

700

GUYS AND ANCHORS

3/14/2011

C	G	Guy and Anchor Selection
C	G0	Guy and Anchor Chart
C	G1A,G2A, G3A	Single Helix Screw Anchors
C	G3,G4	Expanding and Crossplate Anchors
C	G4A, G4B	Multi-Helix Screw Anchors
C	G5	Sidewalk Guy
C	G9,G10	Rock Anchors
C	G30-G37	Double Guy Attachments
C	G40-G45	Single Guy Attachments
C	GDG50- GDG81	Down Guys
C	GSG50- GSG85	Span Guys

N	New Standard
R	Redrawn Standard
C	Changed Standard
~	No Change

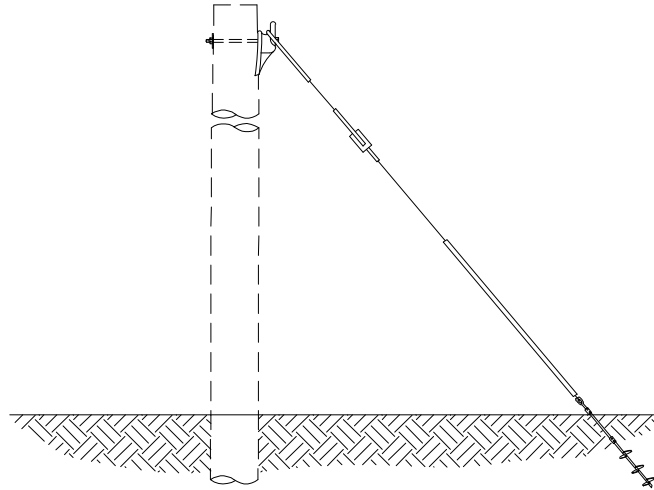
SCOPE

This section covers selection of down guys, span guys, sidewalk guys, push braces and anchors. The selections are based upon wood strengths, guy component strengths, anchor strengths and soil holding power of anchors.

DEFINITIONS (Taken from The Lineman's and Cableman's Handbook, Seventh Edition)

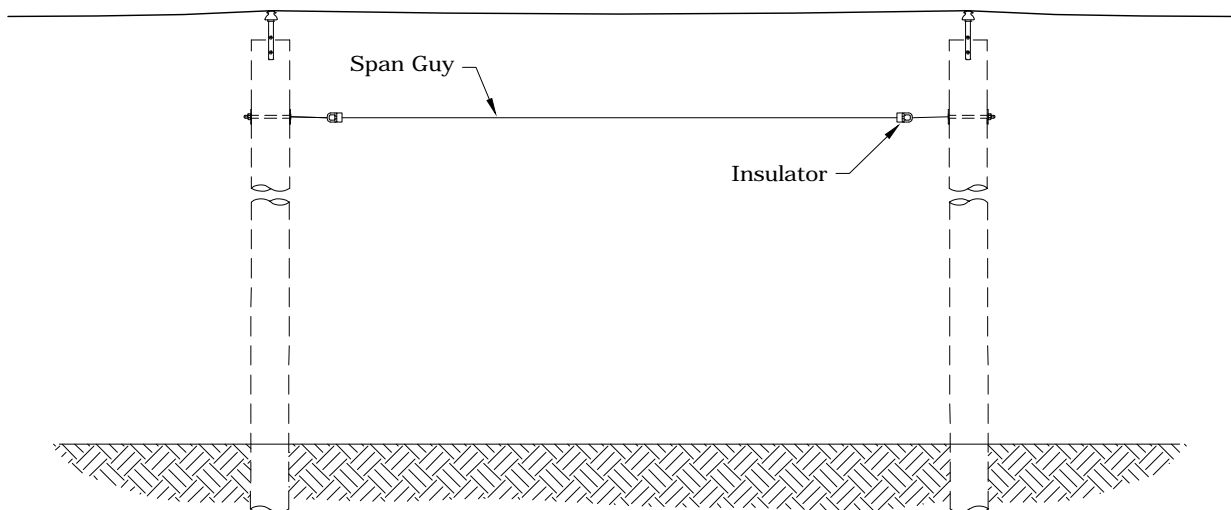
1. Down Guy-

Consists of a wire running from the attachment near the top of the pole to a rod and anchor installed in the ground.




2. Span Guy-

Consists of a guy wire installed from the top of a pole to the top of an adjacent pole to remove the strain from the line conductors.

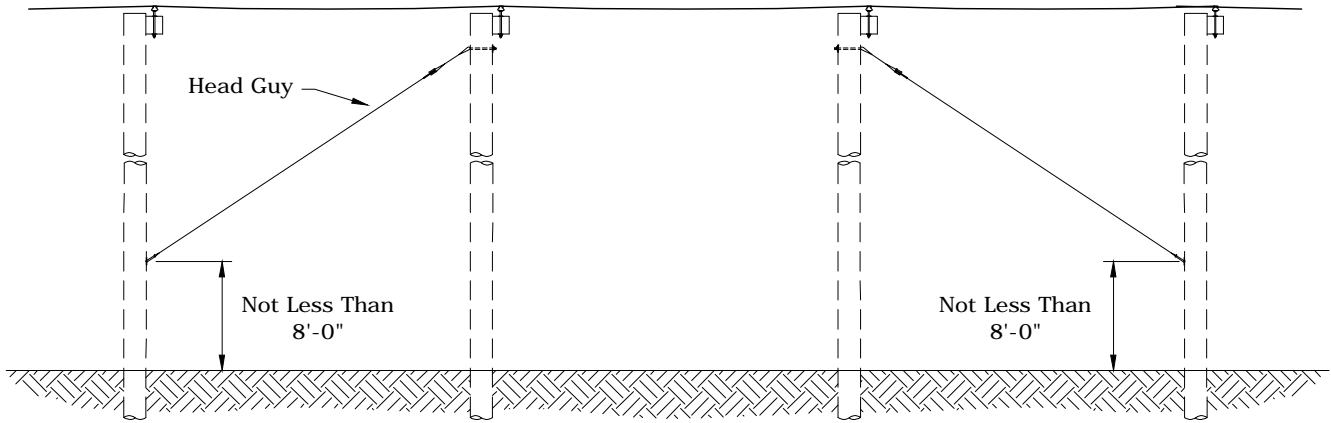


Rev 2: Added definitions and updated to 2007 NESC.

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PAGE: 1 of 7		G			CAD FILE: G		APP: GGW DATE: 4/1/86		SECTION 700

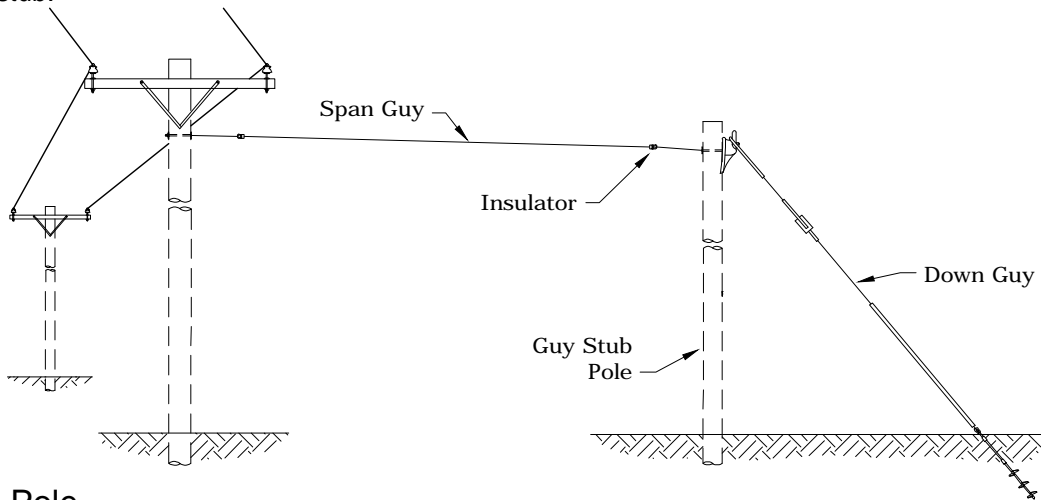
3. Head Guy-

A guy wire running from the top of a pole to a point below the top of the adjacent pole.



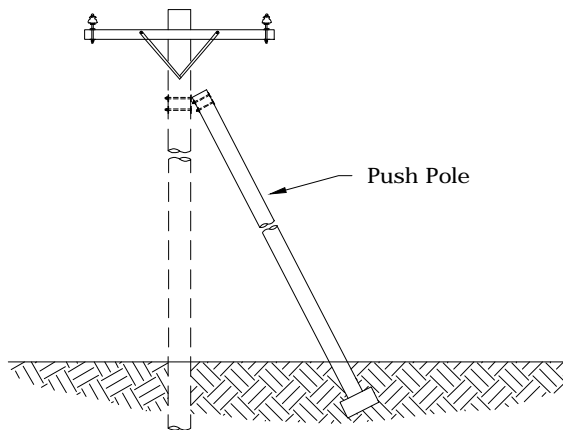
4. Guy Stub-

A guy wire installed between a line pole and a stub pole. The span guy, guy stub pole, and the down guy make up the guy stub.



5. Push Pole-

A pole used as a brace to a line pole.



Rev 2: Added definitions and updated to 2007 NESC.



CONSTRUCTION STANDARDS

GUY & ANCHOR SELECTION

REVISIONS

REVISION	DATE	ENGR	OPS
1	2/22/00	JEH	
2	2/24/11	CM	AH

PAGE:
2 of 7

G

CAD FILE:
G

APP: GWG
DATE: 4/1/86

SECTION
700

GENERAL

1. Guying

- a) Guying assemblies include down, span and sidewalk types. A push brace consisting of a pole and attachment fittings may be used in place of tensioned wire guying only where tension guying is impossible by reason of location or rights-of-way.
- b) Guying requirements can often be advantageously combined on a deadend pole, a span or more away by extending the circuit or by use of span guys in order to provide a reduced combined guying load on the same pole. A sidewalk guy is an expensive method of guying and provides limited support, particularly on taller poles, due to the comparatively short guy lead. DO NOT use a sidewalk guy if a down or span guy is possible.
- c) Guy assemblies are designed for the maximum allowable load which may be supported by the pole and the related hardware. Heavy duty guying will normally require the use of multiple guying attachments.
- d) A guy marker shall be used on all down guy and sidewalk guy locations. A minimum of one marker per anchor is required. It should be noted that guy markers DO NOT PROTECT OR "GUARD" a down/sidewalk guy, but rather warn the public of its presence.

2. Sidewalk Guy Insulation

Sidewalk guys shall have guy insulators installed in the guy strand above the horizontal guy strut. The breakers should be at a point that will allow at least 6" clearance between the breaker and the strut attachment to the pole, should the guy wire become broken.

3. Grounded Guys

Grounded guys shall not be used. All guys on transmission and distribution circuits shall have insulation sections (Johnny balls or fiberglass rods) installed on all new and rebuilt circuits. Grounded guys are to be replaced by insulated guys when work is done on that pole.

4. Application of Guy Insulators

It is impractical to show every NESC requirement for applying guy strain insulators. A clear understanding of the rules will provide for the correct applications. These guidelines will help in understanding the requirements.


Guideline 1 (see figure #1) - All down guys shall have a minimum of one guy insulator. (NESC 215C2)

Guideline 2 - All span guys will have a minimum of two guy insulators. (NESC 215C5)

Guideline 3 (see figure #2) - On jointly used poles, down guys that pass within 12 inches of supply conductors, and also pass within 12 inches of communication cables, shall be insulated with a guy insulator at a point below the lowest supply conductor and above the highest communication cable. (NESC 235I)

Guideline 4 (see figure #1) - All guy insulators shall be located at least 8 feet above the ground including when the guy would sag or break. (NESC 215C5a)

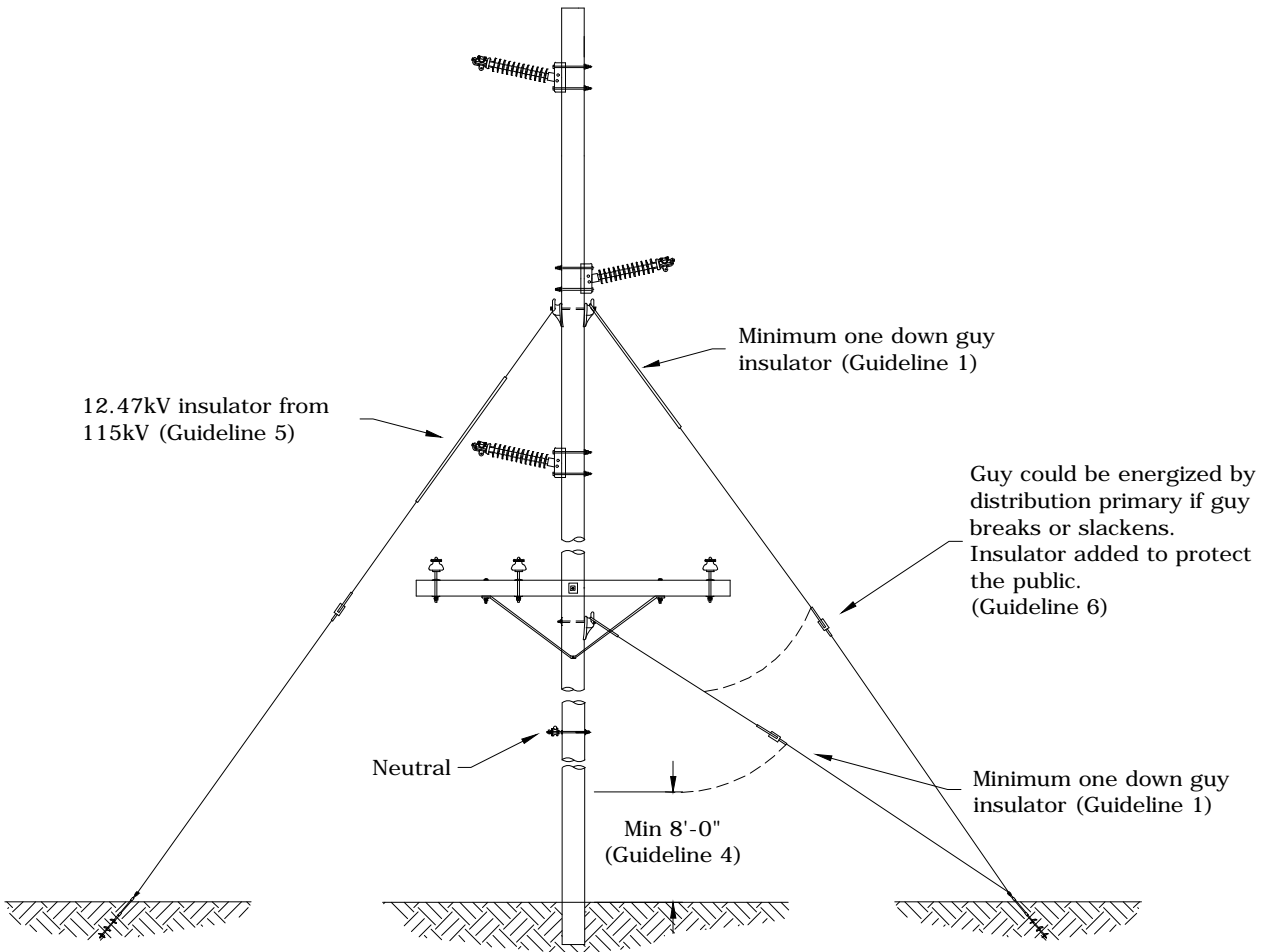
Rev 2: Added definitions and updated to 2007 NESC.

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			2	2/24/11	CM	AH
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PAGE: 3 of 7	G		CAD FILE: G	APP: GGW	SECTION 700	
			DATE: 4/1/86			

Guideline 5 (see figure #1) - Guy insulators shall be placed so that in case any guy wire contacts, or is contacted by an energized conductor or part, the voltage will not be transferred to other facilities on the structure. (NESC 215C5b)

Guideline 6 (see figure #3) - Guys may sag or break, bringing them into contact with energized conductors, jumpers, or bushings to create a hazard to the public. Guy insulators shall be placed so that when any guy sags down or falls upon another facility, the insulators will remain effective. (NESC 215C5c)

Figure 1: Guidelines 1, 4, 5, and 6



Rev 2: Added definitions and updated to 2007 NESC.


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Figure 2: Guying near communication cable (Guideline 3)

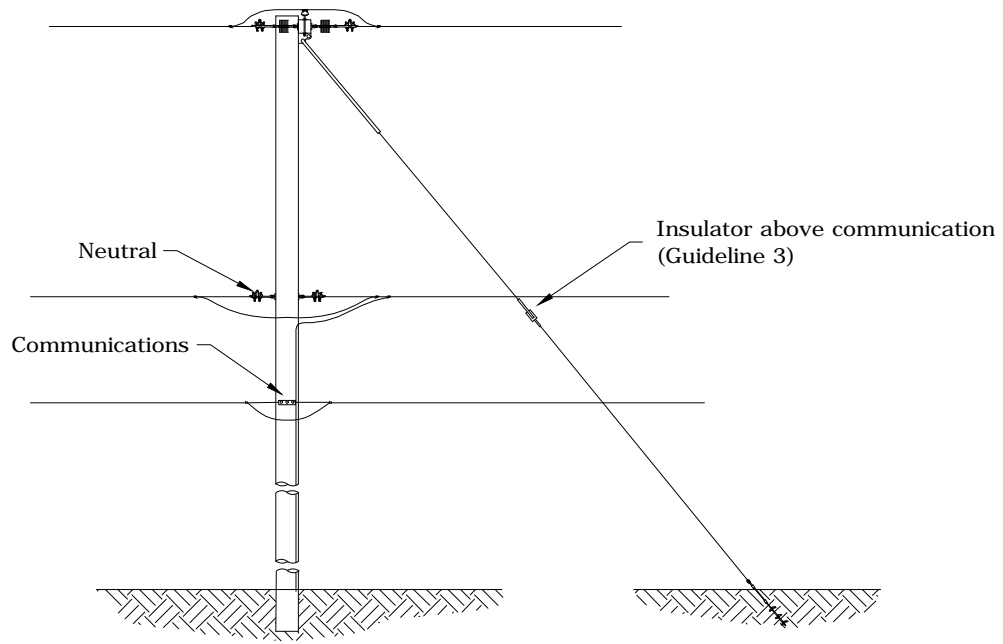
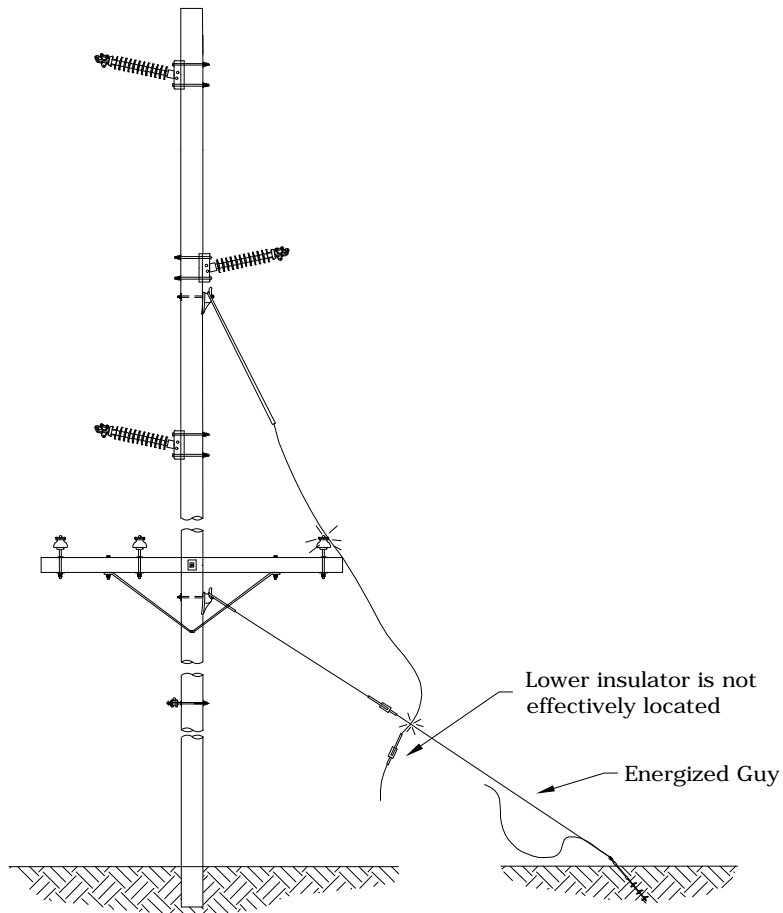



Figure 3: Allow for guys to sag or break (Guideline 6)



Rev 2: Added definitions and updated to 2007 NESC.

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				APP: GGW	SECTION	
				DATE: 4/1/86	700	

5. Anchors

Anchors shall be located so as to provide as large a lead over height ratio with as little interference to the public as possible.

ANCHOR SELECTION

1. Anchor Selection in General




- a. Anchor selection is based upon guy tension, type of soil, available installation equipment and location.
- b. Power installed screw anchors are the best choice if soil and location permit their use.
- c. A plate anchor may be used if a hole can be dug either by machine or blasting or hand dug at inaccessible locations.
- d. If solid rock is encountered, specify one of the rock anchors.
- e. Some swamp areas cannot be covered by these anchors and must have special design consideration.

2. Soil Classification

The table of soil classification data which follows is for general use in specifying anchors.

SOIL CLASSIFICATION DATA			
CLASS	PROBE VALUE	COMMON SOIL-TYPE DESCRIPTION	GEOLOGICAL SOIL CLASSIFICATION
0	-	Sound hard rock, unweathered	Granite, Basalt, Massive Limestone
1	750-1600 in-lbs	Very dense and/or cemented sands; coarse gravel and cobbles	Caliche, (nitrate-bearing gravel/rock)
2	600-750 in-lbs	Dense fine sand; very hard silts and clays (may be preloaded)	Basal Till; Boulder Clay; Caliche; Weathered Laminated Rock
3	500-600 in-lbs	Dense sands and gravel; hard silts and clays	Glacial Till; Weathered Shales, Schist, Gneiss and Siltstone
4	400-500 in-lbs	Medium dense sand and gravel; very stiff to hard silts and clays	Glacial Till, Hardpan and Marls
5	300-400 in-lbs	Medium dense coarse sands and sandy gravels; stiff to very stiff silts and clays	Saprolites, Residual Soils
6	200-300 in-lbs	Loose to medium dense fine to coarse sands to stiff clays and silts	Dense Hydraulic Fill; Compacted Fill; Residual Soils
7	100-200 in-lbs	Loose fine sand; alluvium; loess; medium-stiff and varied clays; fill	Flood Plain Soils; Lake Clays; Adobe; Gumbo, Fill
8	< 100 in-lbs	Peat, organic silts; inundated silts, fly ash, very loose sands, very soft to soft clays	Miscellaneous Fill, Swamp Marsh

Rev 2: Added definitions and updated to 2007 NESC.




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				DATE	ENGR	OPS
	1	2/22/00	JEH			
	2	2/24/11	CM	AH		
	G		APP: GGW	SECTION 700		
PAGE: 6 of 7	G		CAD FILE: G	DATE: 4/1/86	700	

CONVERTING HYDRAULIC PRESSURE TO TORQUE

If a shear pin torque indicator is not going to be used, the operator can make a conversion chart so that pounds per square inch of system hydraulic pressure can be converted to torque at the anchor. This chart can be made by temporarily using a shear pin torque indicator and recording maximum hydraulic pressure readings when various numbers of pins shear. Each pin is equal to 500 ft-lb of torque. After the conversion chart is completed, it is not necessary to use the shear pin torque indicator. Any changes in the hydraulic motor system will require a new conversion chart. Check the accuracy of the chart annually, after any hydraulic system repairs, or before critical anchor installation such as mainline, distribution lines, or transmission lines.

TRUCK # _____		CHART DATE _____	OPERATOR _____
SYSTEM HYDRAULIC PRESSURE LBS./SQ. IN.	TORQUE IN FT. LBS	NUMBER OF SHEARED PINS	NOTES
	500	1	
	1000	2	
	1500	3	
	2000	4	
	2500	5	
	3000	6	
	3500	7	
	4000	8	
	4500	9	
	5000	10	
	5500	11	
	6000	12	
	6500	13	
	7000	14	

Rev 2: Added definitions and updated to 2007 NESC.

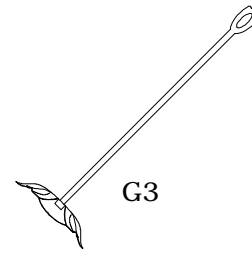
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PAGE: 7 of 7	G		CAD FILE: G	APP: GGW	SECTION 700	
			DATE: 4/1/86			



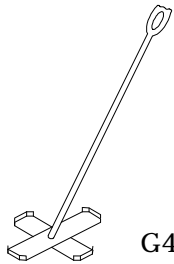
G1A



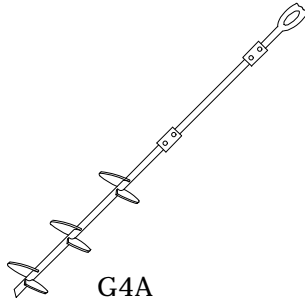
G2A, G3A



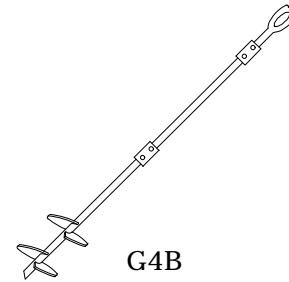
G3



G4



G4A



G4B



G9, G10

GUY & ANCHOR CHART			
NAME	ANCHOR	ROD SIZE	ULTIMATE HOLDING CAPACITY*
G1A	6" Handscrew	3/4"	6,500
G2A	10" Helix	1"	34,800
G3	12" Expanding Plate	1 1/4"	40,000
G3A	14" Helix	1"	36,000
G4	24" Crossplate	1 1/4"	58,000
G4A	Triple Helix 8-10-12"	1 3/4"	100,000
G4B	Double Helix 8-10"	1 3/4"	100,000
G9	Rock	1"	36,000
G10	Rock	1"	36,000

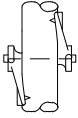
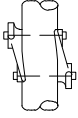
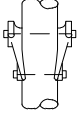
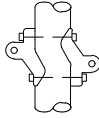
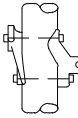
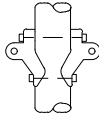
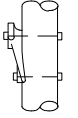
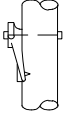
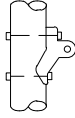

* SEE ACTUAL STANDARD FOR CAPACITY CHARTS

Rev 2: Obsoleted G1, G2, G3B, G3C, G5A, G6Y, and G9A, and moved G5 to page 2.

	CONSTRUCTION STANDARDS GUY & ANCHOR CHART ANCHORS		REVISIONS				
				DATE	ENGR	OPS	
	1	2/23/00	HWH	MA	2	2/24/11	CM
PAGE: 1 of 2	G0		CAD FILE: G0	APP: JEH DATE: 2/22/00	SECTION 700		

ATTACHMENTS

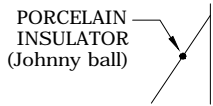
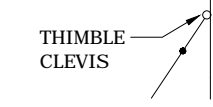
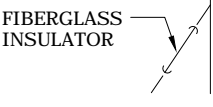


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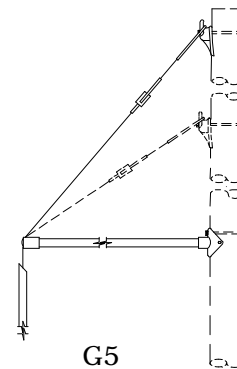
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	G34	35,520	26,480
	G35	23,120	19,360
	G36	23,120	19,360
	G37	35,520	26,480
	G40	23,120	19,360
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	G45	11,560	9,680

NOT THREADED




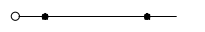
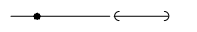


* Apply Safety Factors per NESC

DOWN GUYS

	10M	18M
 PORCELAIN INSULATOR (Johnny ball)	GDG50	GDG51
 THIMBLE CLEVIS	GDG52	GDG53
 FIBERGLASS INSULATOR	GDG70	GDG71
	GDG72	GDG73
	GDG80	GDG81



SPAN GUYS

	10M	18M
	GSG50	GSG51
	GSG52	GSG53
	GSG54	GSG55
	GSG56	GSG57
	GSG70	GSG71
	GSG82	GSG83
	GSG84	GSG85

Rev 2: Obsoleted G44, GSG55, GSG60, GSG62, and added G45, GSG54, GSG55, GSG56, and GSG57.



CONSTRUCTION STANDARDS


GUY & ANCHOR CHART
SPAN GUYS, DOWN GUYS, ATTACHMENTS

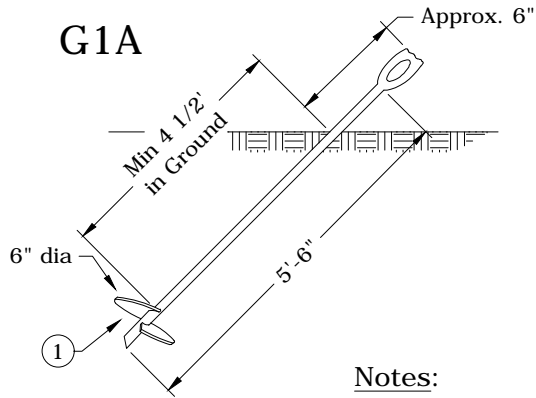
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REVISIONS

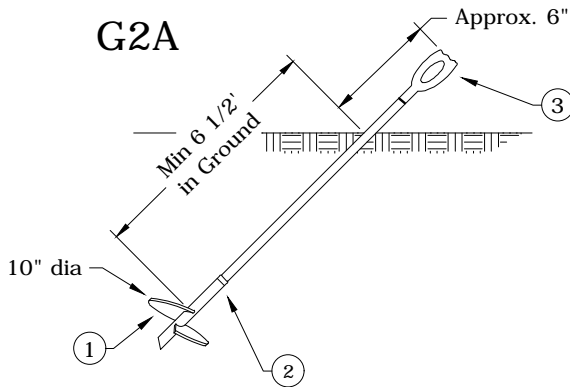
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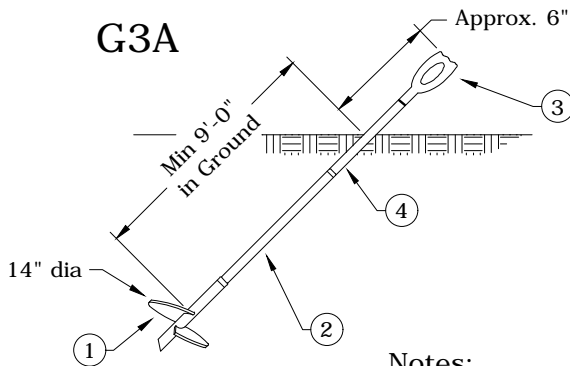
G1A	
ULTIMATE HOLDING CAPACITY	
Soil Class	(lbs)
7	2,500
6	5,000
5	6,500
Max Torque Rating is 400 ft-lbs.	

Notes:

1. Only this anchor may be hand installed (use in #5 to #7 soil).
2. A minimum of 4 1/2' of the G1A anchor/rod from the top of the helix must be in the ground to obtain rated holding capacity.



ULTIMATE HOLDING CAPACITY		
	G2A	G3A
Torque	(lbs)	
(ft-lbs)	10" Helix 1" x 7' Rod	14" Helix 1" x 7' Rod + 3 1/2' Rod
500	4,200	7,350
1,000	7,600	10,700
1,500	11,000	14,050
2,000	14,400	17,400
2,500	17,800	20,750
3,000	21,200	24,100
3,500	24,600	27,450
4,000	28,000	30,800
4,500	31,400	34,150
5,000	34,800	36,000



Notes:

1. A minimum of 6 1/2' of the G2A anchor/rod from the top of the helix must be in the ground to obtain the rated holding capacity.
2. A minimum of 9' of the G3A anchor/rod from the top of the helix must be in the ground to obtain the rated holding capacity.

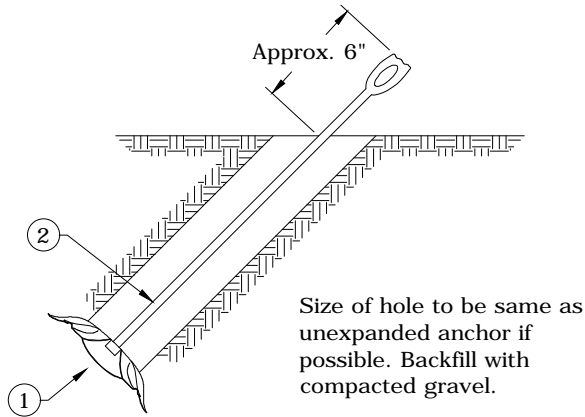
Rev 3: Removed G3B and G3C, added material list, corrected notes, and added holding power tables.



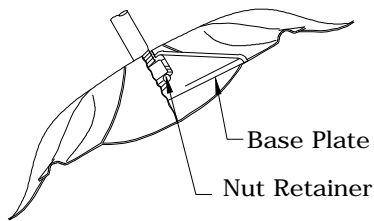
CONSTRUCTION STANDARDS
SINGLE HELIX SCREW ANCHORS

REVISIONS											
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**EXPANDING
G3**

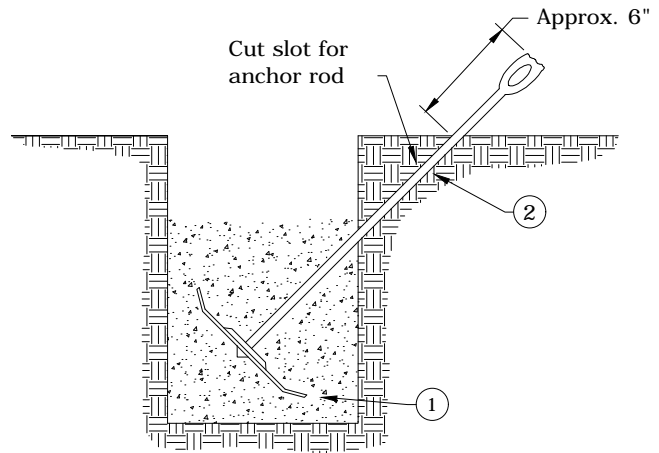


Size of hole to be same as unexpanded anchor if possible. Backfill with compacted gravel.



**CROSSPLATE
G4**

(See Notes 5 & 6)



Note: Ultimate tensile strength of 1 1/4" rod is 58,000 lbs. ultimate.

ULTIMATE HOLDING CAPACITY (ft-lbs)	
SOIL TYPE	TYPE OF ANCHOR
	G3
	12" Expanding
	1 1/4" x 10' Rod
0	N/A
1	N/A
2	N/A
3	40,000
4	34,000
5	26,500
6	21,500
7	16,000
8	N/A

Notes:

1. See Std. G for application guidelines.
2. Install anchor rods at the same slope as the guy strand.
3. Anchor rod should emerge from ground at point where stake is located.
4. Holding capacity based on Chance anchoring systems.
5. A minimum of 2 yards of concrete are needed to hold the anchor. Place 90% of concrete in front of anchor.
6. 1 1/4" rod is rated 58,000 lbs. ultimate tensile.

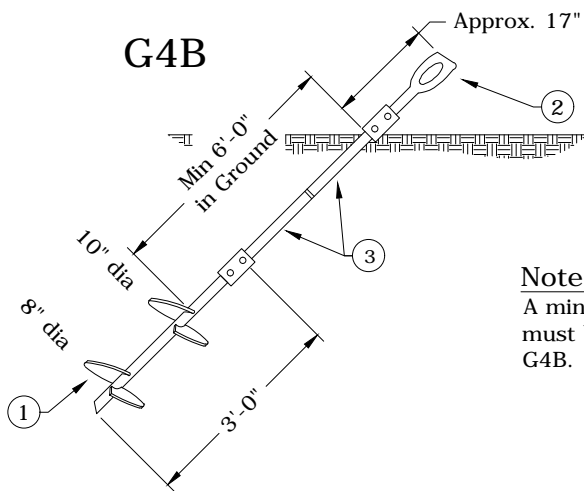
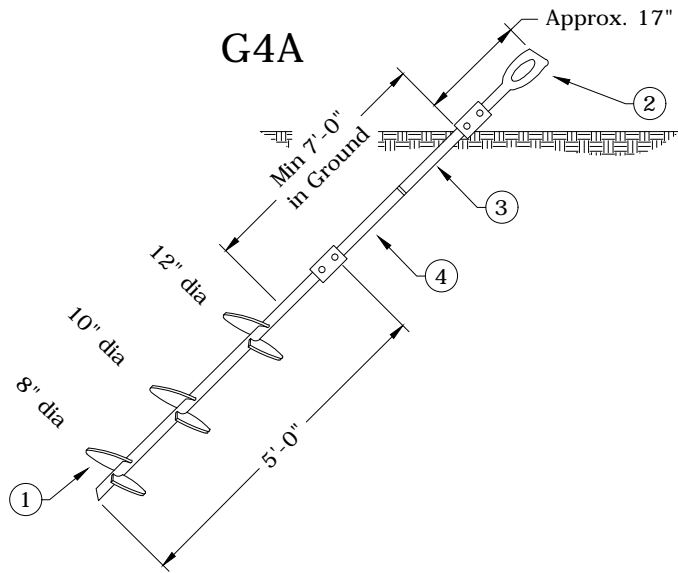
Rev 3: Updated strengths, obsoleted G1 & G2, changed title, corrected material, and added Note 4.

ITEM NO.	DESCRIPTION	G3	
		QTY.	S/N
1	Anchor, Expanding 12"	1	9
2	Rod, Anchor 1 1/4" x 10'	1	1118
ITEM NO.	DESCRIPTION	G4	
		QTY.	S/N
1	Anchor, Heavy Duty 24" Crossplate	1	10
2	Rod, Anchor 1 1/4" x 10'	1	1118



CONSTRUCTION STANDARDS
EXPANDING AND CROSSPLATE ANCHORS

REVISIONS											
NO.	DATE	ENGR.	OPS								
1	4/1/86	GGW	MA								
2	5/5/86	RWG	GGW								
3	2/24/11	CM	AH								
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APP:	ELM	SECTION									
DATE:	1/31/80	700									



Note:

A minimum of 7' of the anchor/rod from the top of the 12" helix must be in the ground to obtain the rated holding capacity for G4A.

ULTIMATE HOLDING CAPACITY		
Torque (ft-lbs)	G4A	G4B
	(lbs)	
	8-10-12" (3) 1 3/4" x 3 1/2' Rod	8"-10" (2) 1 3/4" x 3 1/2' Rod
500	NA	NA
1,000	NA	NA
1,500	19,000	17,000
2,000	25,000	23,000
2,500	31,000	29,000
3,000	38,000	34,000
3,500	44,000	40,000
4,000	50,000	46,000
4,500	56,000	52,000
5,000	62,000	58,000
5,500	69,922	64,140
6,000	76,279	69,971
6,500	82,635	75,802
7,000	88,992	81,633
7,500	95,348	87,464
8,000	100,000	93,295
8,500	100,000	99,126
9,000	100,000	100,000

Note:

A minimum of 6' of the anchor/rod from the top of the 10" helix must be in the ground to obtain the rated holding capacity for G4B.

Notes:

1. See Std. G for application guidelines.
2. Install anchor rods at the same slope as the guy strand.
3. The G4A is for use in soft soils and G4B can be used in hard or rocky soils. They will hold up to 100,000 lbs ultimate and can be installed with torque up to 11,000 ft-lbs (22 pins). Rod is 1 3/4" square shaft.
4. Use as many extensions as needed to obtain the desired torque.
5. Holding capacity based on Chance anchoring system.

Rev. 1 - Added material list, corrected drawings and notes.

ITEM NO.	DESCRIPTION	G4A	
		QTY.	S/N
1	8-10-12" Helix Screw Anchor, 100,000 lbs. Ultimate	1	15
2	Triple Eye 1 3/4" Guy Attachment	1	2522
3	3 1/2' Anchor Rod, 1 3/4" Square Shaft, 11,000 ft-lbs. Ultimate	1	2076
4	7' Anchor Rod, 1 3/4" Square Shaft, 11,000 ft-lbs. Ultimate	1	2077

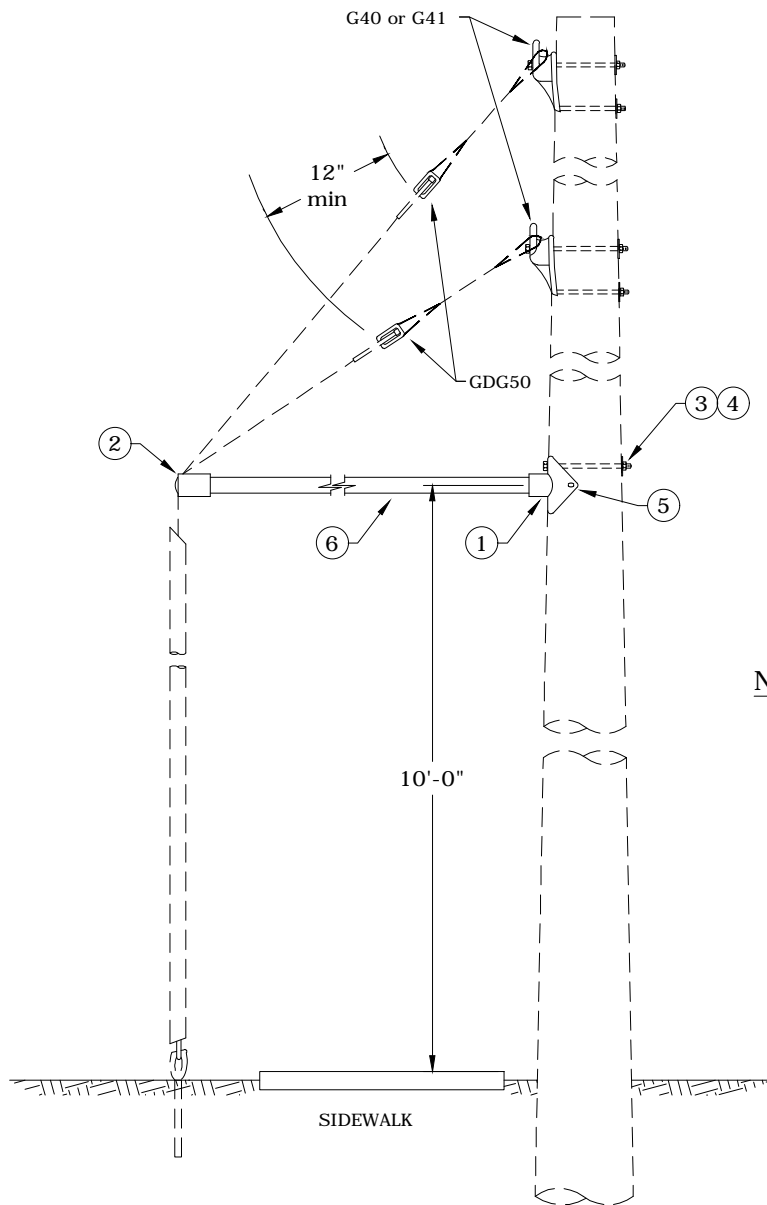
ITEM NO.	DESCRIPTION	G4B	
		QTY.	S/N
1	8-10" Helix Screw Anchor, 100,000 lbs. Ultimate	1	2074
2	Triple Eye 1 3/4" Guy Attachment	1	2522
3	3 1/2' Anchor Rod, 1 3/4" Square Shaft, 11,000 ft-lbs. Ultimate	2	2076



CONSTRUCTION STANDARDS
MULTI-HELIX SCREW ANCHORS

REVISIONS			
DATE	ENGR	OPS	
2/24/11	CM	AH	

PAGE: 1 of 1	CAD FILE: G4A	APP: RWG	SECTION: 700
		DATE: 5/9/80	



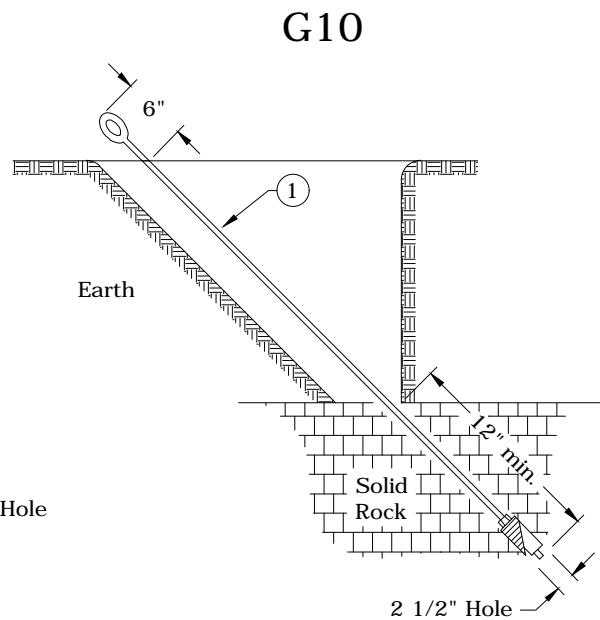
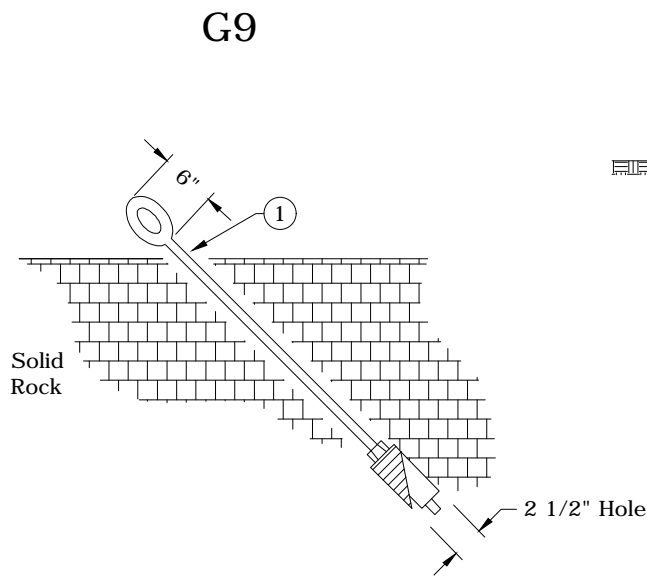
Notes:

1. Down guys and guy attachments are called for separately. Loading will determine whether one or two down guys are needed.
2. Sidewalk guys are only to be installed when 8' clearance over a sidewalk cannot be obtained with a down guy.

Rev. 2 - Corrected material lists and notes and removed G5A.

ITEM NO.	DESCRIPTION	G5	
		QTY.	S/N
1	Fitting, Sidewalk Guy-Pole	1	631
2	Fitting, Sidewalk Triple Guy	1	633 *
3	Bolt, Machine 5/8" x 12"	1	155
4	Washer, Curved, Square, Cast, 3" x 3" x 3/8" Thick x 13/16" Diameter	1	1392
5	Screw, Lag 1/2" x 4 1/2"	2	1132
6	Conduit, Rigid Galv 2" x 10'	1	407 *

	CONSTRUCTION STANDARDS		REVISIONS		
	SIDEWALK GUY		DATE	ENGR	OPS
	1	5/5/86	AWG	GWG	
	2	2/24/11	CM	AH	
PAGE: 1 of 1		G5	CAD FILE: G5	APP: ELM	SECTION 700
			DATE: 1/31/80		




Notes:

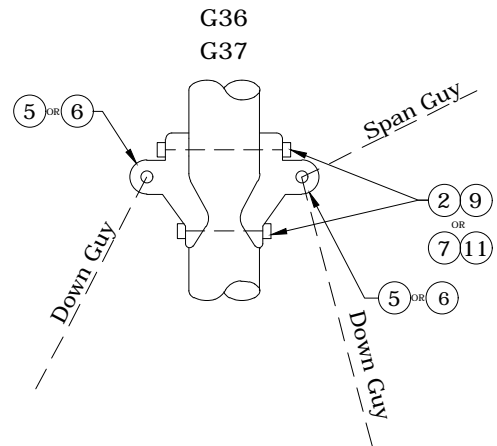
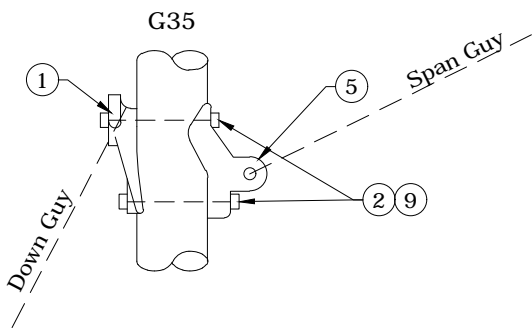
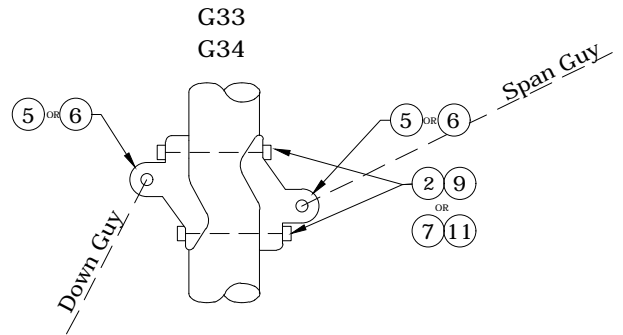
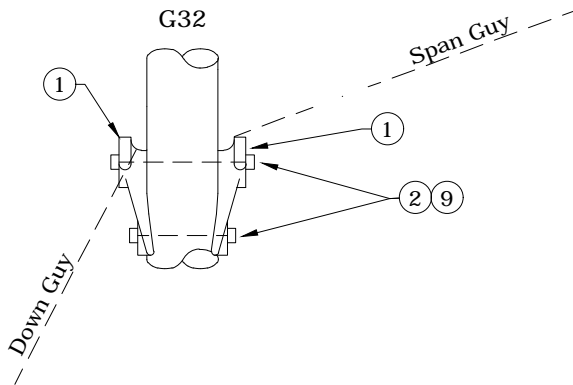
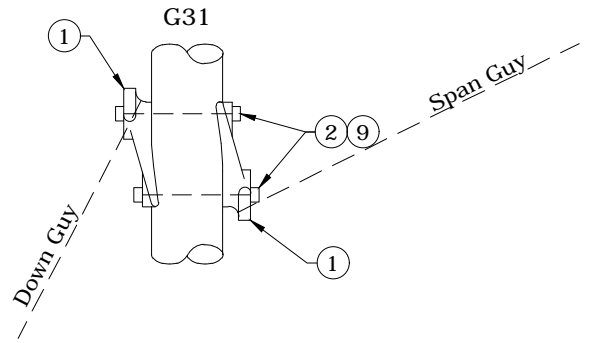
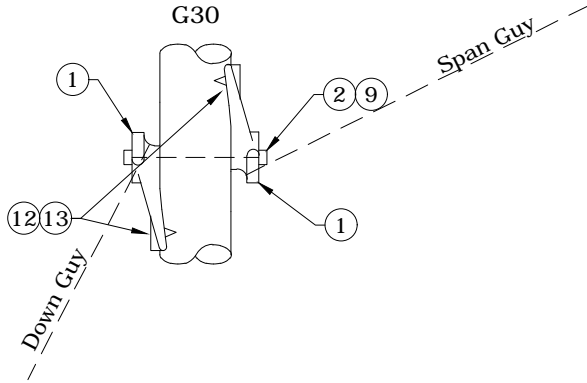
1. Install anchor rods at the same slope as the guy strand.
2. Rods have a 36,000 lbs. ultimate tensile strength.
3. Use only where other anchor assemblies cannot be installed because of insufficient overburden.
4. Installation procedure:
 - a) Drill 2 1/2" hole.
 - b) Push anchor into hole.
 - c) Put a bar in anchor eye, turn rod until anchor is firmly expanded.
 - d) Grout.

Rev. 2 - Corrected material list, drawings, and notes, and deleted G9A.

ITEM NO.	DESCRIPTION	G9	
		QTY.	S/N
1	Anchor, Rock 1" x 30", 36,000 lbs. Ultimate	1	17

ITEM NO.	DESCRIPTION	G10	
		QTY.	S/N
1	Anchor, Rock 1" x 53", 36,000 lbs. Ultimate	1	18

	CONSTRUCTION STANDARDS		REVISIONS			
	ROCK ANCHORS		DATE	ENGR	OPS	
			1 5/5/86	RWG	GGW	
			2 2/24/11	CM	AH	
PAGE: 1 of 1		G9, G10		CAD FILE: G9	APP: ELM	SECTION 700
				DATE: 1/31/80		



Rev. 1 - Added "double" to title, added types of guys to drawings, and corrected material lists.



CONSTRUCTION STANDARDS

DOUBLE GUY ATTACHMENTS

PAGE:
1 of 2


G30-G37

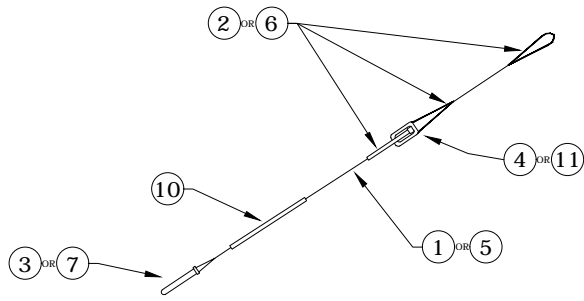
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G30

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NO.	DATE	ENGR	OPS
1	2/24/11	CM	AH
APP: GGW		SECTION	
DATE: 4/1/85		700	

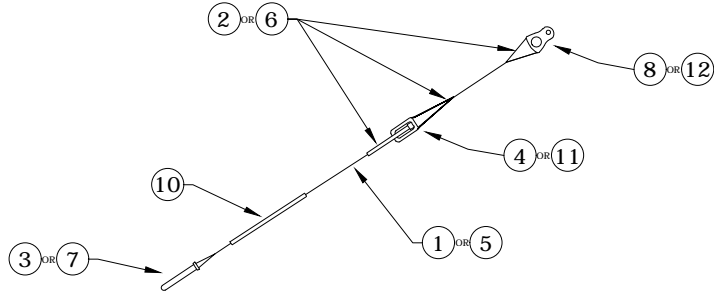
Rev. 1 - Added "double" to title, added types of guys to drawings, and corrected material lists.

ITEM NO.	DESCRIPTION	G30	
		QTY.	S/N
1	Guy Hook, 25,400 lbs. Ultimate Tensile	2	753
2	Machine Bolt, 3/4" x 16", 18,350 lbs. Ultimate Tensile	1	175
9	Double Coil Spring Lock Washer 3/4"	1	2218
12	1/2" x 4 1/2" Lag Screw	2	1132
13	1/2" Flat Round Washer	2	1394
ITEM NO.	DESCRIPTION	G31	
		QTY.	S/N
1	Guy Hook, 25,400 lbs. Ultimate Tensile	2	753
2	Machine Bolt, 3/4" x 16", 18,350 lbs. Ultimate Tensile	2	175
9	Double Coil Spring Lock Washer 3/4"	2	2218
ITEM NO.	DESCRIPTION	G32	
		QTY.	S/N
1	Guy Hook, 25,400 lbs. Ultimate Tensile	2	753
2	Machine Bolt, 3/4" x 16", 18,350 lbs. Ultimate Tensile	2	175
9	Double Coil Spring Lock Washer 3/4"	2	2218
ITEM NO.	DESCRIPTION	G33	
		QTY.	S/N
2	Machine Bolt, 3/4" x 16", 18,350 lbs. Ultimate Tensile	2	175
5	Pole Eye Plate, 21,000 lbs. Ultimate Tensile	2	988
9	Double Coil Spring Lock Washer 3/4"	2	2218
ITEM NO.	DESCRIPTION	G34	
		QTY.	S/N
6	Pole Eye Plate, 36,000 lbs. Ultimate Tensile	2	1908
7	Machine Bolt, 7/8" x 16", 25,400 lbs. Ultimate Tensile	2	1901
11	Double Coil Spring Lock Washer 7/8"	2	2351
ITEM NO.	DESCRIPTION	G35	
		QTY.	S/N
1	Guy Hook, 25,400 lbs. Ultimate Tensile	1	753
2	Machine Bolt, 3/4" x 16", 18,350 lbs. Ultimate Tensile	2	175
5	Pole Eye Plate, 21,000 lbs. Ultimate Tensile	1	988
9	Double Coil Spring Lock Washer 3/4"	2	2218
ITEM NO.	DESCRIPTION	G36	
		QTY.	S/N
2	Machine Bolt, 3/4" x 16", 18,350 lbs. Ultimate Tensile	2	175
5	Pole Eye Plate, 21,000 lbs. Ultimate Tensile	2	988
9	Double Coil Spring Lock Washer 3/4"	2	2218
ITEM NO.	DESCRIPTION	G37	
		QTY.	S/N
6	Pole Eye Plate, 36,000 lbs. Ultimate Tensile	2	1908
7	Machine Bolt, 7/8" x 16", 25,000 lbs. Ultimate Tensile	2	1901
11	Double Coil Spring Lock Washer 7/8"	2	2351

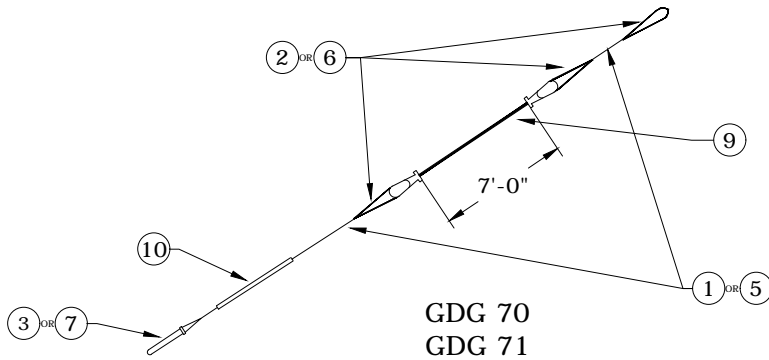
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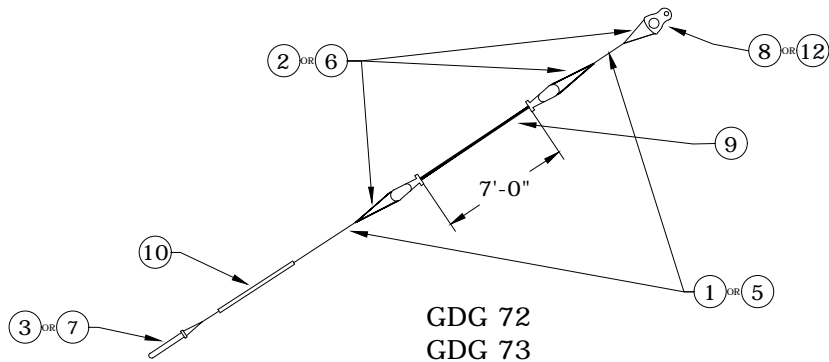
GDG 50
GDG 51



GDG 52
GDG 53



GDG 70
GDG 71



GDG 72
GDG 73

Rev. 1 - Removed uninsulated guys (GDG60-63), and corrected drawings and material issue.

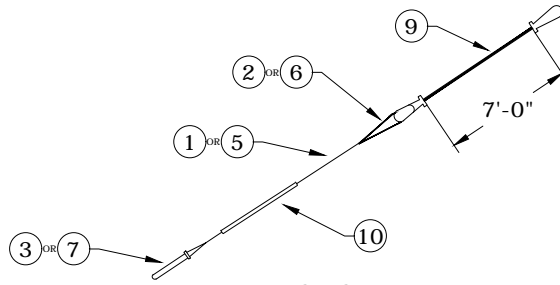


CONSTRUCTION STANDARDS

DOWN GUYS

REVISIONS			
Δ	DATE	ENGR	OPS
1	2/24/11	CM	AH

APP:	GGW	SECTION
DATE:	4/1/86	700



GDG 80
GDG 81

Notes:

1. If more than one guy will be attached to one anchor, an additional long automatic guy grip must be called for:
S/N 1190- 10M Long Auto Guy Grip
S/N 1192- 18M Long Auto Guy Grip
2. 3' and 10' Fiberglass Strain Insulators must be called for separately:
S/N 776- 3' Fiberglass Strain Insulator
S/N 1678- 10' Fiberglass Strain Insulator

Rev. 1 - Removed uninsulated guys (GDG60-63), and corrected drawings and material issue.

ITEM NO.	DESCRIPTION	GDG50	
		QTY.	S/N
1	Guy Wire, 10M	45ft	1419
2	Guy Grip, 10M, Preformed	3	713
3	Guy Grip, 10M, Automatic, Short	1	1189
4	Insulator, Guy Strain Small, 12,000 lbs. Ultimate, ANSI 54-2	1	780
10	Marker, Guy 8' Yellow	1	1061

ITEM NO.	DESCRIPTION	GDG51	
		QTY.	S/N
5	Guy Wire, 18M	45ft	1420
6	Guy Grip, 18M, Preformed	3	714
7	Guy Grip, 18M, Automatic, Short	1	1191
10	Marker, Guy 8' Yellow	1	1061
11	Insulator, Guy Strain Large, 20,000 lbs. Ultimate, ANSI 54-3	1	781

ITEM NO.	DESCRIPTION	GDG52	
		QTY.	S/N
1	Guy Wire, 10M	45ft	1419
2	Guy Grip, 10M, Preformed	3	713
3	Guy Grip, 10M, Automatic, Short	1	1189
4	Insulator, Guy Strain Small, 12,000 lbs. Ultimate, ANSI 54-2	1	780
8	Clevis, Thimble 1 1/4"	1	1628
10	Marker, Guy 8' Yellow	1	1061

ITEM NO.	DESCRIPTION	GDG53	
		QTY.	S/N
5	Guy Wire, 18M	45ft	1420
6	Guy Grip, 18M, Preformed	3	714
7	Guy Grip, 18M, Automatic, Short	1	1191
10	Marker, Guy 8' Yellow	1	1061
11	Insulator, Guy Strain Large, 20,000 lbs. Ultimate, ANSI 54-3	1	781
12	Clevis, Thimble 2 1/4"	1	1912



CONSTRUCTION STANDARDS

DOWN GUYS

PAGE:
2 of 3

GDG50 - GDG81

CAD FILE:
GDG50

REVISIONS			
DATE	ENGR	OPS	
2/24/11	CM	AH	

APP: GGW
DATE: 4/1/86

SECTION
700

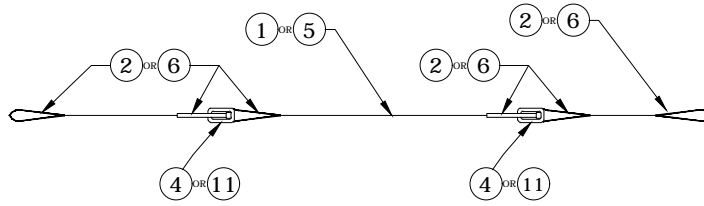
Rev. 1 - Removed uninsulated guys (GDG60-63), and corrected drawings and material issue.

ITEM NO.	DESCRIPTION	GDG70	
		QTY.	S/N
1	Guy Wire, 10M	45ft	1419
2	Guy Grip, 10M, Preformed	3	713
3	Guy Grip, 10M, Automatic, Short	1	1189
9	Insulator, Fiberglass, 2 Wheel, 7', 21,000 lbs. Ultimate, 530kV Wet Flashover	1	778
10	Marker, Guy 8' Yellow	1	1061
ITEM NO.	DESCRIPTION	GDG71	
		QTY.	S/N
5	Guy Wire, 18M	45ft	1420
6	Guy Grip, 18M, Preformed	3	714
7	Guy Grip, 18M, Automatic, Short	1	1191
9	Insulator, Fiberglass, 2 Wheel, 7', 21,000 lbs. Ultimate, 530kV Wet Flashover	1	778
10	Marker, Guy 8' Yellow	1	1061
ITEM NO.	DESCRIPTION	GDG72	
		QTY.	S/N
1	Guy Wire, 10M	45ft	1419
2	Guy Grip, 10M, Preformed	3	713
3	Guy Grip, 10M, Automatic, Short	1	1189
9	Insulator, Fiberglass, 2 Wheel, 7', 21,000 lbs. Ultimate, 530kV Wet Flashover	1	778
10	Marker, Guy 8' Yellow	1	1061
12	Clevis, Thimble, 2 1/4" Diameter	1	1912
ITEM NO.	DESCRIPTION	GDG73	
		QTY.	S/N
5	Guy Wire, 18M	45ft	1420
6	Guy Grip, 18M, Preformed	3	714
7	Guy Grip, 18M, Automatic, Short	1	1191
9	Insulator, Fiberglass, 2 Wheel, 7', 21,000 lbs. Ultimate, 530kV Wet Flashover	1	778
10	Marker, Guy 8' Yellow	1	1061
12	Clevis, Thimble, 2 1/4" Diameter	1	1912
ITEM NO.	DESCRIPTION	GDG80	
		QTY.	S/N
1	Guy Wire, 10M	45ft	1419
2	Guy Grip, 10M, Preformed	1	713
3	Guy Grip, 10M, Automatic, Short	1	1189
9	Insulator, Fiberglass, 2 Wheel, 7', 21,000 lbs. Ultimate, 530kV Wet Flashover	1	778
10	Marker, Guy 8' Yellow	1	1061
ITEM NO.	DESCRIPTION	GDG81	
		QTY.	S/N
5	Guy Wire, 18M	45ft	1420
6	Guy Grip, 18M, Preformed	1	714
7	Guy Grip, 18M, Automatic, Short	1	1191
9	Insulator, Fiberglass, 2 Wheel, 7', 21,000 lbs. Ultimate, 530kV Wet Flashover	1	778
10	Marker, Guy 8' Yellow	1	1061

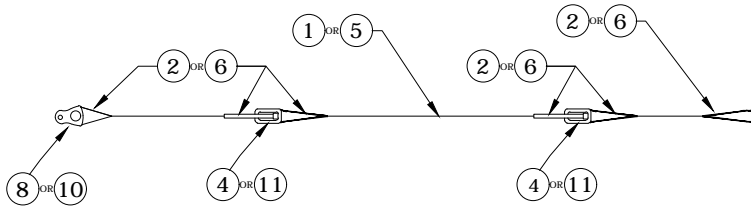


CONSTRUCTION STANDARDS
DOWN GUYS

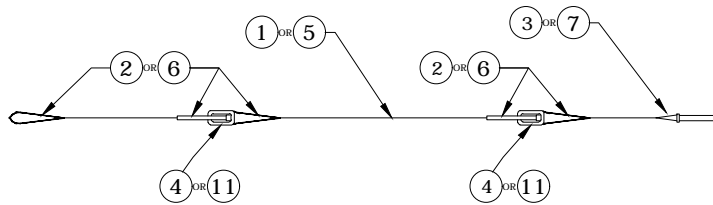
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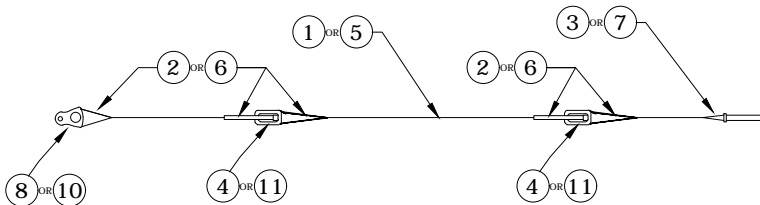
GSG 50
GSG 51



GSG 52
GSG 53



GSG 54
GSG 55



GSG 56
GSG 57

Rev. 1 - Obsoleted GSG60 to GSG63, added GSG54 to GSG57, and corrected drawings and material lists.



CONSTRUCTION STANDARDS

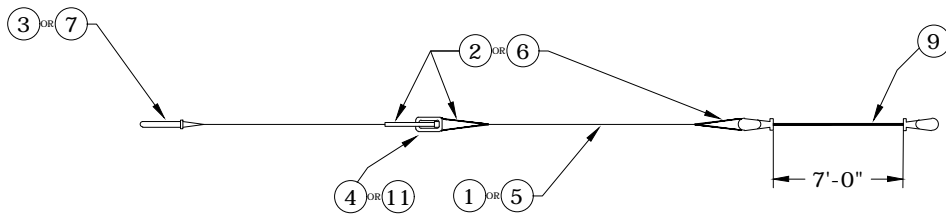
SPAN GUYS

PAGE:
1 of 4

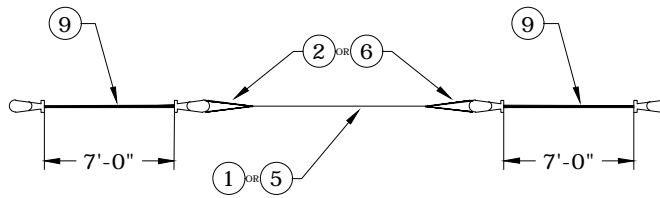
GSG50 - GSG85

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GSG50

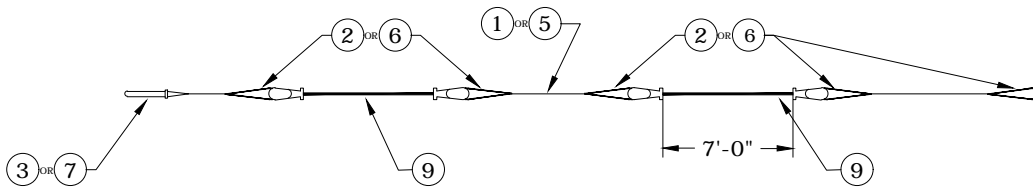
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1	2/24/11	CM	AH
APP: GGW		SECTION	
DATE: 4/1/86		700	



GSG 70
GSG 71



GSG 82
GSG 83



GSG 84
GSG 85

Note:

3' and 10' Fiberglass Strain Insulators must be called for separately:
 S/N 776- 3' Fiberglass Strain Insulator
 S/N 1678- 10' Fiberglass Strain Insulator

Rev. 1 - Obsoleted GSG60 to GSG63, added GSG54 to GSG57, and corrected drawings and material lists.



CONSTRUCTION STANDARDS

SPAN GUYS

PAGE:
2 of 4



GSG50 - GSG85

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GSG50

REVISIONS			
NO.	DATE	ENGR	OPS
1	2/24/11	CM	AH
APP: GGW		SECTION	
DATE: 4/1/86		700	

Rev. 1 - Obsoleted GSG60 to GSG63, added GSG54 to GSG57, and corrected drawings and material lists.

ITEM NO.	DESCRIPTION	GSG50	
		QTY.	S/N
1	Guy Wire, 10M	150ft	1419
2	Guy Grip, 10M, Preformed	6	713
4	Insulator, Guy Strain, Small, 12,000 lbs. Ultimate, ANSI 54-2	2	780
ITEM NO.	DESCRIPTION	GSG51	
		QTY.	S/N
5	Guy Grip, 18M	150ft	1420
6	Guy Grip, 18M, Preformed	6	714
11	Insulator, Guy Strain, Large, 20,000 lbs. Ultimate, ANSI 54-3	2	781
ITEM NO.	DESCRIPTION	GSG52	
		QTY.	S/N
1	Guy Wire, 10M	150ft	1419
2	Guy Grip, 10M, Preformed	6	713
4	Insulator, Guy Strain, Small, 12,000 lbs. Ultimate, ANSI 54-2	2	780
10	Clevis, Thimble, 1 1/4" Diameter	1	1628
ITEM NO.	DESCRIPTION	GSG53	
		QTY.	S/N
5	Guy Grip, 18M	150ft	1420
6	Guy Grip, 18M, Preformed	6	714
8	Clevis, Thimble, 2 1/4" Diameter	1	1912
11	Insulator, Guy Strain, Large, 20,000 lbs. Ultimate, ANSI 54-3	2	781
ITEM NO.	DESCRIPTION	GSG54	
		QTY.	S/N
1	Guy Wire, 10M	150ft	1419
2	Guy Grip, 10M, Preformed	5	713
3	Guy Grip, 10M, Automatic, Long	1	1190
4	Insulator, Guy Strain, Small, 12,000 lbs. Ultimate, ANSI 54-2	2	780
ITEM NO.	DESCRIPTION	GSG55	
		QTY.	S/N
5	Guy Grip, 18M	150ft	1420
6	Guy Grip, 18M, Preformed	5	714
7	Guy Grip, 18M, Automatic, Long	1	1192
11	Insulator, Guy Strain, Large, 20,000 lbs. Ultimate, ANSI 54-3	2	781
ITEM NO.	DESCRIPTION	GSG56	
		QTY.	S/N
1	Guy Wire, 10M	150ft	1419
2	Guy Grip, 10M, Preformed	5	713
3	Guy Grip, 10M, Automatic, Long	1	1190
4	Insulator, Guy Strain, Small, 12,000 lbs. Ultimate, ANSI 54-2	2	780
10	Clevis, Thimble, 1 1/4" Diameter	1	1628
ITEM NO.	DESCRIPTION	GSG57	
		QTY.	S/N
5	Guy Grip, 18M	150ft	1420
6	Guy Grip, 18M, Preformed	5	714
7	Guy Grip, 18M, Automatic, Long	1	1192
8	Clevis, Thimble, 2 1/4" Diameter	1	1912
11	Insulator, Guy Strain, Large, 20,000 lbs. Ultimate, ANSI 54-3	2	781

	<h2>CONSTRUCTION STANDARDS</h2> <p>SPAN GUYS</p>		REVISIONS						
				DATE	ENGR	OPS			
	1	2/24/11	CM	AH					
PAGE: 3 of 4		GSG50 - GSG85		CAD FILE: GSG50		APP: GWG		SECTION 700	
				DATE: 4/1/86					

