grade 50 steel or equivalent and galvanized in accordance with ASTM A123.

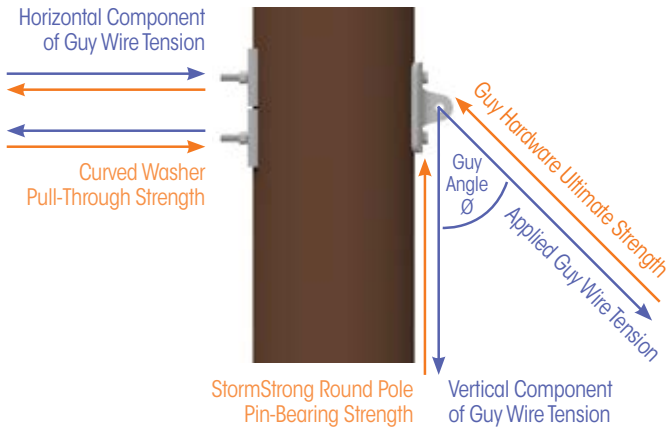


Guy wires are used in the utility industry to counteract horizontal forces that utility poles experience in the field. This is achieved by mounting guy hardware to a utility pole at an angle (Ø), typically between 15° and 45°. When designing pole hardware to resist an applied guy wire tension, there are 3 component forces to consider:

1. Guy Hardware Ultimate Strength must be stronger than an applied guy wire tension. This strength is typically provided by the hardware manufacturer.

2. Curved Washer Pull-Through Strength must be stronger than the horizontal component of an applied guy wire tension at an angle (Ø). CCG's curved washers are engineered to distribute these horizontal forces across the pole surface evenly and must be used on the backside of any mounted guy hardware.

3. StormStrong Round Pole Pin-Bearing Strength must be stronger than the vertical component of an applied guy wire tension at an angle (Ø). The pin-bearing strength of a pole dictates the maximum guy wire tension that can be applied to mounted guy hardware. Thru-bolt quantity directly correlates with the pin bearing capacity of a pole, so hardware with multiple bolts can withstand greater wire tensions.



The "Characteristic Strength of Bolted Guy Hardware" table below shows the maximum guy wire tension that can be applied to guy hardware at varying angles. Multiple hardware articles can be used together to increase the capacity of a guying system.

Characteristic Strength of Bolted Guy Hardware

Guy Hardware	Number of Thru Bolts	Bolt Diameter (in)	Guy Angle Ø	Hardware Ultimate Strength (lbf)	Maximum Applied Guy Wire Tension (lbf)			
					10 in Dia. x 3/8" Round Pole TU440	12 in Dia. x 3/8" Round Pole TU455	12 in Dia. x 1/2" Round Pole TU450	16 in Dia. x 1/2" Round Pole TU460
FAB887 DE Tee bracket	2	3/4	15	30,000	16,100	11,900	19,000	15,500
	2	3/4	30		18,000	13,300	21,200	17,300
	2	3/4	45		22,000	16,300	26,000	21,300
Pole Eye Plate	2	5/8	15	21,000	13,400	9,900	15,900	12,900
	2	5/8	30		15,000	11,100	17,700	14,400
	2	5/8	45		18,300	13,600	21,700	17,700
Bent Thimble Eye Bolt (5/8")	1	5/8	15	13,550	6,700	4,900	7,900	6,400
	1	5/8	30		7,500	5,500	8,800	7,200
	1	5/8	45		9,100	6,800	10,800	8,800
Bent Thimble Eye Bolt (3/4")	1	3/4	15	20,050	8,000	5,900	9,500	7,700
	1	3/4	30		9,000	6,600	10,600	8,600
	1	3/4	45		11,000	8,100	13,000	10,600

Notes:
Clearance hole 1/16" over nominal bolt diameter.
Characteristic strength is based on the 5% LEL lengthwise pin bearing strength. (Safety Factors are required to be applied)
Lengthwise pin bearing strength controls design over 6"x5.75"x3/8" washer pull-through strength & Guy Attachment Strength
Hardware with a FAB # can be purchased directly through CCG - all other hardware can be purchased via utility hardware distributors

CREATIVE COMPOSITES GROUP

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