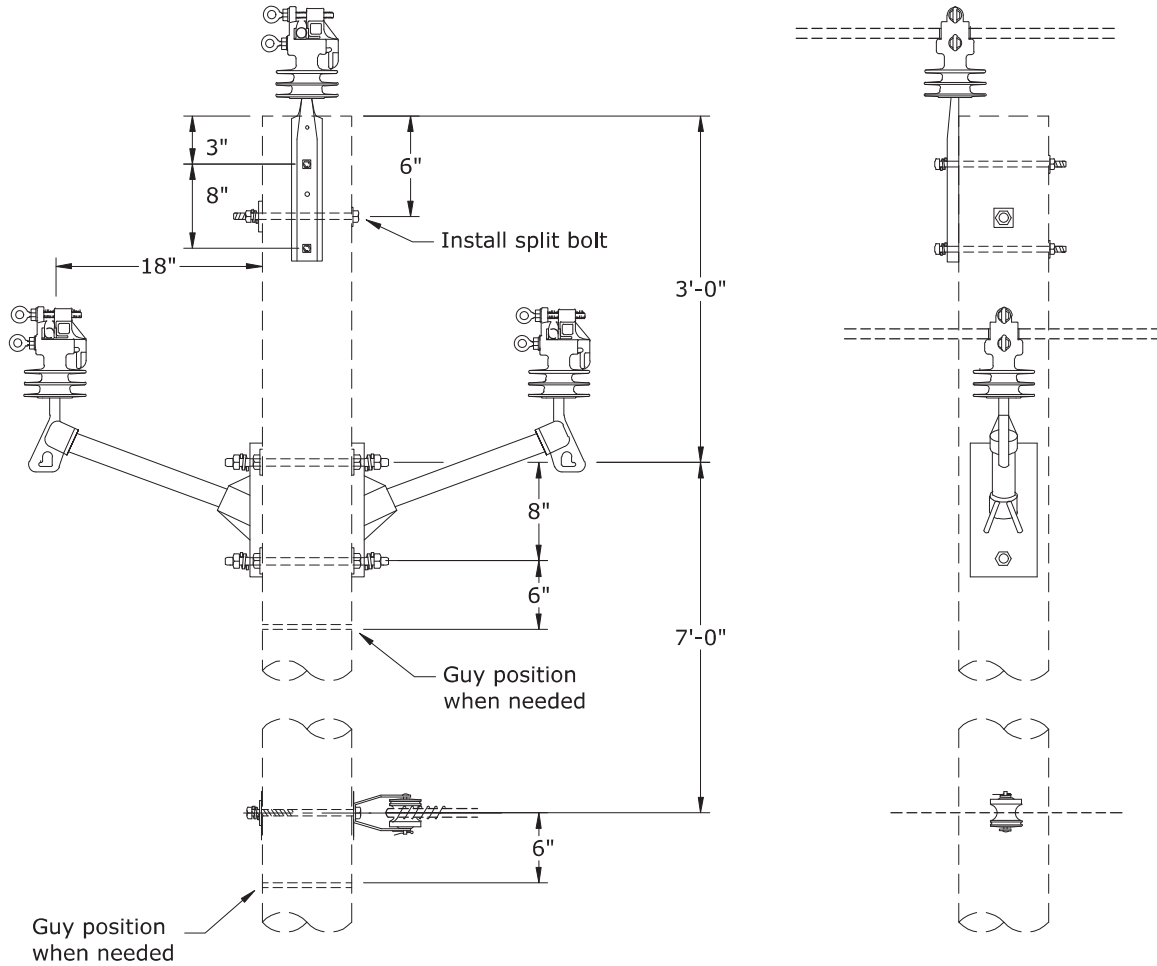


Vise-Top Installation:

- 1st tighten the bottom bolt until ring breaks off
- 2nd tighten the top bolt until ring breaks off
- Remove bolts with socket stick
- Do not reuse bolts after rings have broken off



Notes:

1. Maximum line angle calculated for 3,162 lbs. MWT and 350-ft ruling span.

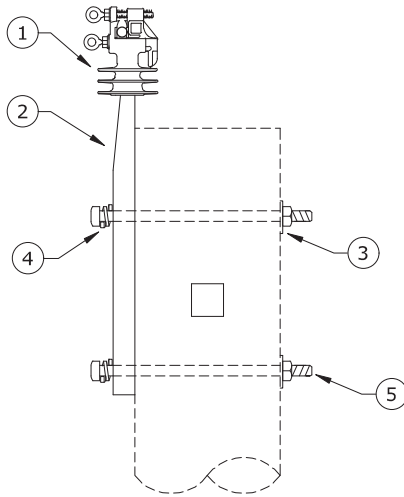


CONSTRUCTION STANDARDS

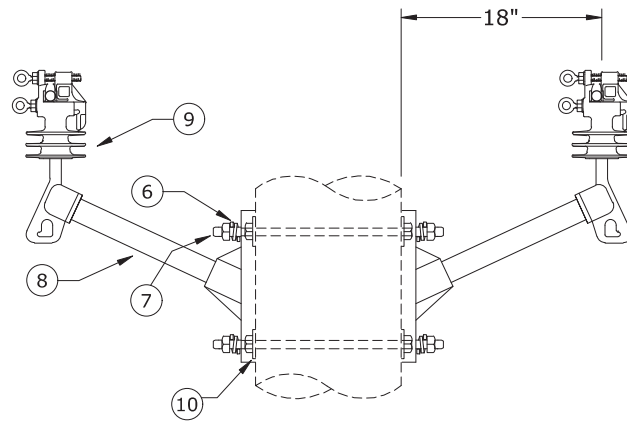
3Ø TWIGGY
0° TO 2°
336 ACSR MAX WIRE

△			
△			

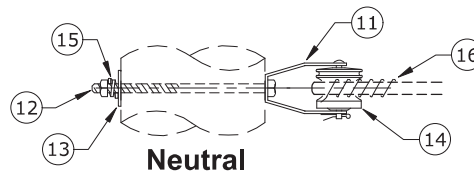
A1.01



A2.04N



N2.1



ITEM NO.	DESCRIPTION	CAL 1
		A1.01
		QTY.
1	Insulator, Vise-Top, Polymer ✱	1
2	Pin, Pole Top ✱	1
3	Washer, Curved, 3" x 3" x 3/8" Thick x 13/16" Hole	2
4	Washer, Lock, Spring, Double Coil, Galv., 5/8" ✱	2
5	Bolt, Machine, 5/8" x 12", Galv., 12,400 lbs Ultimate Tensile ✱	2
ITEM NO.	DESCRIPTION	A2.04N
		QTY.
6	Washer, Lock, Spring, Double Coil, Galv., 5/8"	4
7	Bolt, Double Arm, 5/8" x 18", Galv., 12,400 lbs Ultimate Tensile	2
8	Arm, Epoxy 18" 2500 lbs	2
9	Insulator, Vise-Top, Polymer	2
10	Washer, Flat, Round, Galv., 5/8"	4
ITEM NO.	DESCRIPTION	N2.1
		QTY.
11	Clevis, D.E. Insulator 1340	1
12	Bolt, Machine, 5/8" x 14", Galv., 12,400 lbs Ultimate Tensile	1
13	Washer, Curved, Square, Cast, 3" x 3" x 3/8" Thick x 13/16" Hole	1
14	Insulator, Spool Clevis, ANSI 53-4 Class	1
15	Washer, Lock, Spring, Double Coil, Galv., 5/8"	1
16	Wire, Tie, AL Annealed #4 SD	10

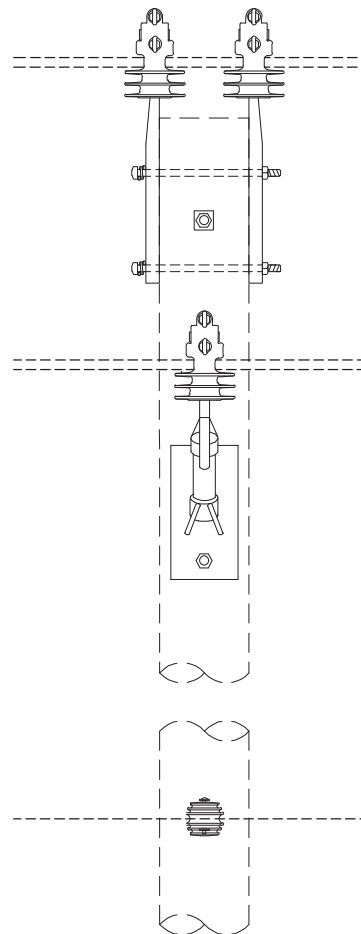
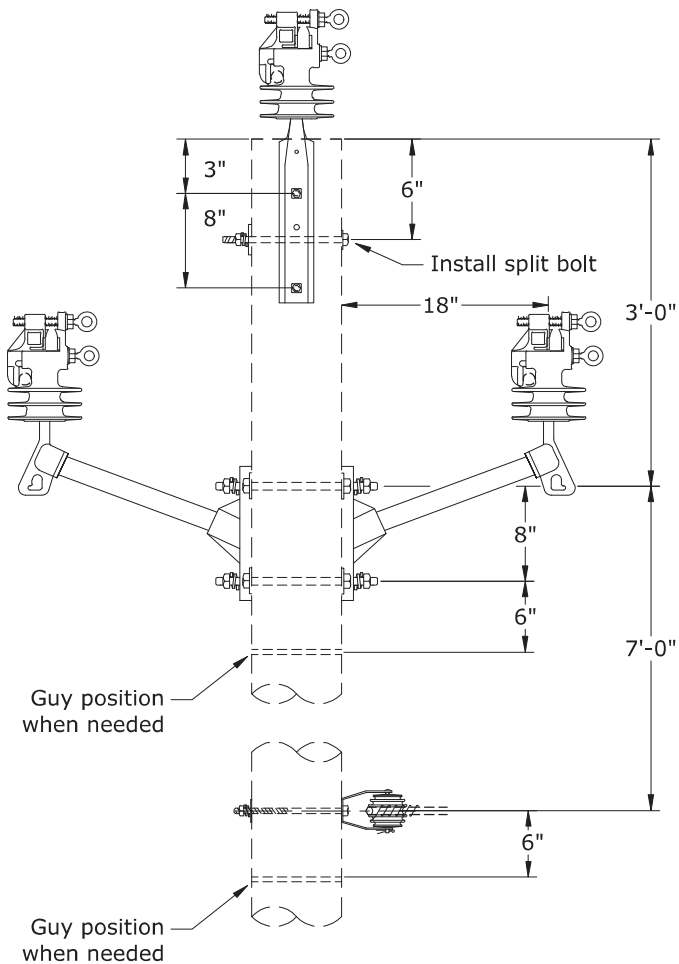


CONSTRUCTION STANDARDS

3Ø TWIGGY
0° TO 2°
336 ACSR MAX WIRE

△			
△			

- 1st tighten the bottom bolt until ring breaks off
- 2nd tighten the top bolt until ring breaks off
- Remove bolts with socket stick
- Do not reuse bolts after rings have broken off



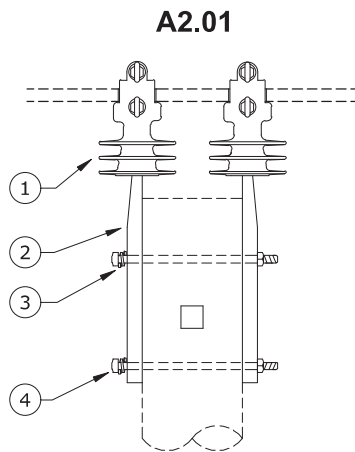
1. Maximum line angle calculated for 5,000 lbs. MWT and 250-ft ruling span.



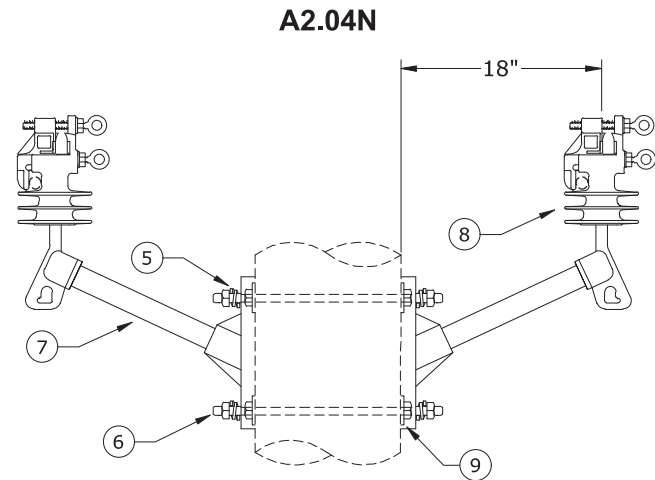
3Ø TWIGGY
2° TO 5°
336 ACSR MAX WIRE

CAL 2

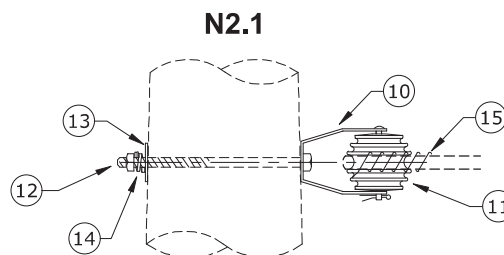
			
			



A2.01



A2.04N

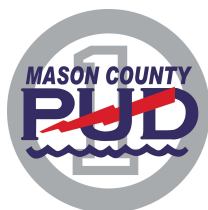


N2.1

Neutral

Rev. 3 - Changed all insulators to vise-top, added avian note, and updated material list.

ITEM NO.	DESCRIPTION	CAL 2
		A2.01 QTY.
1	Insulator, Vise-Top, Polymer ✱	2
2	Pin, Pole Top ✱	2
3	Washer, Lock, Spring, Double Coil, Galv., 5/8" ✱	2
4	Bolt, Machine, 5/8" x 14", Galv., 12,400 lbs Ultimate Tensile ✱	2
ITEM NO.	DESCRIPTION	A2.04N QTY.
5	Washer, Lock, Spring, Double Coil, Galv., 5/8"	4
6	Bolt, Double Arm, 5/8" x 18", Galv., 12,400 lbs Ultimate Tensile	2
7	Arm, Epoxy 18" 2500 lb	2
8	Insulator, Vise-Top, Polymer	2
9	Washer, Flat, Round, Galv., 5/8"	4
ITEM NO.	DESCRIPTION	N2.1 QTY.
10	Clevis, DE Insulator	1
11	Insulator, Spool, Clevis, ANSI 53-4 Class	1
12	Bolt, Machine, 5/8" x 14", Galv., 12,400 lbs Ultimate Tensile ✱	1
13	Washer, Curved, Square, Cast, 3" x 3" x 3/8" Thick x 13/16" Hole	1
14	Washer, Lock, Spring, Double Coil, Galv., 5/8" ✱	1
15	Wire, Tie, AL Annealed #4 SD	10



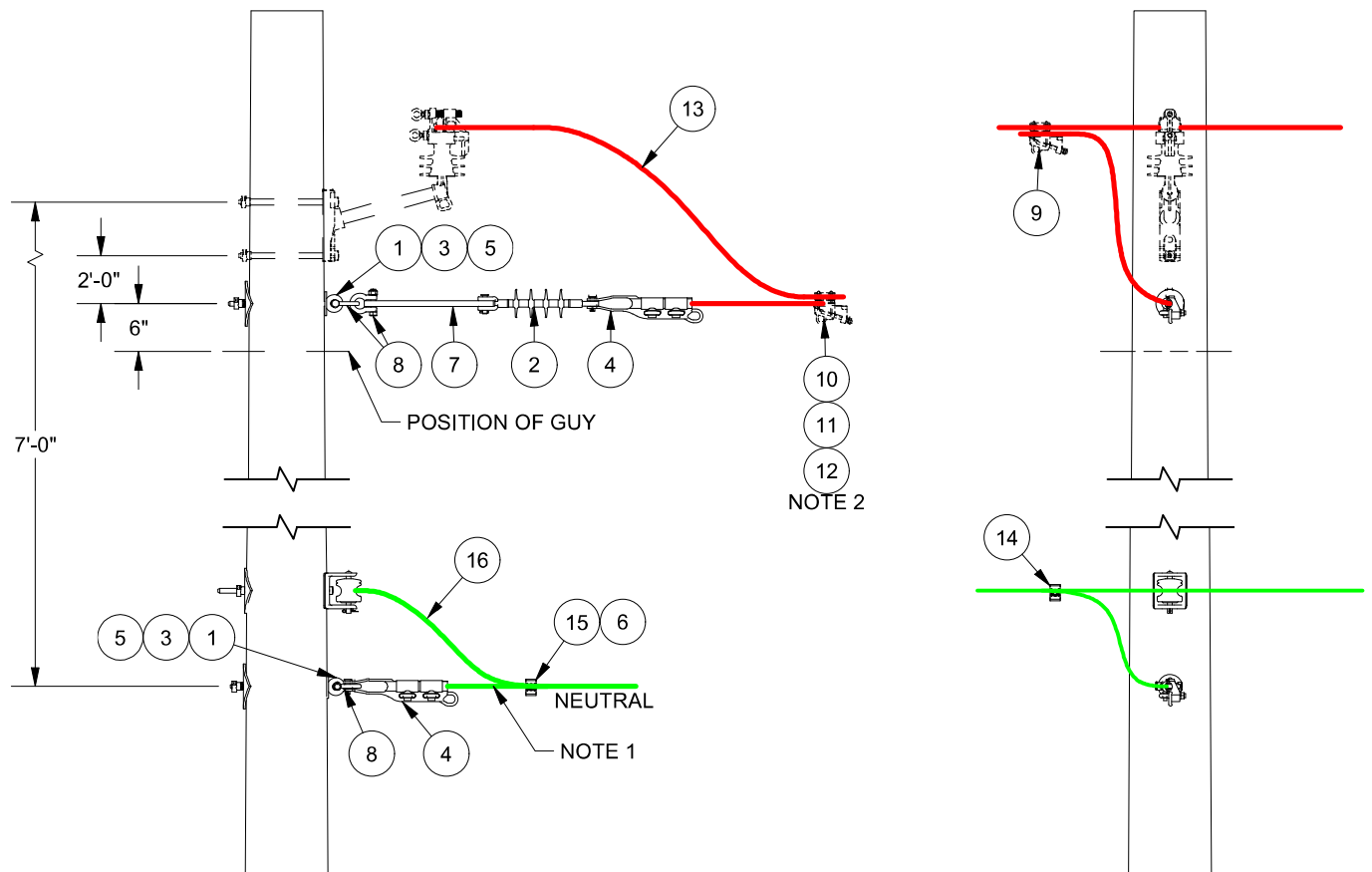
CONSTRUCTION STANDARDS

3Ø TWIGGY
2° TO 5°
336 ACSR MAX WIRE

△			
△			

LIST OF MATERIALS FOR A5.3NG

REF.	QTY.	DESCRIPTION	MANUFACTURER	PART NO.
1	3	WASHER, SQ CURVE 3" X 3" X 1/4", 11/16" HOLE, GALV	HUGHES BROTHERS	SCW3-60
2	1	INSULATOR, SUSPENSION 15kV CLEVIS TONGUE, POLYMER	HENDRIX	DS-15M
3	2	BOLT, OVAL EYE 5/8X16 IN.	MACLEAN POWER	J9416
4	2	DEAD END, STRAIN BOLTED 3/0-556	MACLEAN POWER	ASO-858-2-N
5	2	WASHER, DB COIL SPRING LOCK, 11/16" HOLE	HUGHES BROTHERS	SLW2-60
6	0	CONNECTOR, WEDGE, .568-.364 RUN, .162-.204 TAP	BURNDY	WCB15
7	1	LINK, EXTENSION, 12 INCH	MACLEAN POWER	CEL12
8	3	ANCHOR SHACKLE, 1/2 IN, 20KIP	MACLEAN POWER	ASH-45
9	1	CONNECTOR, WEDGE TAP, 336.4-300MCM	CPI	350124
10	0	CONNECTOR, WEDGE, .609-.684 RUN, .232-.257 TAP	CPI	350119
11	0	BOLTED WEDGE HOTLINE TAP CONNECTOR, .414-.858 RUN, .128 TAP	BURNDY	HTC200
12	0	CONNECTOR, WEDGE, .609-.684 RUN, .162-.232 TAP	CPI	350117
13	10	CONDUCTOR, BARE 300MCM 19 STD CU	GENERIC	---
14	1	CONNECTOR, WEDGE TAP, 4/0-4/0	CPI	264115
15	0	CONNECTON, WEDGE, .502-.574 RUN, .250-.328 TAP	CPI	264112
16	10	CONDUCTOR, BARE, 4/0 ACSR (Penguin)	GENERIC	---

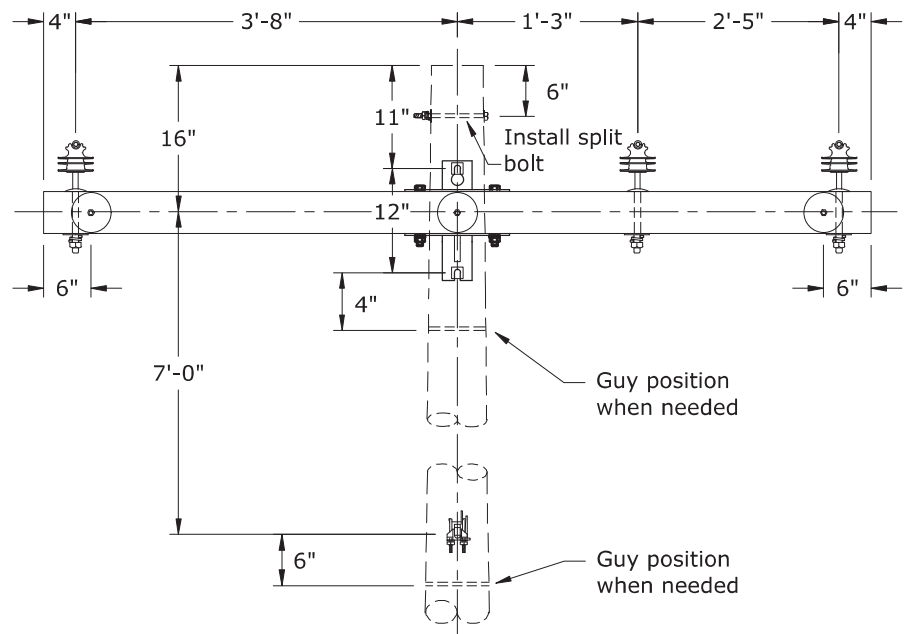


NOTES:

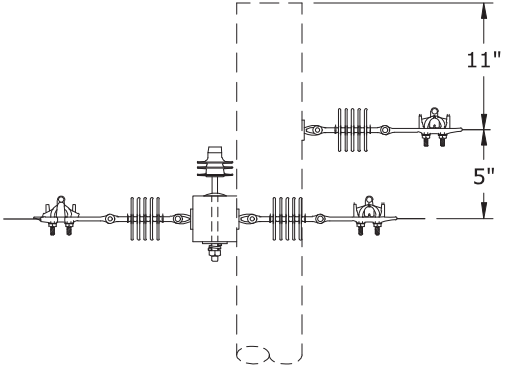
1. TAP DIRECTLY FROM MAIN LINE NEUTRAL.
2. CLAMP ONTO TAP BASED ON TAP CONDUCTOR SIZING.

DATE	REVISION	#	1550 E REPUBLIC RD SPRINGFIELD, MO 65804 Ph: 417-888-0645 Fax: 417-888-0657 www.tothassociates.com CERTIFICATE OF AUTHORITY: WA# 604 082 498 © 2026 Toth and Associates, Inc.	DWN. BY: DBJ	PROJECT:	ELDON-DUCKABUSH RECONDUCTOR
09/04/2026	ISSUED FOR BID	A		CAD. BY: EAN	LOCATION:	
				APPD. BY: WFW	CLIENT:	MASON COUNTY PUD 1 SHELTON, WASHINGTON
				DATE: 08/10/2026		
				TITLE:	A5.3NG (WD)	SHEET NO.
					TAP GUIDE 1 PHASE PRIMARY ASSEMBLY	EDR.D04.03

FRONT VIEW



SIDE VIEW

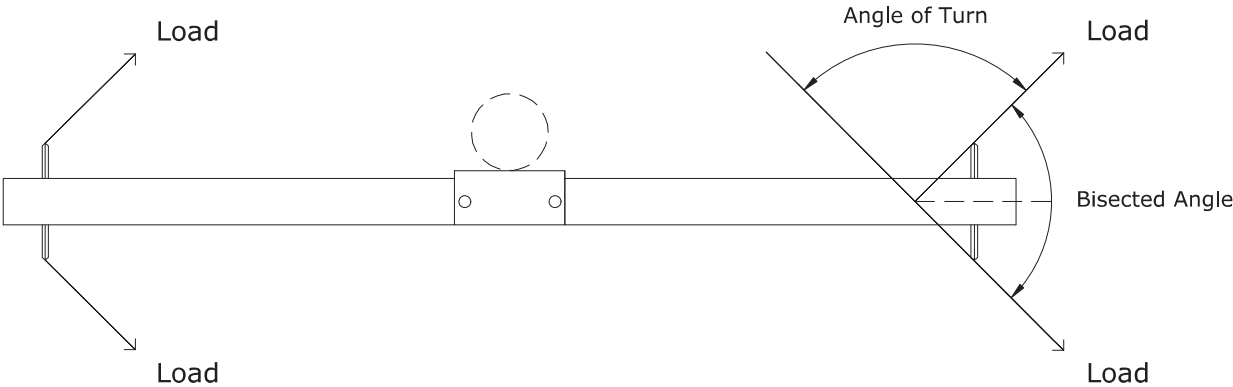


CONSTRUCTION STANDARDS 8' PRE-ASSEMBLED DOUBLE DEADEND 336 ACSR MAX WIRE

REVISIONS

△	DATE	ENGR	OPS
△			

DEADEND FOR ANGLED SPANS



- Notes:
- 1. Maximum angle with 336 is 60°, limited by the 3/4" machine bolt.
 - 2. Angle must be bisected so that each eye-nut has half the angle.



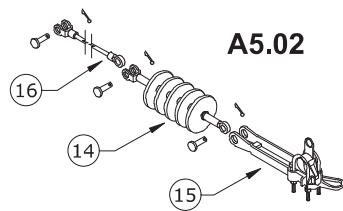
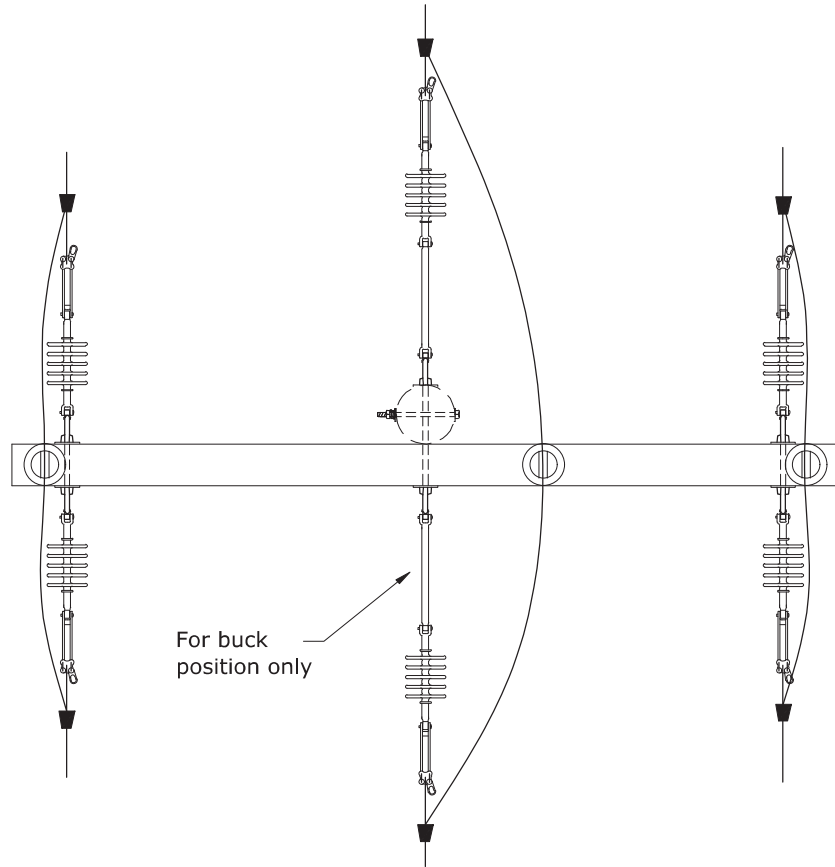
CONSTRUCTION STANDARDS
8' PRE-ASSEMBLED DOUBLE DEADEND
336 ACSR MAX WIRE

PAGE:
2 of 4

C6.21F

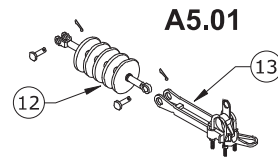
REVISIONS			
	DATE	ENGR	OPS
			

TOP VIEW



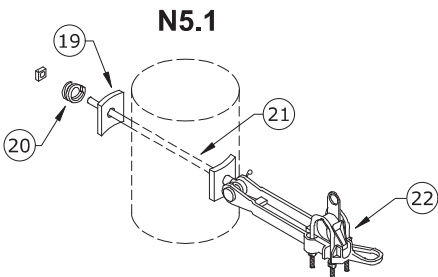
A5.02

Center Phase



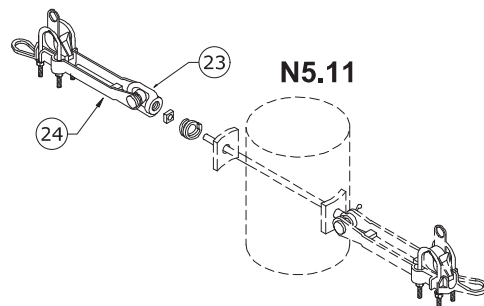
A5.01

Road & Field Phases



N5.1

Neutral



N5.11

Neutral



CONSTRUCTION STANDARDS

8' PRE-ASSEMBLED DOUBLE DEADEND
336 ACSR MAX WIRE

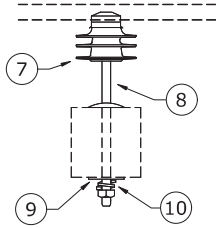
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3 of 4

6.21F

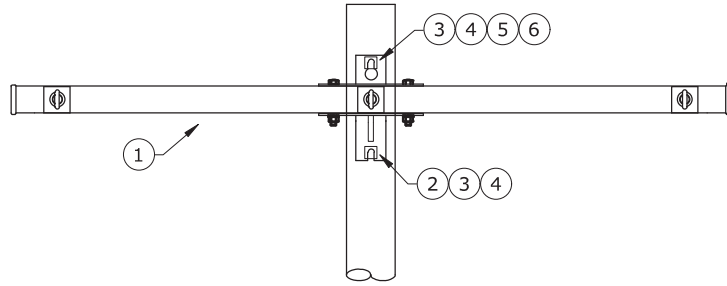
REVISIONS

△	DATE	ENGR	OPS
△			

A1.011



W2.8DEF



Front View

Rev. 4 - Eliminated porcelain pin insulators and added avian notes.

ITEM NO.	DESCRIPTION	C6.21F	
		W2.8DEF	
		QTY.	
1	Arm, Deadend Assembly, 8', 3-position, 336 Max	1	
2	Bolt, Machine, 3/4" x 14", Galv., 18,350 lbs Ultimate Tensile	1	
3	Washer, Lock, Spring, Double Coil, Galv., 3/4"	2	
4	Washer, Curved, Square, Cast, 3" x 3" x 3/8" Thick x 13/16" Hole	2	
5	Nut, Eye Oval 3/4"	1	
6	Bolt, Machine, 3/4" x 16", Galv., 18,350 lbs Ultimate Tensile	1	
ITEM NO.	DESCRIPTION	A1.011 (3)	
		QTY.	
7	Insulator, Vise-Top, Polymer	3	
8	Pin, Crossarm	3	
9	Washer, Square, Flat, 5/8", 2 1/4" x 2 1/4"	3	
10	Washer, Lock, Spring, Double Coil, Galv., 5/8"	3	
ITEM NO.	DESCRIPTION	A5.01 (4)	
		QTY.	
12	Insulator, Suspension, 15 kV Clevis-Tongue, Polymer Type	4	
13	Clamp, Strain, Distribution, #4 - 336	4	
ITEM NO.	DESCRIPTION	A5.02 (2)	
		QTY.	
14	Insulator, Suspension, 15 kV Clevis-Tongue, Polymer Type	2	
15	Clamp, Strain, Distribution, #4 - 336	2	
16	Insulator, Guy Strain, Fiberglass 20"	2	
ITEM NO.	DESCRIPTION	Additional Material	
		QTY.	
17	Connector, Tap, Wedge, 336 to 336	6	
18	Connector, Tap, Wedge, 4/0 to 4/0	2	
ITEM NO.	DESCRIPTION	N5.1	
		QTY.	
19	Washer, Curved, Square, Cast, 3" x 3" x 3/8" Thick x 13/16" Hole	2	
20	Washer, Lock, Spring, Double Coil, Galv., 5/8"	1	
21	Bolt, Eye, 5/8" x 14", Galv., 12,400 lbs Ultimate Tensile	1	
22	Clamp, Strain, Distribution, #4 - 336	1	
ITEM NO.	DESCRIPTION	N5.11	
		QTY.	
23	Nut, Eye Oval 5/8"	1	
24	Clamp, Strain, Distribution, #4 - 336	1	



CONSTRUCTION STANDARDS

8' PRE-ASSEMBLED DOUBLE DEADEND
336 ACSR MAX WIRE

PAGE:
4 of 4

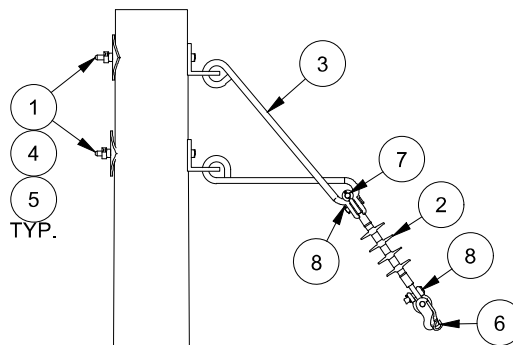
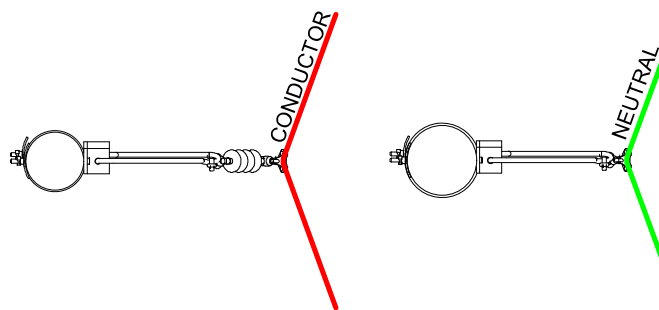
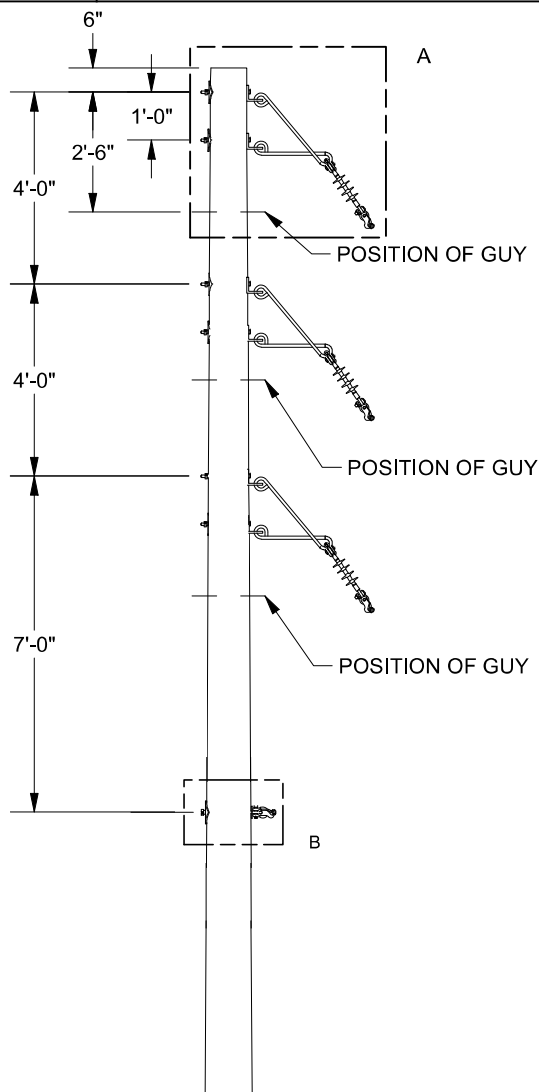
C6.21F

REVISIONS

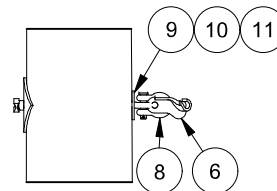
DATE	ENGR	OPS

LIST OF MATERIALS FOR C3.1L

REF.	QTY.	DESCRIPTION	MANUFACTURER	PART NO.
1	6	WASHER, SQ CURVE 3" X 3" X 1/4", 13/16" HOLE, GALV	HUGHES BROTHERS	SCW3-70
2	3	INSULATOR, SUSPENSION 15KV CLEVIS TONGUE, POLYMER	HENDRIX	DS-15M
3	3	SWINGING ANGLE BRACKET, 1', 5 KIPS	HUGHES BROTHERS	2846.7
4	6	BOLT, MACHINE 3/4" X 16", SQ HEAD, W/ NUT, GALV	HUGHES BROTHERS	B716-6
5	6	WASHER, DB COIL SPRING LOCK, 13/16" HOLE	HUGHES BROTHERS	SLW2-70
6	4	SUSPENSION, ANGLE, .23-.75	MACLEAN POWER	ALS-1-N
7	3	ANCHOR SHACKLE, 3/4 IN, 50 KIP	MACLEAN POWER	ASH-66A
8	7	ANCHOR SHACKLE, 1/2 IN, 20KIP	MACLEAN POWER	ASH-45
9	1	BOLT, OVAL EYE 5/8X16 IN.	MACLEAN POWER	J9416
10	1	WASHER, SQ CURVE 3" X 3" X 1/4", 11/16" HOLE, GALV	HUGHES BROTHERS	SCW3-60
11	1	WASHER, DB COIL SPRING LOCK, 11/16" HOLE	HUGHES BROTHERS	SLW2-60



DETAIL A



DETAIL B

NOTES:

1. IF MOUNTING A5.3NG OR G1.4 USE MS3.1 AS REQUIRED TO MAINTAIN CLEARANCE TO STRUCTURE.

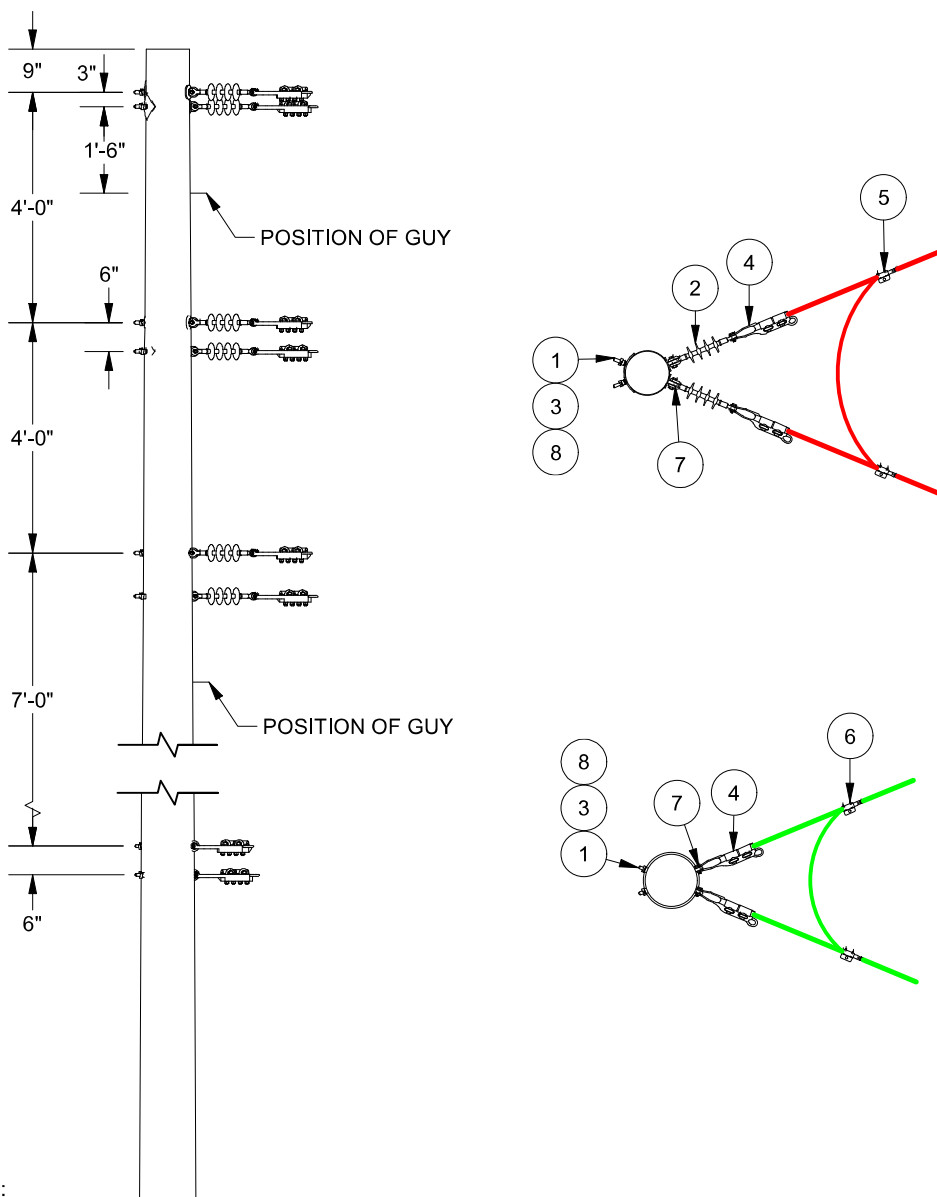
DATE	REVISION	#	 1550 E REPUBLIC RD SPRINGFIELD, MO 65804 Ph: 417-888-0645 Fax: 417-888-0657 www.tothassociates.com CERTIFICATE OF AUTHORITY: WA# 604 082 498 © 2026 Toth and Associates, Inc.	DWN. BY: DBJ	PROJECT: ELDON-DUCKABUSH RECONDUCTOR	
09/04/2026	ISSUED FOR BID	A		CKD. BY: EAN		
				APPD. BY: WFW	CLIENT: MASON COUNTY PUD 1 SHELTON, WASHINGTON	
				DATE: 08/12/2026		
				TITLE:	C3.1L SUSPENSION ANGLE (LARGE CONDUCTOR) 3 PHASE PRIMARY ASSEMBLY	SHEET NO. EDR.D04.05



DATE	REVISION	#	 1550 E REPUBLIC RD SPRINGFIELD, MO 65804 Ph: 417-888-0645 Fax: 417-888-0657 www.tothassociates.com CERTIFICATE OF AUTHORITY: WA# 604 082 498 © 2026 Toth and Associates, Inc.	DWN. BY: DBJ	PROJECT: ELDON-DUCKABUSH RECONDUCTOR	SHEET NO. EDR.D04.06
09/04/2026	ISSUED FOR BID	A		CKD. BY: EAN		
				APPD. BY: WFW	CLIENT: MASON COUNTY PUD 1 SHELTON, WASHINGTON	
				DATE: 08/12/2026		
				TITLE: C3.1 SUSPENSION ANGLE 3 PHASE PRIMARY ASSEMBLY		

LIST OF MATERIALS FOR C4.1G

REF.	QTY.	DESCRIPTION	MANUFACTURER	PART NO.
1	8	WASHER, SQ CURVE 3" X 3" X 1/4", 11/16" HOLE, GALV	HUGHES BROTHERS	SCW3-60
2	6	INSULATOR, SUSPENSION 15kV CLEVIS TONGUE, POLYMER	HENDRIX	DS-15M
3	8	BOLT, OVAL EYE 5/8X16 IN.	MACLEAN POWER	J9416
4	8	DEAD END, STRAIN BOLTED 3/0-556	MACLEAN POWER	ASO-858-2-N
5	6	CONNECTOR, WEDGE TAP, 336.4-336.4	CPI	350125
6	2	CONNECTOR, WEDGE TAP, 4/0-4/0	CPI	264115
7	8	ANCHOR SHACKLE, 1/2 IN, 20KIP	MACLEAN POWER	ASH-45
8	8	WASHER, DB COIL SPRING LOCK, 11/16" HOLE	HUGHES BROTHERS	SLW2-60

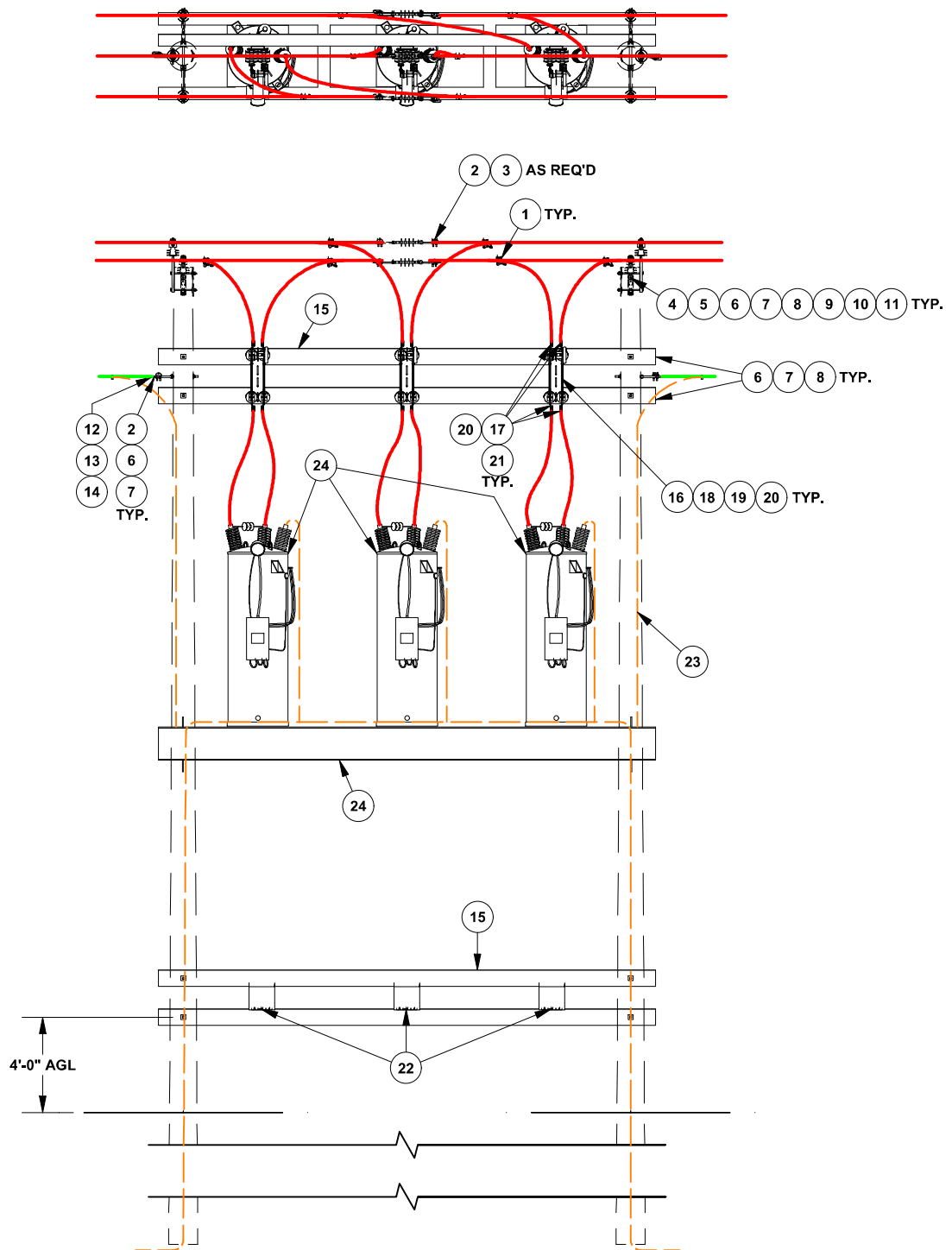


NOTES:

1. SEE H1.1 FOR GROUNDING ASSEMBLY.

2. IF MOUNTING A5.3NG OR G1.4 USE MS4.1 AS REQUIRED TO MAINTAIN CLEARANCE TO STRUCTURE.

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09/04/2026	ISSUED FOR BID	A			CAD. BY: EAN	LOCATION: MASON AND JEFFERSON COUNTIES, WA
					APPD. BY: WFW	CLIENT: MASON COUNTY PUD 1 SHELTON, WASHINGTON
					DATE: 08/12/2026	
					TITLE: C4.1G	
					DEADEND 3 PHASE PRIMARY ASSEMBLY	SHEET NO. EDR.D04.07

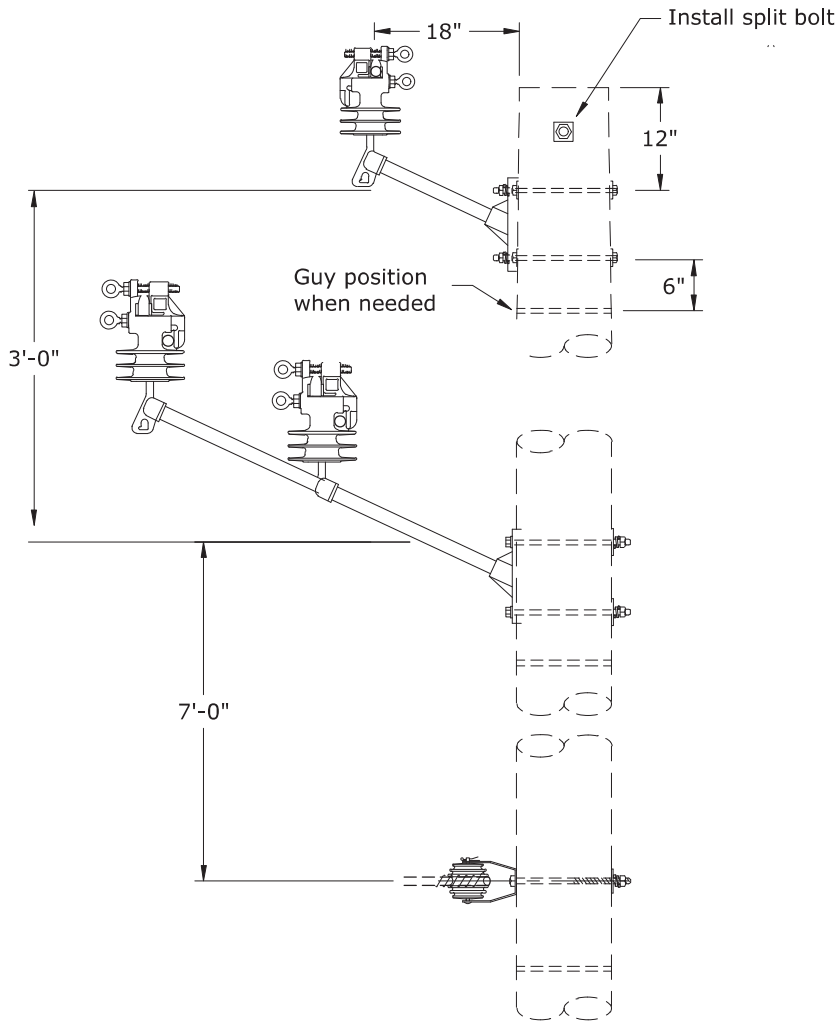


DATE	REVISION	#	 TOOTH & ASSOCIATES 1550 E REPUBLIC RD SPRINGFIELD, MO 65804 Ph: 417-888-0645 Fax: 417-888-0657 www.tothassociates.com CERTIFICATE OF AUTHORITY: WA# 604 082 498 © 2026 Toth and Associates, Inc.	DWN. BY: DBJ	PROJECT:	ELDON-DUCKABUSH RECONDUCTOR	
09/04/2026	ISSUED FOR BID	A		CRD. BY: EAN	LOCATION:	MASON AND JEFFERSON COUNTIES, WA	
				APPD. BY: WFW	CLIENT:	MASON COUNTY PUD 1 SHELTON, WASHINGTON	
				DATE: 08/13/2026			
				TITLE:	Y1.3 VOLTAGE REGULATORS, PLATFORM MOUNTED, 3 SINGLE PHASE		SHEET NO. EDR.D04.08

LIST OF MATERIALS FOR Y1.3

REF.	QTY.	DESCRIPTION	MANUFACTURER	PART NO.
1	6	CONNECTOR, WEDGE TAP, 336.4-300MCM	CPI	350124
2	8	DEAD END, STRAIN BOLTED 3/0-556	MACLEAN POWER	ASO-858-2-N
3	3	INSULATOR, SUSPENSION 15KV CLEVIS TONGUE, POLYMER	HENDRIX	DS-15M
4	6	INSULATOR, POLY, VISE TOP, 15KV	HENDRIX	HPI-15VTP-01
5	2	PIN, POLE TOP STEEL 20 IN	MACLEAN POWER	J740Z
6	16	WASHER, SQ CURVE 3" X 3" X 1/4", 11/16" HOLE, GALV	HUGHES BROTHERS	SCW3-60
7	20	WASHER, DB COIL SPRING LOCK, 11/16" HOLE	HUGHES BROTHERS	SLW2-60
8	14	BOLT, MACHINE 5/8" X 16", SQ HEAD, W/ NUT, GALV	HUGHES BROTHERS	B616-6
9	4	BOLT, DOUBLE ARMING 5/8X18 IN.	MACLEAN POWER	J8868
10	4	ARM, EPOXY 18" 2000 LBS	ALUMAFORM	F1CS-MV-A18-BVP-1
11	12	WASHER, ROUND 2" X 1/4", 11/16" HOLE	HUGHES BROTHERS	RW2-60
12	2	BOLT, OVAL EYE 5/8X16 IN.	MACLEAN POWER	J9416
13	2	ANCHOR SHACKLE, 1/2 IN, 20KIP	MACLEAN POWER	ASH-45
14	2	CONN. CU,AL, 4/0 RUN, #4 TAP	BURNDY	YHD250
15	4	CROSSARM, 23', 3-5/8" x 4-5/8"	BROOKS	23', 3-5/8" x 4-5/8"
16	3	SWITCH, OH REG. BYPASS DISCONNECT, 15KV	HUBBELL	BPRD061
17	12	COMPRESSION, 2 HOLE, 300KCMIL CU	BURNDY	YAZ322NTCFX
18	6	BOLT, MACHINE 1/2X10 IN.	CHANCE	8710
19	30	WASHER, DB COIL SPRING LOCK, 9/16" HOLE	CHANCE	C2050185
20	30	WASHER, ROUND 1-3/8", 9/16" HOLE	CHANCE	PS6803TDG
21	24	BOLT, ASSEMBLY S.S 1/2X2	MT. HOOD	BAS88.050C0200
22	0	EXISTING REGULATOR AND CONTROLS, TRANSFER	---	---
23	0	REGULATOR, CONTROL CABLE, COOPER CL-7	---	5041489B0360
24	1	RACK, REGULATOR	ALUMAFORM	HD2PCAL-14
25	30	CONDUCTOR, BARE 300MCM 19 STD CU	GENERIC	---

DATE	REVISION	#	 TOOTH & ASSOCIATES 1550 E REPUBLIC RD SPRINGFIELD, MO 65804 Ph: 417-888-0645 Fax: 417-888-0657 www.tothassociates.com CERTIFICATE OF AUTHORITY: WA# 604 082 498 © 2026 Toth and Associates, Inc.	DWN. BY:	PROJECT:	ELDON-DUCKABUSH RECONDUCTOR
08/17/2026	ISSUED FOR 60% REVIEW	A		DBJ		
				CRD. BY:	LOCATION:	MASON AND JEFFERSON COUNTIES, WA
				EAN	CLIENT:	MASON COUNTY PUD 1 SHELTON, WASHINGTON
				APPD. BY:		
				WFW		
			DATE:	TITLE:	Y1.3	SHEET NO.
			08/13/2026	VOLTAGE REGULATORS, PLATFORM MOUNTED, 3 SINGLE PHASE		EDR.D04.09



Vise-Top Installation:

- 1st tighten the bottom bolt until ring breaks off
- 2nd tighten the top bolt until ring breaks off
- Remove bolts with socket stick
- Do not reuse bolts after rings have broken off

Notes: 1. Maximum line angle calculated for 3,162 lbs. MWT and 350-ft ruling span.



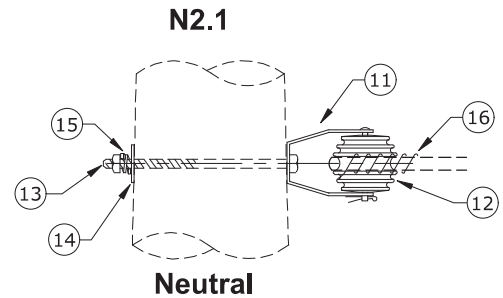
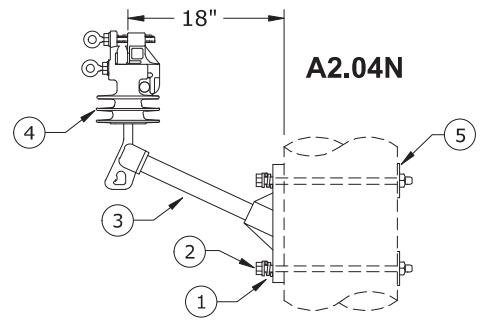
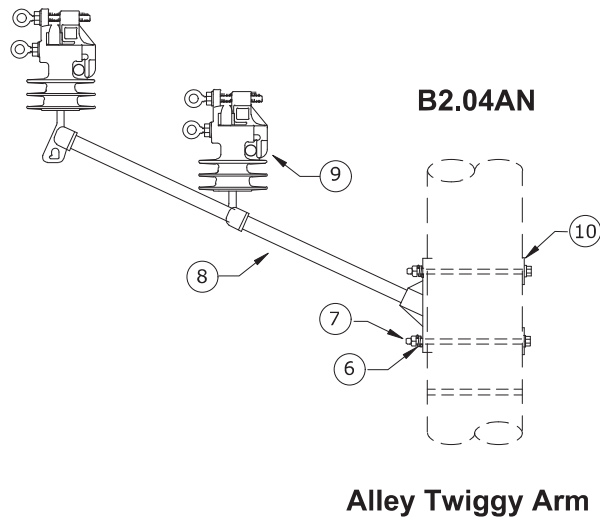
CONSTRUCTION STANDARDS

3Ø ALLEY TWIGGY
6° TO 30°
336 ACSR MAX WIRE

PAGE:
1 of 2

CAL 6

△			
△			



ITEM NO.	DESCRIPTION	CAL 6
		A2.04N QTY.
1	Washer, Lock, Spring, Double Coil, Galv., 5/8"	2
2	Bolt, Machine, 5/8" x 16", Galv., 12,400 lbs Ultimate Tensile	2
3	Arm, Epoxy 18" 2500 lbs	1
4	Insulator, Vise-Top, Polymer	1
5	Washer, Curved, Square, Cast, 3" x 3" x 3/8" Thick x 13/16" Hole	2
ITEM NO.	DESCRIPTION	B2.04AN
		QTY.
6	Washer, Lock, Spring, Double Coil, Galv., 5/8"	2
7	Bolt, Machine, 5/8" x 16", Galv., 12,400 lbs Ultimate Tensile	2
8	Arm, Epoxy 38" to 42" , 2-position	1
9	Insulator, Vise-Top, Polymer	2
10	Washer, Curved, Square, Cast, 3" x 3" x 3/8" Thick x 13/16" Hole	2
ITEM NO.	DESCRIPTION	N2.1
		QTY.
11	Clevis, DE Insulator	1
12	Insulator, Spool, Clevis, ANSI 53-4 Class	1
13	Bolt, Machine, 5/8" x 14", Galv., 12,400 lbs Ultimate Tensile *	1
14	Washer, Curved, Square, Cast, 3" x 3" x 3/8" Thick x 13/16" Hole	1
15	Washer, Lock, Spring, Double Coil, Galv., 5/8" *	1
16	Wire, Tie, AL Annealed #4 SD	10



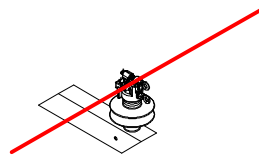
CONSTRUCTION STANDARDS

3Ø ALLEY TWIGGY
6° TO 30°
336 ACSR MAX WIRE

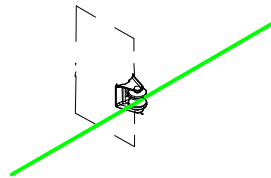
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LIST OF MATERIALS FOR C1.13F

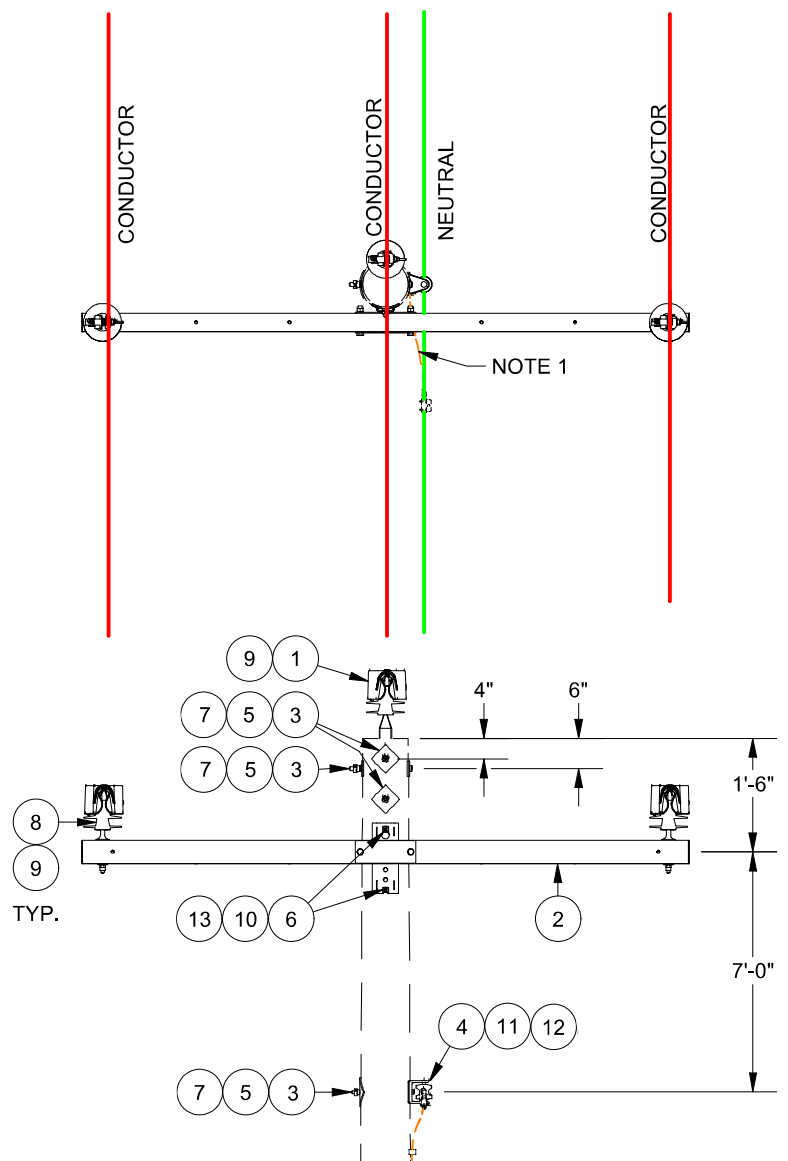
REF.	QTY.	DESCRIPTION	MANUFACTURER	PART NO.
1	1	PIN, POLE TOP STEEL 20 IN	MACLEAN POWER	J740Z
2	1	CROSSARM, 8 FOOT, TANGENT, 3000 SERIES	PUPI	TB30009604X2
3	4	BOLT, MACHINE 5/8" X 16", SQ HEAD, W/ NUT, GALV	HUGHES BROTHERS	B616-6
4	1	ANGLE BRACKET, CLEVIS	MACLEAN POWER	J1300
5	5	WASHER, SQ CURVE 3" X 3" X 1/4", 11/16" HOLE, GALV	HUGHES BROTHERS	SCW3-60
6	2	BOLT, MACHINE 3/4" X 16", SQ HEAD, W/ NUT, GALV	HUGHES BROTHERS	B716-6
7	4	WASHER, DB COIL SPRING LOCK, 11/16" HOLE	HUGHES BROTHERS	SLW2-60
8	2	PIN, LONG SHANK, 6", 1" THREAD, 3/4" SHANK	HUBBELL	4705P
9	3	INSULATOR, POLY, VISE TOP, 15KV	HENDRIX	HPI-15VTP-01
10	2	WASHER, SQ CURVE 3" X 3" X 1/4", 13/16" HOLE, GALV	HUGHES BROTHERS	SCW3-70
11	1	INSULATOR, SPOOL CLEVIS, ANSI 53-4 CLASS	HENDRIX	HPI-53-2
12	1	WIRE TIE, 4/0 ACSR, SPOOL INSULATOR TYPE	HUBBELL	LRO4024AS
13	2	WASHER, DB COIL SPRING LOCK, 13/16" HOLE	HUGHES BROTHERS	SLW2-70



CONDUCTOR



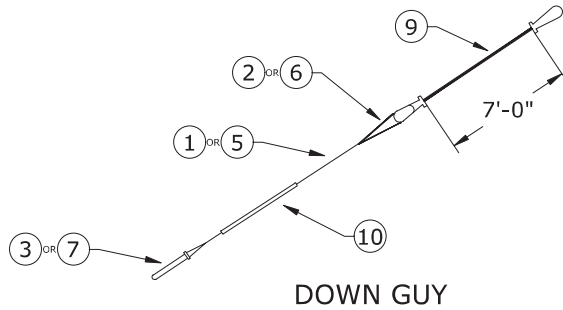
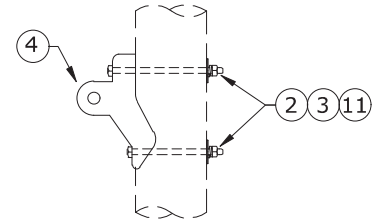
NEUTRAL

**NOTE:**

1. REFER TO H1.1 FOR POLE GROUNDING ASSEMBLY. NEUTRAL TO BE GROUNDED EVERY 4TH TANGENT STRUCTURE.

DATE	REVISION	#	 1550 E REPUBLIC RD SPRINGFIELD, MO 65804 Ph: 417-888-0645 Fax: 417-888-0657 www.tothassociates.com CERTIFICATE OF AUTHORITY: WA# 604082 498 © 2026 Toth and Associates, Inc.	DWN. BY: DBJ	PROJECT: ELDON-DUCKABUSH RECONDUCTOR		
09/04/2026	ISSUED FOR BID	A		CKD. BY: EAN	LOCATION: MASON AND JERRERSON COUNTIES, WA		
				APPD. BY: WFW	CLIENT: MASON COUNTY PUD 1 SHELTON, WASHINGTON		
				DATE: 08/10/2026			
					TITLE: CF1.13 (WD)		
					TANGENT 3 PHASE PRIMARY ASSEMBLY		
					SHEET NO. EDR.D04.10		

GUY ATTACHMENT



Notes:

1. If more than one guy will be attached to one anchor, an additional long automatic guy grip must be used.

ITEM NO.	DESCRIPTION	GUY ATTACH	
		QTY.	
2	Machine Bolt, 3/4" x 14", 18,350 lbs. Ultimate Tensile	2	
3	Curved Washer, Cast, 4" x 4"	2	
4	Pole Eye Plate, 21,000 lbs. Ultimate Tensile	1	
11	Double Coil Spring Lock Washer 3/4"	2	

ITEM NO.	DESCRIPTION	DOWN GUY	
		QTY.	
5	Guy Wire, 18M	45ft	
6	Guy Grip, 18M, Preformed	1	
7	Guy Grip, 18M, Automatic, Short	1	
9	Insulator, Fiberglass, 2 Wheel, 7', 21,000 lbs. Ultimate, 530kV Wet Flashover	1	
10	Marker, Guy 8' Yellow	1	



CONSTRUCTION STANDARDS

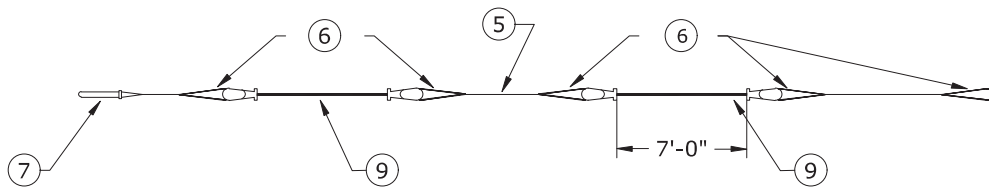
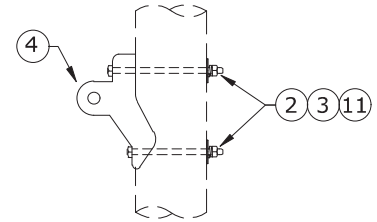
DOWN GUY

PAGE:
1 of 1

E1.1

DATE		

GUY ATTACHMENT



SPAN GUY

ITEM NO.	DESCRIPTION	GUY ATTACH
		QTY.
2	Machine Bolt, 3/4" x 14", 18,350 lbs. Ultimate Tensile	4
3	Curved Washer, Cast, 4" x 4"	4
4	Pole Eye Plate, 21,000 lbs. Ultimate Tensile	2
11	Double Coil Spring Lock Washer 3/4"	4

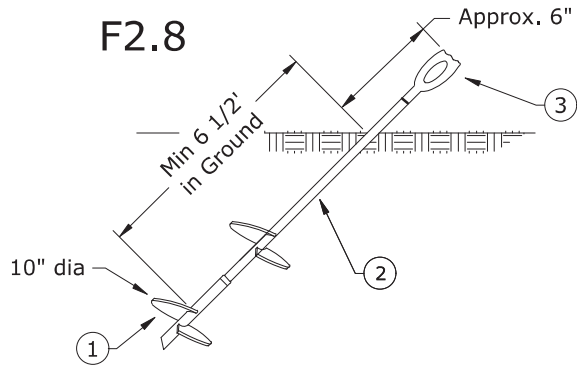
ITEM NO.	DESCRIPTION	SPAN GUY
		QTY.
5	Guy Grip, 18M	150ft
6	Guy Grip, 18M, Preformed	5
7	Guy Grip, 18M, Automatic, Long	1
9	Insulator, Fiberglass, 2 Wheel, 7', 21,000 lbs. Ultimate, 530kV Wet Flashover	2



CONSTRUCTION STANDARDS

SPAN GUYS

△			
△			



ULTIMATE HOLDING CAPACITY	
	F2.8
Torque	(lbs)
(ft-lbs)	8" Double Helix 1" x 7' Rod
1000	17,000
2000	21,000
3000	26,000
4000	34,000
5000	36,000
6000	36,000
7000	N/A
8000	N/A
9000	N/A
10000	N/A

Notes:

1. A minimum of 6 1/2' of the F2.8 anchor/rod from the top of the helix must be in the ground to obtain the rated holding capacity.

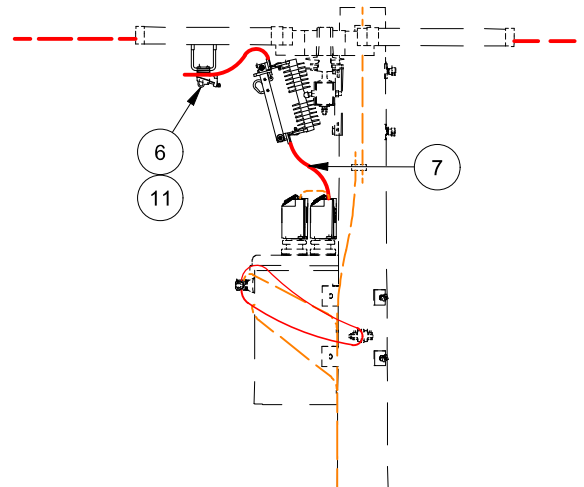
ITEM NO.	DESCRIPTION	F2.8
		QTY.
1	8" Double Helix Screw Anchor, 17,000 ft-lbs.	1
2	Anchor Rod 1" x 7' - 36,000 lbs. Ultimate Tensile	1
3	Triple Eye Anchor Nut 1"	1



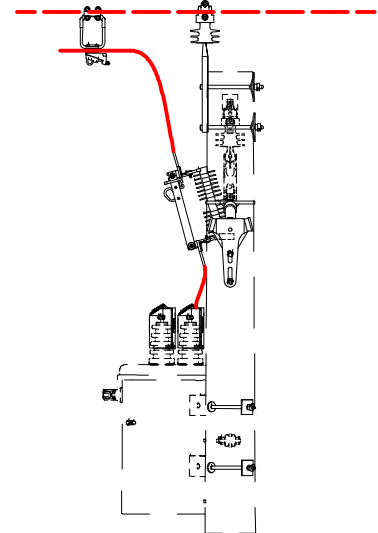
CONSTRUCTION STANDARDS

DOUBLE HELIX SCREW ANCHORS

△			
△			



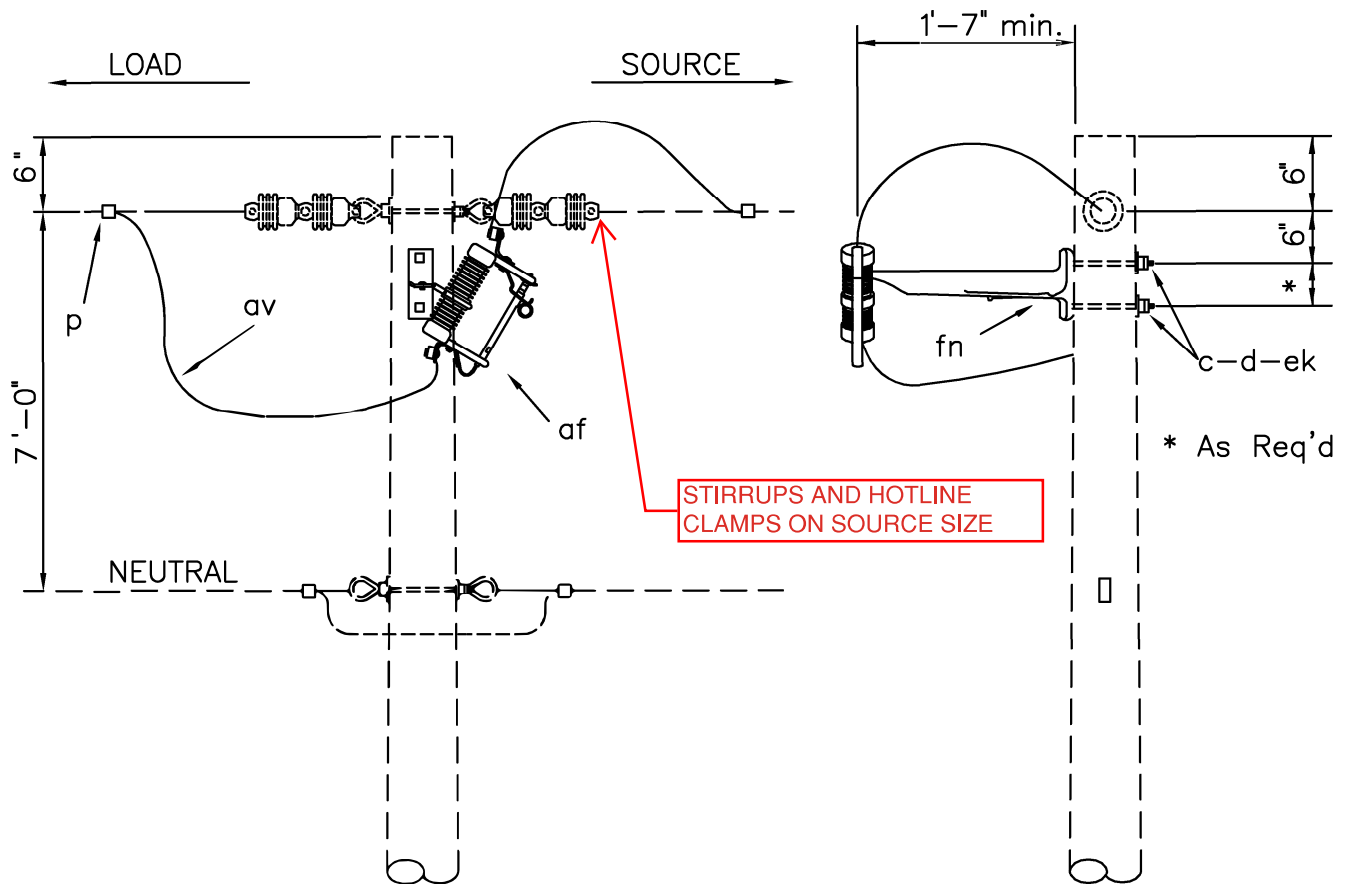
G1.4



G1.5

1. REFER TO H1.1 FOR GROUNDING ASSEMBLY.
2. POSITION TRANSFORMER SO THAT THE SERVICE TAKEOFF IS LOCATED MIDWAY BETWEEN TRANSFORMER HANGER BRACKETS.
3. WHEN MOUNTING TO C3.1/3.1L OR C4.1G, USE MS3.1/4.1 AS REQUIRED TO MAINTAIN JUMPER CLEARANCE TO STRUCTURE.

DATE	REVISION	#	 1550 E REPUBLIC RD SPRINGFIELD, MO 65804 Ph: 417-888-0645 Fax: 417-888-0657 www.tothassociates.com CERTIFICATE OF AUTHORITY: WA# 604 082 498 © 2026 Toth and Associates, Inc.	DWN. BY: DBJ	PROJECT: ELDON-DUCKADUSH RECONDUCTOR LOCATION: MASON AND JEFFERSON COUNTIES, WA CLIENT: MASON COUNTY PUD 1 SHELTON, WASHINGTON	SHEET NO. EDR.D05.04
09/04/2026	ISSUED FOR BID	A		CKD. BY: EAN		
				APPD. BY: VFW		
				DATE: 08/13/2026		
				TITLE: G1.4 - G1.5 CONVENTIONAL TRANSFORMER 1 PHASE ASSEMBLY		



NOTE: Specify fuse size or solid blade

ITEM	QTY	MATERIAL
c	2	Bolt, machine, 5/8" x req'd length
d	2	Washer, square, 2 1/4"
p	2	Connector, compression type
af	1	Cutout, distribution, open (15 kV)
av		Jumpers, as required
ek	2	Locknuts
fn	1	Bracket, extension



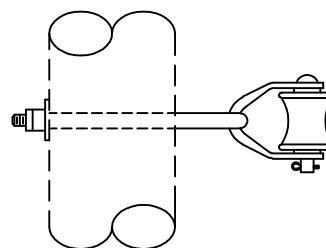
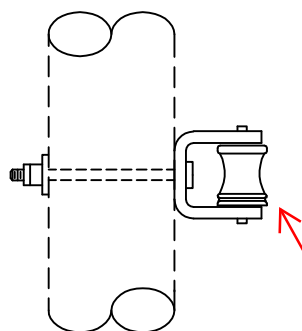
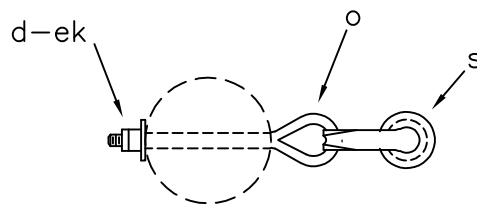
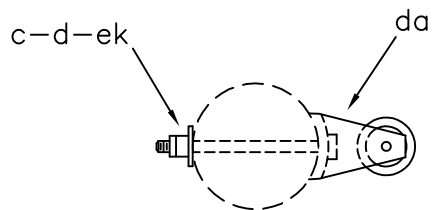
CUTOUT – SINGLE PHASE

APRIL 2005

RUS

12.47/7.2 kV

S1.1
(M3-4)



J2.1

J2.2

ADD DEADEND
AUTOMATICS BY
SECONDARY
CONDUCTOR
SIZES.

ITEM	MATERIAL	J2.1	J2.2
		QTY	QTY
c	Bolt, machine, 5/8" X req'd length	1	
d	Washer, 2 1/4" square	1	1
o	Bolt, eye, 5/8" X req'd length		1
s	Clevis, secondary, swinging, insulated		1
da	Bracket, insulated	1	
ek	Locknuts	1	1

DESIGN PARAMETERS:
MAXIMUM LINE ANGLES

J2.1: 60°
J2.2: 60°

SECONDARY ASSEMBLIES
(LARGE ANGLE)

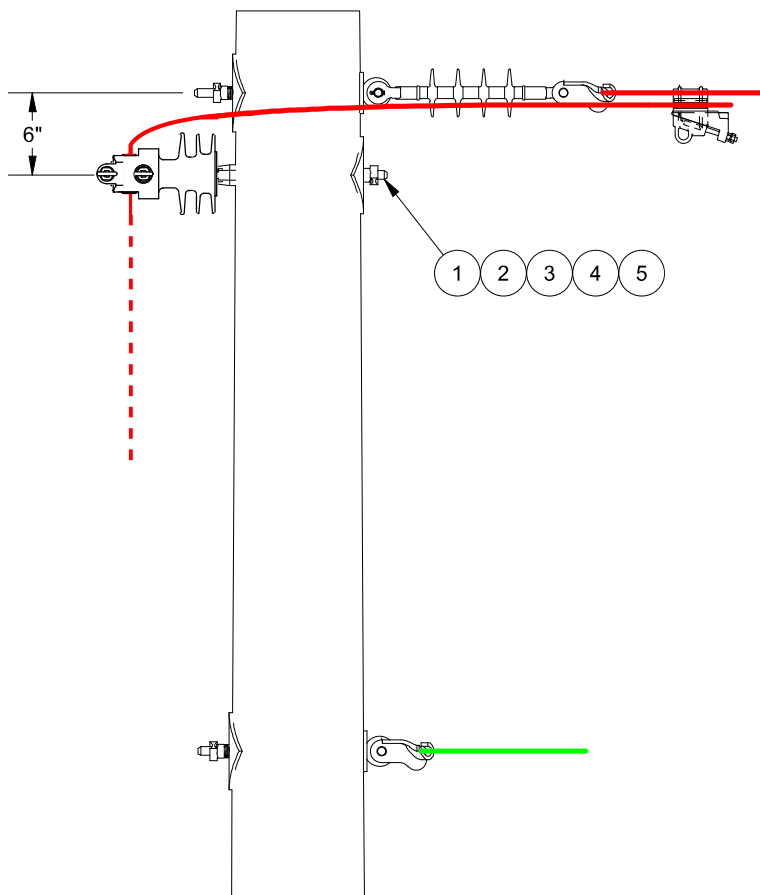
APRIL 2005

RUS

J2.1,J2.2
(J10),(J7,J7C)

LIST OF MATERIALS FOR MS-3.1-4.1

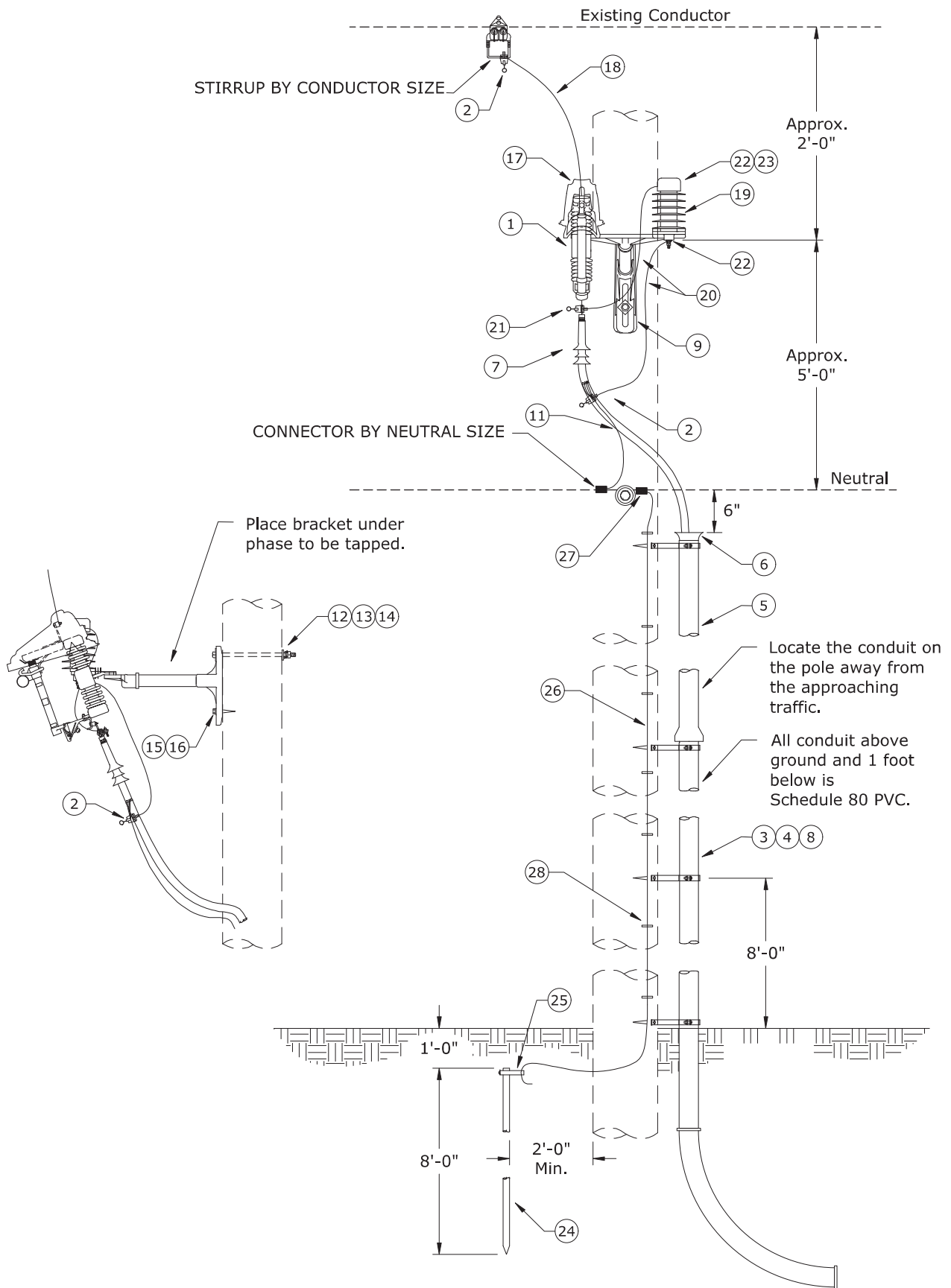
REF.	QTY.	DESCRIPTION	MANUFACTURER	PART NO.
1	1	INSULATOR, POLY, VISE TOP, 15KV	HENDRIX	HPI-15VTP-01
2	1	PIN, TRANSFORMER LEAD, 5/8 BOLT ADAPTER	MACLEAN POWER	J2840Z
3	1	BOLT, MACHINE 5/8" X 16", SQ HEAD, W/ NUT, GALV	HUGHES BROTHERS	B616-6
4	1	WASHER, SQ CURVE 3" X 3" X 1/4", 11/16" HOLE, GALV	HUGHES BROTHERS	SCW3-60
5	1	WASHER, DB COIL SPRING LOCK, 11/16" HOLE	HUGHES BROTHERS	SLW2-60



NOTES:

1. USE ASSEMBLY AS NEEDED TO MAINTAIN STRUCTURE CLEARANCE FROM JUMPER.
2. MAINTAIN 6" MINIMUM SPACING FROM GUY OR OTHER CONDUCTOR MOUNTS ON POLE.

DATE	REVISION	#	 1550 E REPUBLIC RD SPRINGFIELD, MO 65804 Ph: 417-888-0645 Fax: 417-888-0657 www.tothassociates.com CERTIFICATE OF AUTHORITY: WA# 604 082 498 © 2026 Toth and Associates, Inc.	DWN. BY: DBJ	PROJECT: ELDON-DUCKABUSH RECONDUCTOR
09/04/2026	ISSUED FOR BID	A		CRD. BY: EAN	LOCATION: MASON AND JEFFERSON COUNTIES, WA
				APPD. BY: WFW	CLIENT: MASON COUNTY PUD 1 SHELTON, WASHINGTON
				DATE: 08/12/2026	
				TITLE: MS3.1/4.1 JUMPER SUPPORTING POST INSULATOR ASSEMBLY	SHEET NO. EDR.D05.08



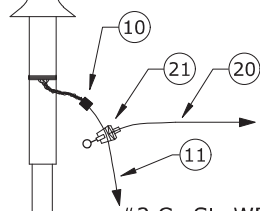
CONSTRUCTION STANDARDS

SINGLE PHASE
PRIMARY RISER

RA			
			DK

To Cutout

Pothead

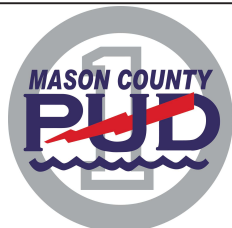
#4 Cu Red to
Lightning Arrester
Ground#2 Cu Str WP to
System Neutral

Pothead Connection Detail

Notes:

4. Connect concentric neutrals to arrester ground using #4 Cu, Red.
5. Make arrester ground terminal-to-concentric neutral jumper as short as possible.

ITEM NO.	DESCRIPTION	UA1.2	
		Additional Material	
		QTY.	
1	Cutout, Polymer, Universal, 100A, 16kA Asym.	1	
2	Clamp, Hotline, GP 1520, #8 to 2/0 Str, Cu Only	1	
3	Screw, Lag, 1/2" x 3", Fetter Drive, Drive Point	6	
4	Bracket, Standoff Riser, 10 1/2"	3	
5	Conduit, PVC, 2" X 10', Sch 80	30	
6	End Bell, 2", Sch 40	1	
7	Terminator, 15kV, Cold-Shrink JCN & CN, #2	1	
8	Clamp, Standoff Bracket, Conduit, 2"	3	
9	Bracket, Arrester/Cutout Mounting, 1ø Fiberglass 18"	1	
10	Connector, Crimpet, Cu 2/2 - 2/2 (2C2)	1	
11	Conductor, Cu #2, 1/C, 7-Str, SD, 600V, HMP	10	
12	Bolt, Machine, 5/8" x 12", 12,400 lbs. Ultimate Tensile	1	
13	Washer, Curved, Square, Cast, 3" x 3" x 3/8" Thick x 13/16" Hole	1	
14	Washer, Lock, Spring, Double Coil, Galv. 5/8"	1	
15	Screw, Lag, 1/2" x 4 1/2", Twist Drive, Drive Point	1	
16	Washer, Flat, Round Galv., 1/2"	1	
17	Guard, Wildlife, Cutout, Polymer	1	
18	Conductor, Cu 1/C #2, 7-Str, 600V, Red, THW	3	
ITEM NO.	DESCRIPTION	LA2	
		QTY.	
19	Arrester, Surge, 9kV, MOV, Riser Pole	1	
20	Conductor, Cu 1/C #4, 7-Str, 600V, Red, THW	7	
21	Clamp, Hotline, GP 1520, #8 to 2/0 Str, Cu Only	2	
22	Connector, Compression Lug, #4, Cu/Al, One-Hole, Tin-Plated, For Arrester	2	
23	Guard, Wildlife, Polymer Arrester	1	
ITEM NO.	DESCRIPTION	N1	
		QTY.	
24	Rod, Ground, 5/8" x 8'	1	
25	Clamp, Ground Rod, 5/8", Bronze Small	1	
26	Conductor, Copper-Clad Steel, #4 Cu Equivalent, Covered	40	
27	Connector, Cabelok, Al/Cu, #2-2/0 Run, #6-#1 Tap	1	
28	Staple, Ground, Barbed, Galv. 1 1/2"	24	



CONSTRUCTION STANDARDS

SINGLE PHASE
PRIMARY RISERPAGE:
2 of 2

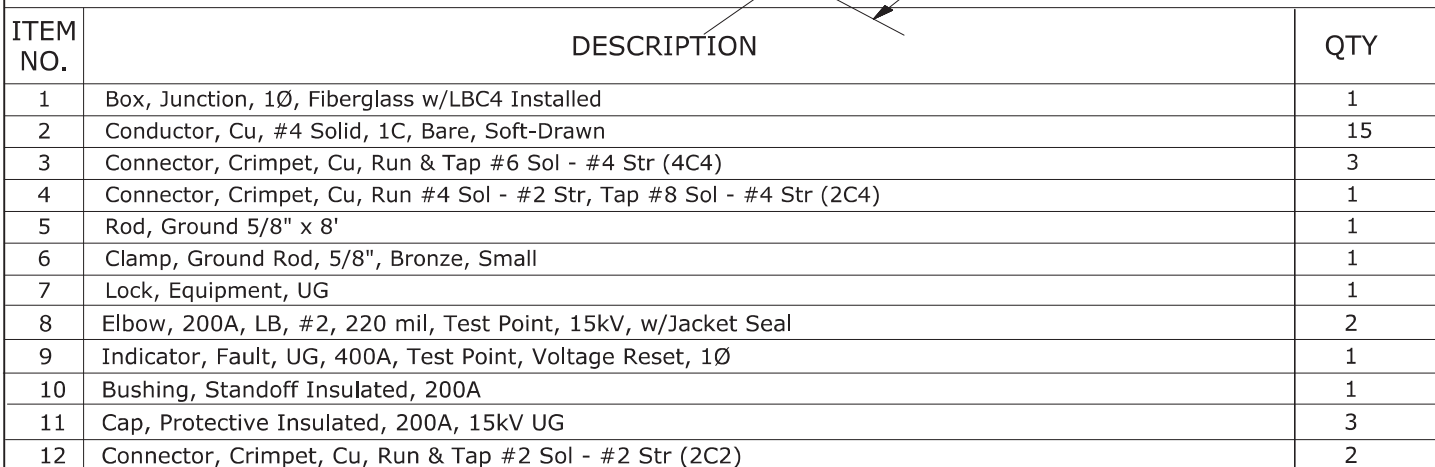
UA1.2





R			

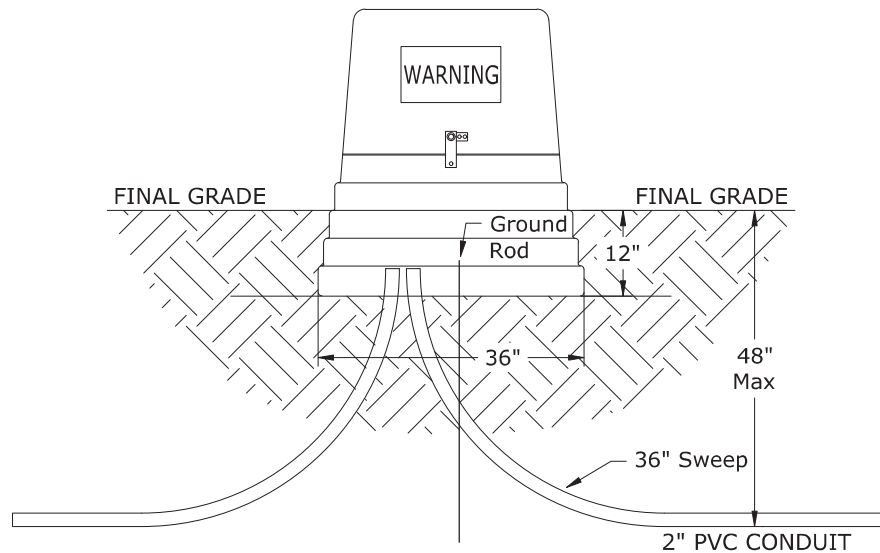
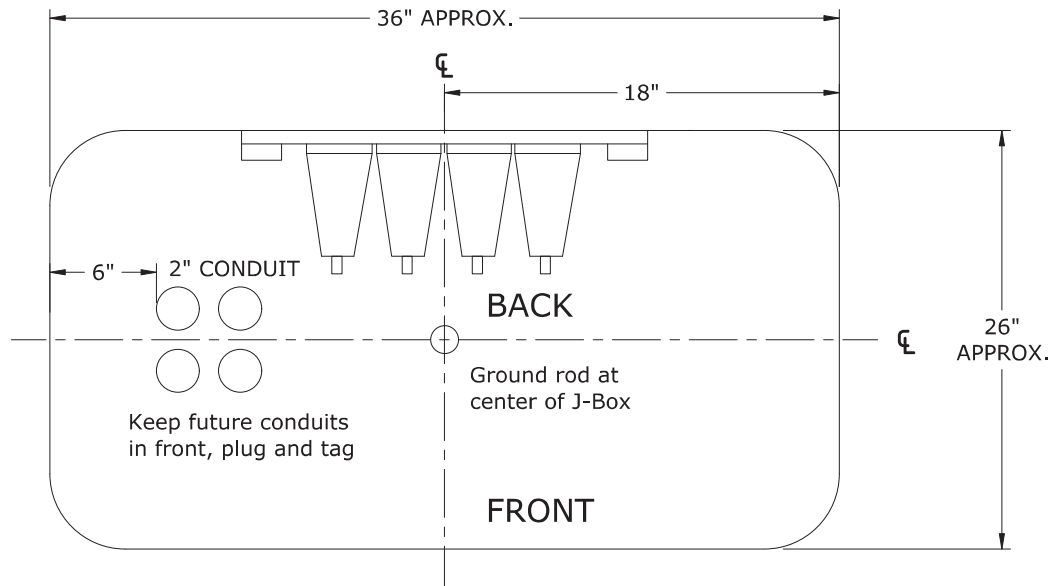
ITEM NO.	DESCRIPTION	UK1.1
		QTY.
1	End Bell, 1", Sch 40	1
2	Bracket, Standoff Riser 10 1/2"	3
3	Clamp, Standoff Bracket, 1" Conduit	3
4	Screw, Lag 1/2" X 3", Fetter Drive, Drive Point	6
5	Conduit, PVC, 1" x 10', Sch 80	30
6	Elbow, PVC, 1", 90°, 24" Radius, Sch 40	1
ITEM NO.	DESCRIPTION	UK2.1
		QTY.
1	End Bell, 2", Sch 40	1
2	Bracket, Standoff Riser 10 1/2"	3
3	Clamp, Standoff Bracket, 2" Conduit	3
4	Screw, Lag 1/2" X 3", Fetter Drive, Drive Point	6
5	Conduit, PVC, 2" x 10', Sch 80	30
6	Elbow, PVC, 2", 90°, 24" Radius, Sch 40	1
ITEM NO.	DESCRIPTION	UK3.1
		QTY.
1	End Bell, 3", Sch 40	1
2	Bracket, Standoff Riser 10 1/2"	3
3	Clamp, Standoff Bracket, 3" Conduit	3
4	Screw, Lag 1/2" X 3", Fetter Drive, Drive Point	6
5	Conduit, PVC, 3" x 10', Sch 80	30
6	Elbow, PVC, 3", 90°, 24" Radius, Sch 40	1



1Ø JUNCTION BOX
4-WAY

US1.PJ



Notes:

1. Typical elbow arrangement is shown.
2. Do not put dirt inside junction box. Space is required for cable slack and operating clearance.
3. Leave cable slack for future operations.
4. Future conduits shall be plugged w/ 2" plastic conduit plug.
5. Futures should be tagged with direction and length of conduit.
6. Proof conduit and install sequentially numbered, 2500 lb mule tape in all futures.



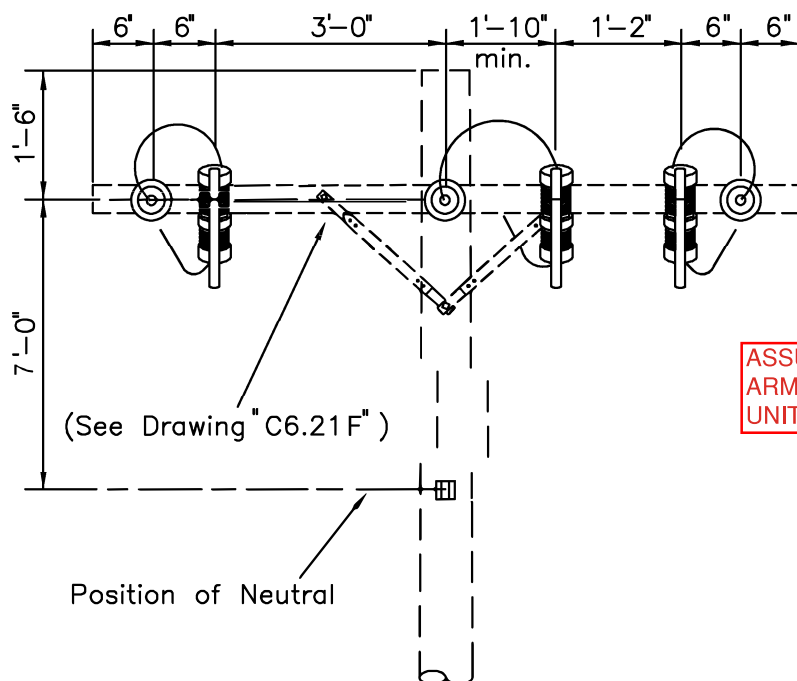
CONSTRUCTION STANDARDS

1Ø JUNCTION BOX
4-WAY

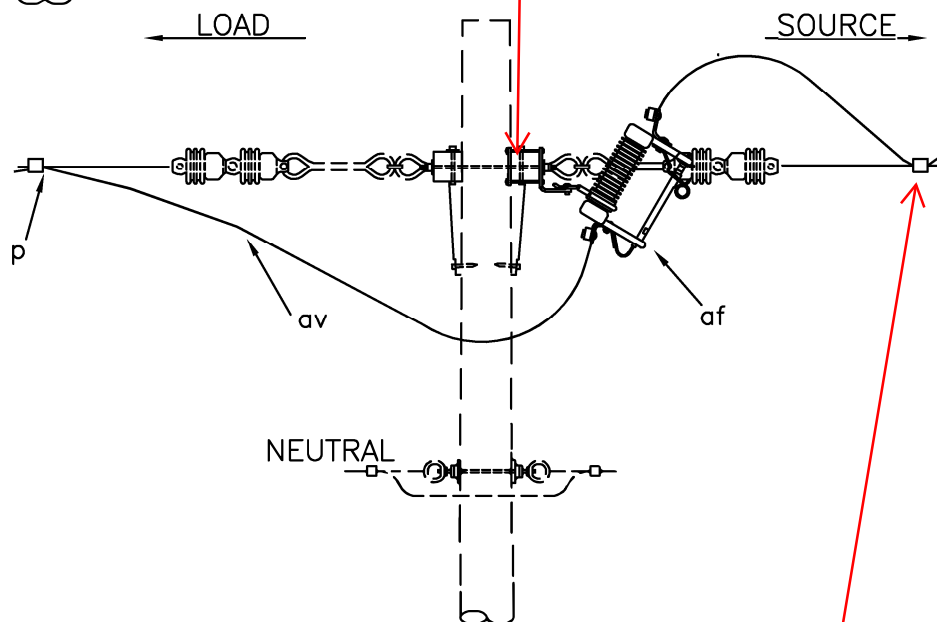
PAGE:
2 of 2

US1.PJ



ASSUME FIBERGLASS DE ARM - NOT A PART OF THIS UNIT.



STIRRUPS AND HOTLINE CLAMPS ON SOURCE SIZE

NOTES:

1. Specify fuse size or solid blade.
2. Mount cutouts so that blades face climbing face of pole.
3. If mounted on separate arm, mount 4' below OH primary arm.

ITEM	QTY	MATERIAL
P	6	Connector, compression type
af	3	Cutout, distribution open (15 kV)
av		Jumpers, as req'd

CUTOUT BRACKETS TO BE MOUNTABLE ON DEADEND FIBERGLASS CROSSARMS



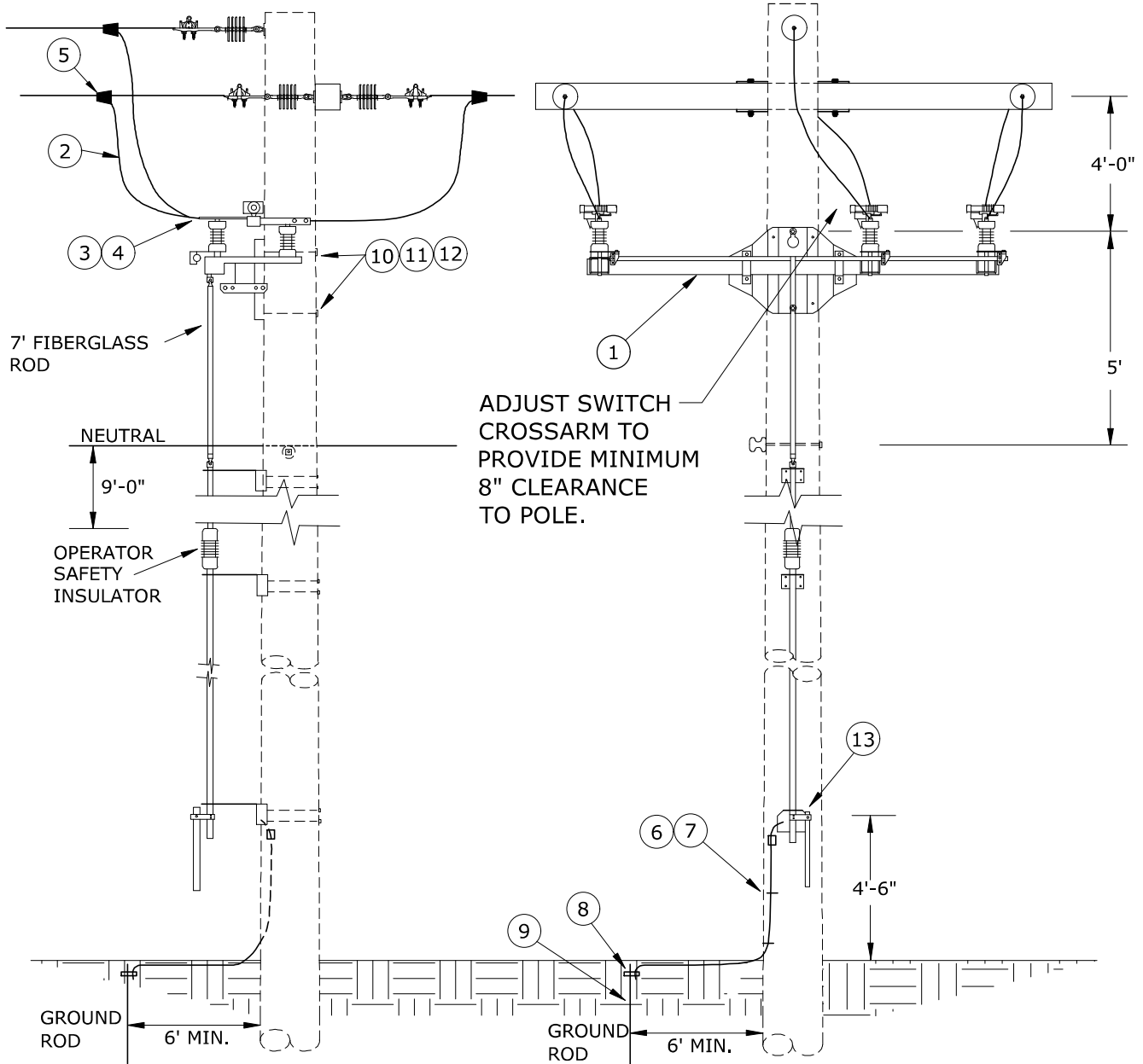
CUTOUTS
(THREE SINGLE-PHASE)

APRIL 2005

RUS

12.47/7.2 kV

S1.3



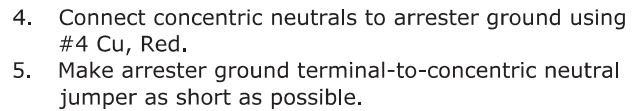
ITEM NO.	DESCRIPTION	S2.32
		QTY.
1	Switch, loadbreak, horizontal, 15kV	1
2	Conductor, OH, 336 MCM AL, Bare	60
3	Connector, Clamp, 336 to NEMA 2-Hole	6
4	Bolt, Nut, Washer, SS, 1/2" x 2", Assembly	12
5	Connector, Tap, Power Booster, 397-397	6
6	Conductor, #4 CU, covered	20
7	Staples, Ground wire	5
8	Clamp, Ground rod, 5/8", Bronze, Small	1
9	Rod, Ground, 8'	1
10	Bolt, Machine, Galv., 3/4" x 16"	2
11	Washer, Curved, Cast 4" x 4" x 13/16" Hole	2
12	Washer, Spring, 3/4"	2
13	Lock, Padlock, Hardened Stainless Steel	1



CONSTRUCTION STANDARDS

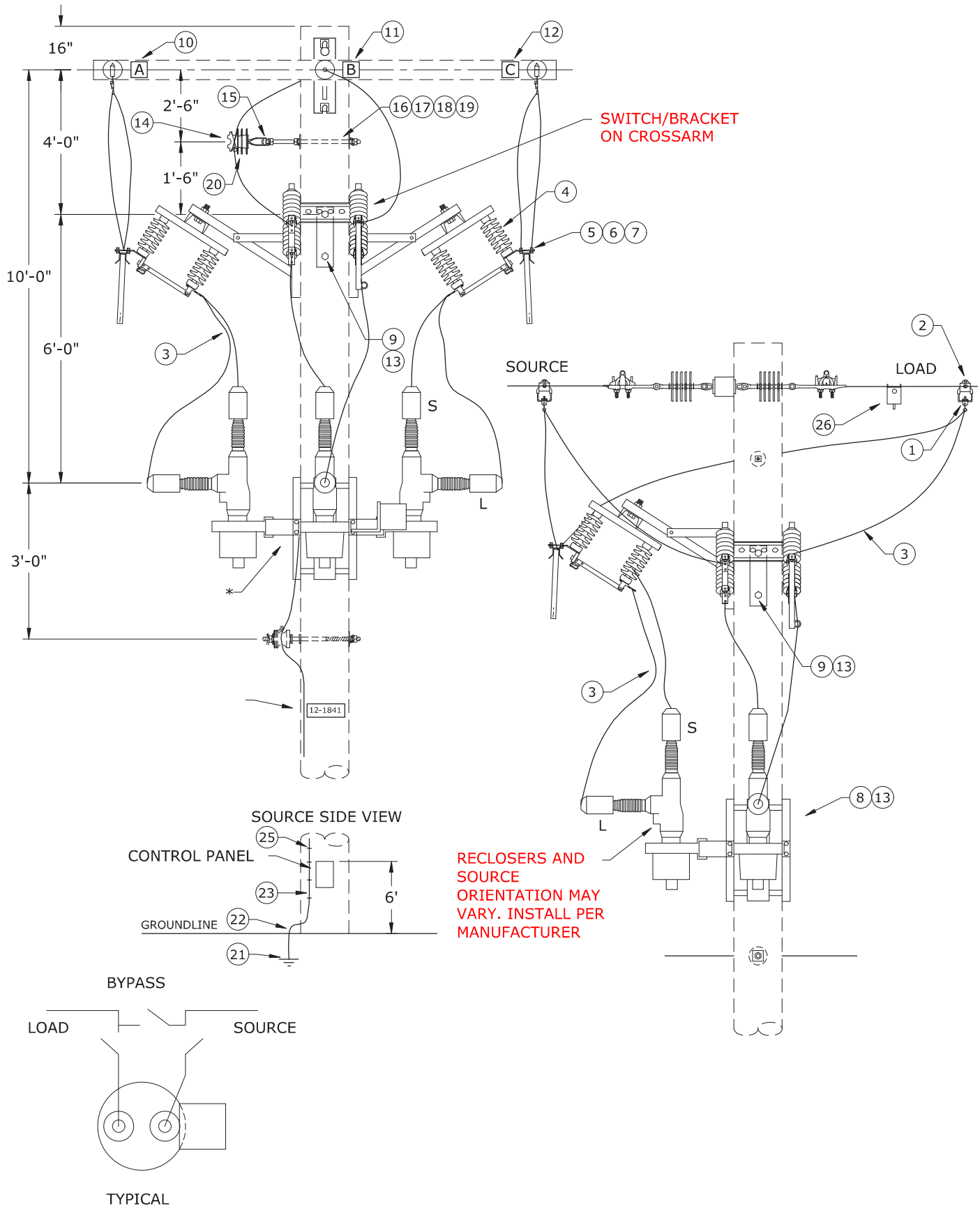
3Ø SWITCH
UNDERSLUNG

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MASON COUNTY
PUD

THREE PHASE
PRIMARY RISER



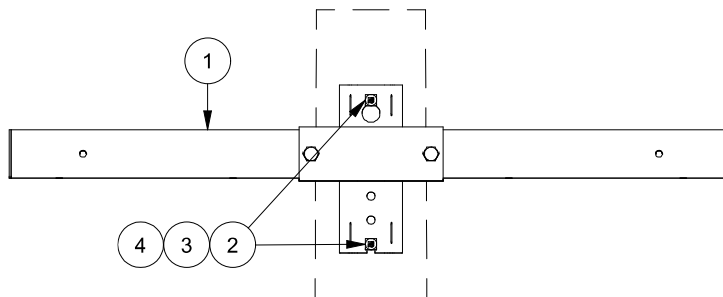
CONSTRUCTION STANDARDS THREE 1Ø SOLID DIELECTRIC RECLOSERS

DATE	ENGR	OPS

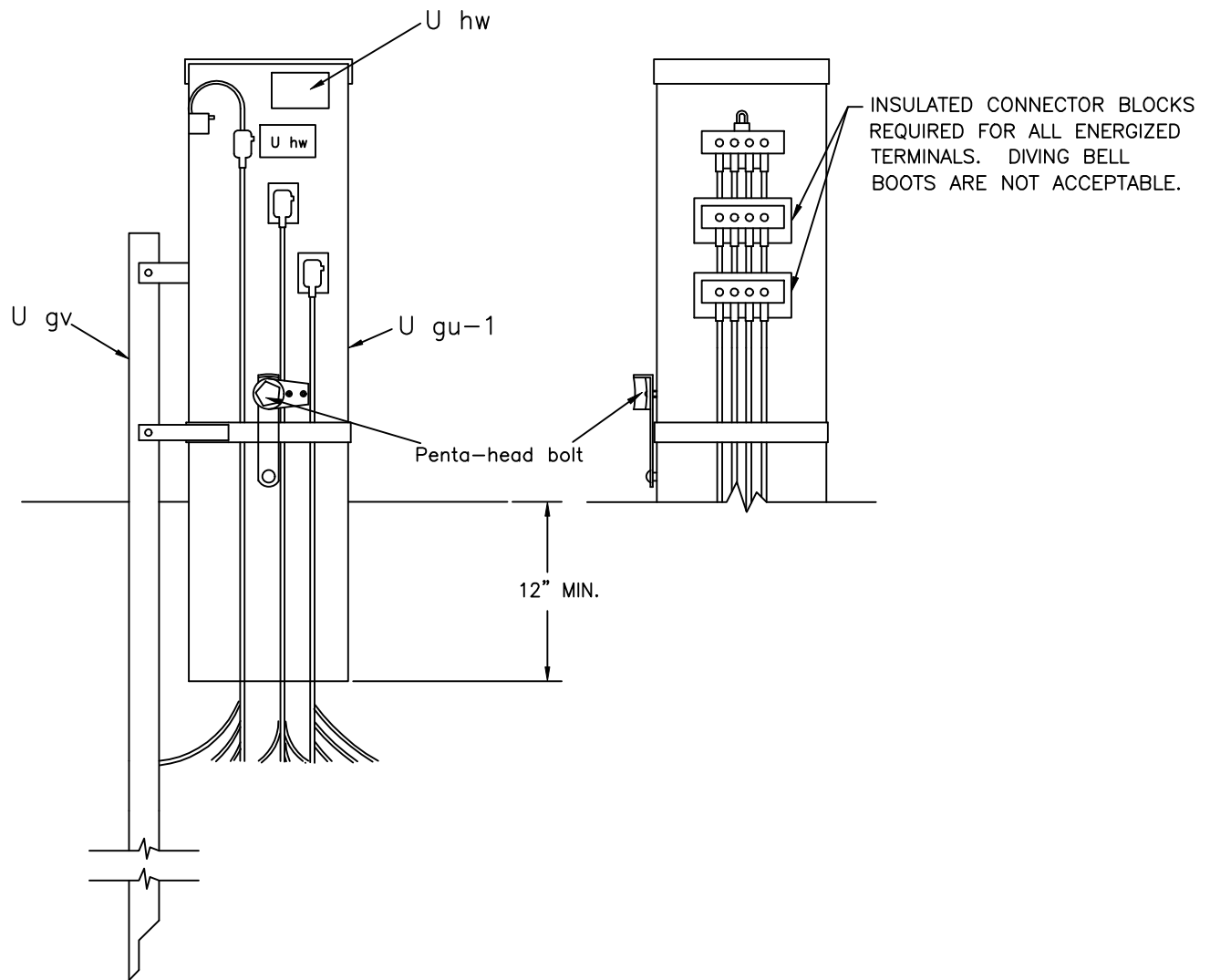
		R3.3
ITEM NO.	DESCRIPTION	QTY.
1	Clamp, Hotline GP 1540	6
2	Clamp, Hotline Stirrup, 266.5 - 397.5 Al/Cu	6
3	Conductor, 4/0 Cu, 1/C, 600V XLP, 19 Str.	80
4	Switch, Transfer 600A	3
5	Connector, Comp Lugs, Cu 4/0 to Cu 4/0	12
6	Bolt, Machine 1/2" x 2", Stainless Steel	24
7	Bolt, Assembly, 1 1/2" x 2", SS W/ Belleville & Flat Washers	48
8	Bolt, Machine 5/8" x 12", Galv., 12,400 lbs. Ultimate Tensile	4
9	Bolt, Machine 5/8" x 14", Galv., 12,400 lbs. Ultimate Tensile	2
10	Tag, Phasing - A	1
11	Tag, Phasing - B	1
12	Tag, Phasing - C	1
13	Washer, Curved, Square, Cast 3" x 3" x 3/8" Thick x 13/16" Hole	4
ITEM NO.	DESCRIPTION	QTY.
14	Insulator, Pin, Vise-top, Polyethylene	1
15	Pin, Adapter	1
16	Washer, Curved, Square, Cast 3" x 3" x 3/8" Thick x 13/16" Hole	2
17	Bolt, Double, Arm, 5/8" x 16" Galv.	1
18	Washer, Lock, Spring, Double Coil, Galv., 5/8"	1
19	Washer, Lock, Spring, Single Coil, Galv., 5/8"	2
20	Wire, Tie, Al Annealed #4 SD	10
ITEM NO.	DESCRIPTION	N1 QTY.
21	Rod, Ground, 5/8" x 8'	1
22	Clamp, Ground rod, 5/8", Small, Bronze	1
23	Conductor, Cu-Clad Steel, #4 Cu Equivalent, Black Jacket	36
24	Connector, Compression, Cu/Al, Neutral	1
25	Staple, Ground, Barbed, Galv. 1 1/2"	10
ITEM NO.	DESCRIPTION	QTY.
26	Fault Indicator, OH Beacon, 400A	3
27	Conduit, Flex, Liquid Tight, 3/4"	10
28	Conduit, PVC, 3/4" x 10', Sch. 80	3
29	Conductor, Cu, #12, 600V, 19 Strand (Streetlight)	35
30	Standoff Bracket 10 1/2"	3

LIST OF MATERIALS FOR M.FIBER

REF.	QTY.	DESCRIPTION	MANUFACTURER	PART NO.
1	1	5' CROSSARM, FIBERGLASS, TANGENT	PUPI	TB1000060SPX2
2	2	BOLT, MACHINE 5/8" X 16", SQ HEAD, W/ NUT, GALV	HUGHES BROTHERS	B616-6
3	2	WASHER, SQ CURVE 3" X 3" X 1/4", 11/16" HOLE, GALV	HUGHES BROTHERS	SCW3-60
4	2	WASHER, DB COIL SPRING LOCK, 11/16" HOLE	HUGHES BROTHERS	SLW2-60



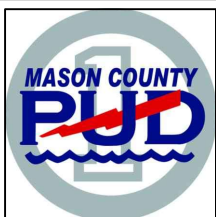
DATE	REVISION	#	 1550 E REPUBLIC RD SPRINGFIELD, MO 65804 Ph: 417-888-0645 Fax: 417-888-0657 www.tothassociates.com CERTIFICATE OF AUTHORITY: WA# 604 082 498 © 2026 Toth and Associates, Inc.	DWN. BY: DBJ	PROJECT: ELDON-DUCKABUSH RECONDUCTOR	
09/04/2026	ISSUED FOR BID	A		CRD. BY: EAN		LOCATION: MASON AND JEFFERSON COUNTIES, WA
				APPD. BY: WFW	CLIENT: MASON COUNTY PUD 1 SHELTON, WASHINGTON	
				DATE: 08/17/2026		
				TITLE:	M.FIBER (WD)	SHEET NO. EDR.D05.16
					TAGENT FIBER / ADSS ASSEMBLY	



NOTES:

1. INSTALL "WARNING" SIGN ON OUTSIDE OF PEDESTAL.
2. ITEM Ugv OPTIONAL – SEE PEDESTAL MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
3. ALL PEDESTALS SHALL BE GROUNDED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL SAFETY CODE (NESC).

ITEM	QTY.	MATERIAL
Ugu-1	1	Power pedestal
Ugv	1	Stake (if necessary)
Uhw	1	Sign, "WARNING" (outside pedestal)
Uhw	1	Sign, "DANGER" (inside pedestal)



CONSTRUCTION STANDARDS

SECONDARY PEDESTAL UNDERGROUND CABLE

REVISIONS			
Δ	DATE	ENGR	OPS