

BILL OF MATERIAL (Type of CU: POLE)

CU: C*PT-TN-3IA0B				
ITEM NO.	QTY.	UOM	IUSA MID	
1	9	EA	1000910800	NUT LCK MF SQ 7/8" BOLT GALV
2	12	EA	1000910900	NUT LCK MF SQ 1" BOLT GALV
3	3	EA	1000911000	NUT LCK MF SQ 1-1/4" BOLT GALV
4	6	EA	6000273770	NUT SQ 7/8" BOLT GALV
5	9	EA	1000912000	NUT SQ 1" BOLT GALV
6	3	EA	6000273782	NUT SQ 1-1/4" BOLT GALV
7	3	EA	1035475014	BOLT SQ HEAD 7/8 X 14 W/ SQ NUT (NOTE D)
8	6	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE D)
9	12	EA	1035476024	BOLT SQ HEAD 1 X 24 W/ SQ NUT (NOTE D)
10	3	EA	6000272050	BOLT SQ HEAD 1-1/4 X 28 W/ SQ NUT (NOTE D)
11	4	EA	6000272300	BOLT DRILLED, GALV., 7/8 X 4-3/4 W/SN & COTTER PIN
12	13	EA	6000274612	WASHER HELICAL (7/8")
13	12	EA	6000274614	WASHER HELICAL (1")
14	3	EA	6000274618	WASHER HELICAL (1 1/4")
15	12	EA	6000274880	WASHER 4" SQ CURVED (7/8")
16	6	EA	6000274860	WASHER 4" SQ CURVED (1")
17	3	EA	6000274894	WASHER 4" x 9" RECT CURVED (1 1/4")
18	3	EA	6000274846	WASHER 4" SQ FLAT (1 1/4")
19	3	EA	6000274505	DEAD END TEE, 60K
20	9	EA	6000274507	HEAVY GUYING TEE, 70K
21	18	EA	6000273255	GAIN GRID, 4" X 6-3/4", BONDING F/ 1" BOLTS
22	3	EA	6000273265	GAIN GRID, XARM BONDING F/ 1-1/4" BOLTS
23	3	EA	6000273231	GAIN GRID, 4-1/2" X 9", BONDING F/ 7/8 BOLTS
24	4	EA	1005259000	GRIP PRFRMD GUY 19#8 AWLD
25	80	FT	6000252362	WIRE ALWD GUY 19#8
26	4	EA	1010145562	THMBL ROLLER 3-1/4" DIA 1-1/16" H
27	2	EA	6000274527	TURNBUCKLE, 7/8 X 27 (+/- 6 IN), JAW-EYE, 30K
28	4	EA	6000272872	CLEVIS, DEADEND, 6-3/4 IN LENGTH, 25K
29	6	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
30	9	EA	1036200008	CLMP GRND WIRE U-CLIP 1-1/16" H
31	3	EA	6000251024	CLMP GRND WIRE U-CLIP 1-5/16" H
32	4	EA	6000113887	CONN COMP #2 SOL - 19#8 AWLD
33	26	EA	6000113712	WISE, PAR GROOVE GRND CNCTR BRZ, NO. 2 AWG CWLD
34	3	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: XARM)

CU: C*PT-TT-3S-B-FC61				
ITEM NO.	QTY.	UOM	IUSA MID	
35	1	CU	6000740821	SINGLE CROSSARM, STEEL, 7" X 7" X 61' 6"

BILL OF MATERIAL (Type of CU: INSO)

CU: C*CT-TI-9P-D5-19				
ITEM NO.	QTY.	UOM	IUSA MID	
36	6	CUs	6000310768	INS SUS CL52-5 30K M&E GRY (19 UNITS/STRING)
CU: C*CT-TI-3Y-P3-Q				
ITEM NO.	QTY.	UOM	IUSA MID	
36	6	EA	6000313012	INS POLY Y-BALL 30K 19 UNIT EQ. W/COR RING

CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (C*).

NOTE A: OTHER STANDARD DRAWINGS REQUIRED:
 TD FOUNDATION & BACKFILL
 TG GROUND WIRE & GROUND ROD DETAIL
 TK MARKINGS
 TH GUYING ASSEMBLIES
 TR GUY ANCHORS

NOTE B: POLE DRILLING: 7/8" BOLT - 15/16" DIAMETER HOLE
 1" BOLT - 1-1/16" DIAMETER HOLE
 1-1/4" BOLT - 1-5/16" DIAMETER HOLE

NOTE C: TO SEAT SPIKE GRIDS ASSEMBLE ARMS, BRACES AND OTHER REQUIRED HARDWARE. HAND TIGHTEN TO ENSURE FIT. USE HYDRAULIC TOOLS TO SEAT GRIDS PROPERLY.

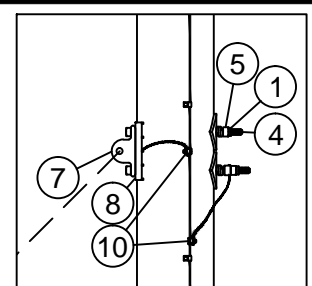
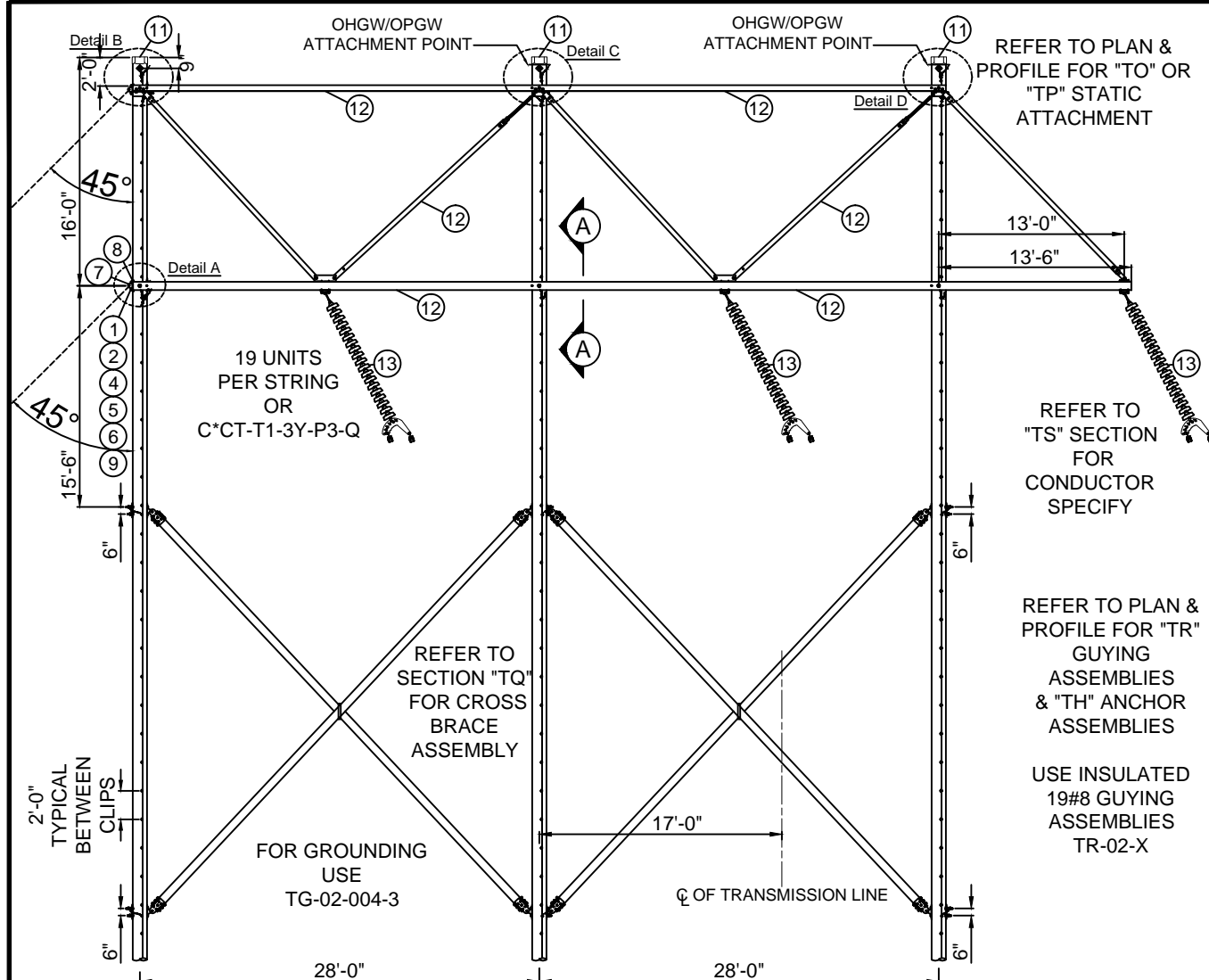
NOTE D: LARGER OR SMALLER BOLTS MAY BE REQUIRED DEPENDING ON THE DIAMETER OF THE POLE USED. SUBSTITUTE MATERIAL ID (MID) ON THE WORK ORDER COMPONENTS PAGE FOR THE LENGTH NEEDED IF DIFFERENT THAN THE GENERIC LENGTH SHOWN IN THE BILL OF MATERIALS. CONTACT ENGINEERING STANDARDS - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

NOTE E: GUYING ANGLES SHOWN ARE GUIDELINES. IF THE SPECIFIC FIELD CONDITIONS IN THE AREA WHERE THIS STRUCTURE IS INSTALLED DO NOT ACCOMMODATE THIS GUYING ARRANGEMENT THEN THE CHANGES TO THE GUYING ARRANGEMENT SHALL BE NOTED ON THE RESPECTIVE PLAN AND PROFILE DRAWING.

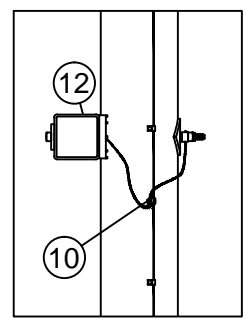
THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.			Drawing Scale: 1" = 12'	
	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - WOOD		REVISION
		345KV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR H-FRAME RUNNING ANGLE - 30° TO 45° STEEL CROSSARM TYPE ECR-2		00
Drwn. By: B. Franklin	Date Dr.: 2/15/2013	Checked By: Becken/Hart	Date Ck.: 3/18/2015	Approved By: Barry R. Hart
			Date App.: 5/20/2015	DATE
				5/21/2015
				Sheet 1

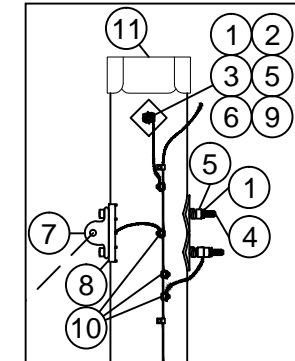
TM2.23.TN-3IA0B-X



Detail 'A'
STEEL CROSSARM
ASSEMBLY NOT
SHOWN FOR CLARITY



Section A-A



Detail 'B'
STEEL CROSSARM
ASSEMBLY NOT
SHOWN FOR CLARITY

BILL OF MATERIAL (Type of CU: POLE)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-3IA6B
1	11	EA	1000910800	NUT LCK MF SQ 7/8" BOLT GALV
2	5	EA	6000273770	NUT SQ 7/8" BOLT GALV
3	3	EA	1035475014	BOLT SQ HEAD 7/8 X 14 W/ SQ NUT (NOTE E)
4	4	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE E)
5	7	EA	6000274612	WASHER HELICAL (7/8")
6	10	EA	6000274880	WASHER 4" SQ CURVED (7/8")
7	2	EA	6000274505	DEAD END TEE, 60K
8	2	EA	6000273231	GAIN GRID, 4-1/2" X 9", BONDING F/ 7/8 BOLTS
9	5	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
10	16	EA	6000113712	WISE, PAR GROOVE GRND CNCTR BRZ, NO. 2 AWG CWLD
11	3	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: XARM)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TT-3S-A-FC70
12	1 CU	EA	1036235455	SINGLE CROSSARM, STEEL, 7" X 7" X 70"

BILL OF MATERIAL (Type of CU: INSO)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-19
13	3 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (19 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-3Y-P3-Q
13	3	EA	6000313012	INS POLY Y-BALL 30K 19 UNIT EQ. W/COR RING

USE THE MACRO CUs INSTEAD OF INDIVIDUAL CU COMPONENTS FOR EASE OF WORK ORDER ENTRY.

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN3IA6B-K2H2	(6) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S2A2Z1-K	(2) TP-W-TS-G-H
C*M-TN3IA6B-K2HO	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2Z1-K	TP-W-TS-G-H TO-W-TS-G-O
C*M-TN3IA6B-K2HS	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2Z1-K	TP-W-TS-G-H TO-W-TS-G-S
C*M-TN3IA6B-L2H2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2Z1-L	(2) TP-W-TS-G-H
C*M-TN3IA6B-L2HO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2Z1-L	TP-W-TS-G-H TO-W-TS-G-O
C*M-TN3IA6B-L2HS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2Z1-L	TP-W-TS-G-H TO-W-TS-G-S

CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (C*).

- NOTE A: OTHER STANDARD DRAWINGS REQUIRED:
- TD FOUNDATION & BACKFILL
 - TG GROUND WIRE & GROUND ROD DETAIL
 - TK MARKINGS
 - TH GUYING ASSEMBLIES
 - TR GUY ANCHORS

- NOTE B: POLE DRILLING:
- 7/8" BOLT - 15/16" DIAMETER HOLE
 - 1" BOLT - 1 1/16" DIAMETER HOLE
 - 1 1/4" BOLT - 1 5/16" DIAMETER HOLE

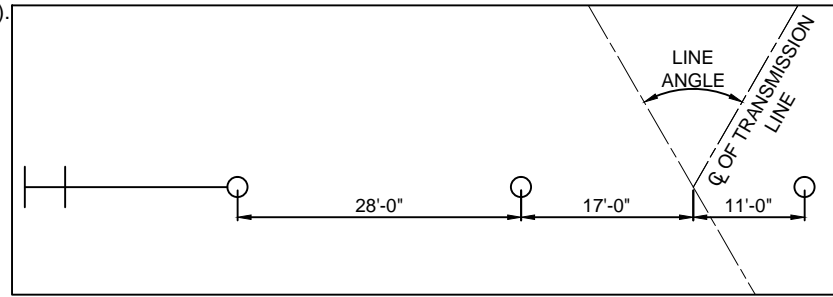
NOTE C: TO SEAT SPIKE GRIDS ASSEMBLE ARMS, BRACES AND OTHER REQUIRED HARDWARE. HAND TIGHTEN TO ENSURE FIT. USE HYDRAULIC TOOLS TO SEAT GRIDS PROPERLY.

NOTE D: STRUCTURES USING 100' LONG POLES OR LONGER REQUIRE (2) CROSS BRACES, REFER TO SECTION TQ FOR ADDITIONAL CROSS BRACE ASSEMBLY.

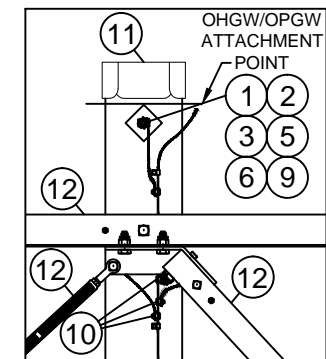
NOTE E: LARGER OR SMALLER BOLTS MAY BE REQUIRED DEPENDING ON THE DIAMETER OF THE POLE USED. SUBSTITUTE MATERIAL ID (MID) ON THE WORK ORDER COMPONENTS PAGE FOR THE LENGTH NEEDED IF DIFFERENT THAN THE GENERIC LENGTH SHOWN IN THE BILL OF MATERIALS. CONTACT ENGINEERING STANDARDS - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

NOTE F: GUYING ANGLES SHOWN ARE GUIDELINES. IF THE SPECIFIC FIELD CONDITIONS IN THE AREA WHERE THIS STRUCTURE IS INSTALLED DO NOT ACCOMMODATE THIS GUYING ARRANGEMENT THEN THE CHANGES TO THE GUYING ARRANGEMENT SHALL BE NOTED ON THE RESPECTIVE PLAN AND PROFILE DRAWING.

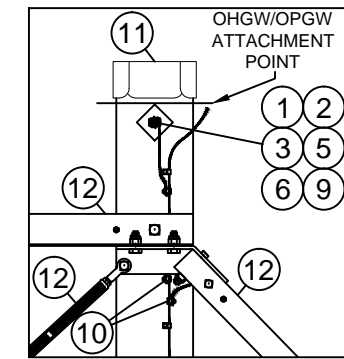
NOTE G: REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.



GUYING PLAN



Detail 'C'

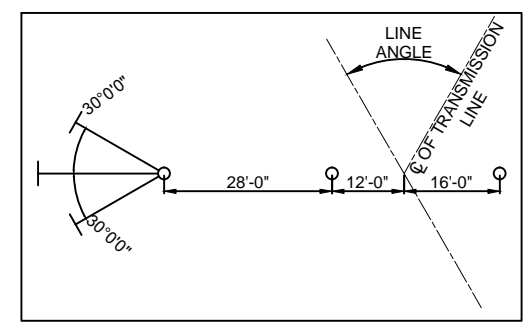
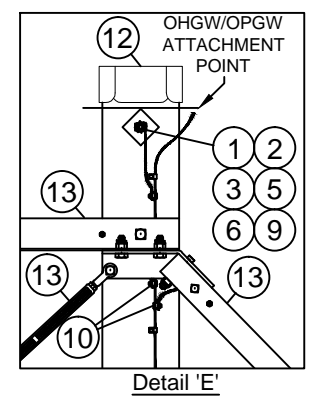
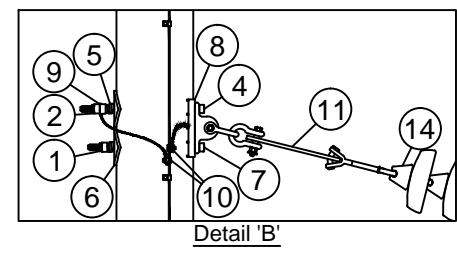
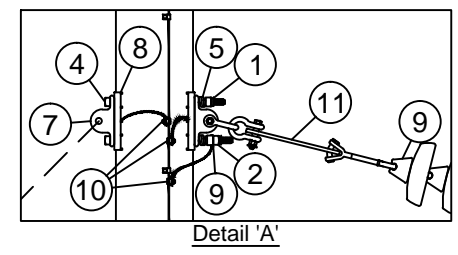
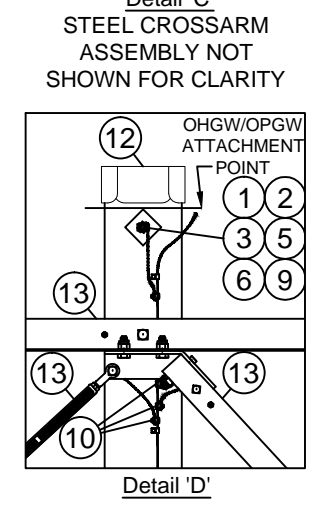
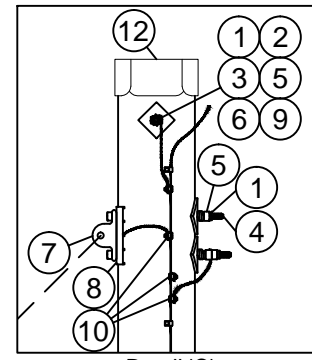
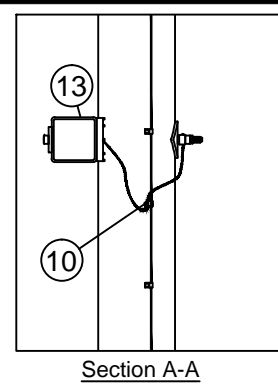
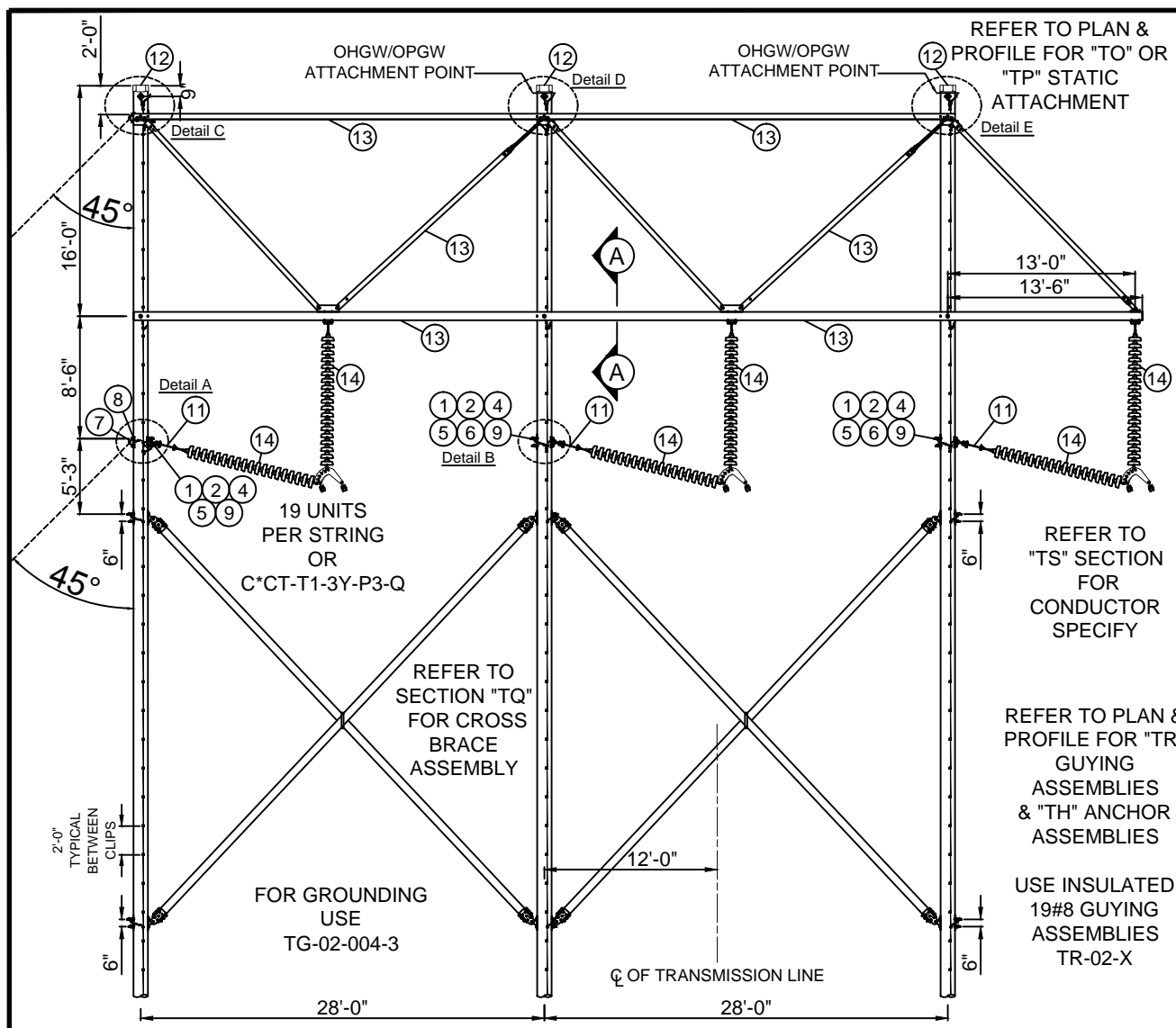


Detail 'D'

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

Contact Engineering Standards - Transmission Section for the creation of new standards and CUs. Drawing Scale: 1" = 12'

	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - WOOD 345KV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR H-FRAME RUNNING ANGLE - 0° TO 3° SINGLE STEEL CROSSARM TYPE EBR-1	REVISION
			00
Drwn. By: B. Franklin	Date Dr.: 2/15/2013	Checked By: Becken/Hart	Date Ck.: 3/18/2015
Approved By: Barry R. Hart	Date App.: 5/20/2015	TM2.23.TN-3IA6B-X	
			Sheet 1



BILL OF MATERIAL (Type of CU: POLE)

CU: C*PT-TN-3IA7B				
ITEM NO.	QTY.	UOM	IUSA MID	
1	15	EA	1000910800	NUT LCK MF SQ 7/8" BOLT GALV
2	7	EA	6000273770	NUT SQ 7/8" BOLT GALV
3	3	EA	1035475014	BOLT SQ HEAD 7/8 X 14 W/ SQ NUT (NOTE E)
4	8	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE E)
5	11	EA	6000274612	WASHER HELICAL (7/8")
6	12	EA	6000274880	WASHER 4" SQ CURVED (7/8")
7	5	EA	6000274505	DEAD END TEE, 60K
8	5	EA	6000273231	GAIN GRID, 4-1/2" X 9", BONDING F/ 7/8 BOLTS
9	7	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
10	21	EA	6000113712	WISE, PAR GROOVE GRND CNCTR BRW, NO. 2 AWG CWLD
11	3	EA	6000273421	EXTENSION STRAP, GALV., 2-1/2 X 12, 40K
12	3	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: XARM)

CU: C*PT-TT-3S-A-FC70				
ITEM NO.	QTY.	UOM	IUSA MID	
13	1 CU	EA	10636235455	SINGLE CROSSARM, STEEL, 7" X 7" X 70"

BILL OF MATERIAL (Type of CU: INSO)

CU: C*CT-TI-9P-D5-19				
ITEM NO.	QTY.	UOM	IUSA MID	
14	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (19 UNITS/STRING)

CU: C*CT-TI-3Y-P3-Q				
ITEM NO.	QTY.	UOM	IUSA MID	
14	6	EA	6000313012	INS POLY Y-BALL 30K 19 UNIT EQ. W/COR RING

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CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN3IA7B-K2H2	(6) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S2A2W1-K	(2) TP-W-TS-G-H
C*M-TN3IA7B-K2HO	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2W1-K	TP-W-TS-G-H TO-W-TS-G-O
C*M-TN3IA7B-K2HS	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2W1-K	TP-W-TS-G-H TO-W-TS-G-S
C*M-TN3IA7B-L2H2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2W1-L	(2) TP-W-TS-G-H
C*M-TN3IA7B-L2HO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2W1-L	TP-W-TS-G-H TO-W-TS-G-O
C*M-TN3IA7B-L2HS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2W1-L	TP-W-TS-G-H TO-W-TS-G-S

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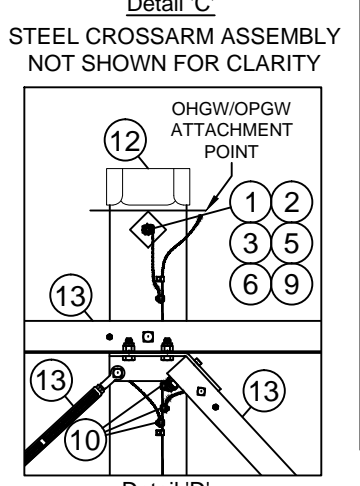
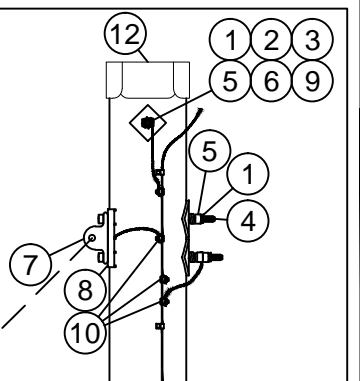
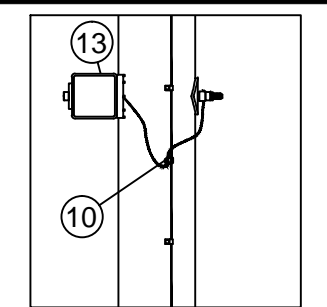
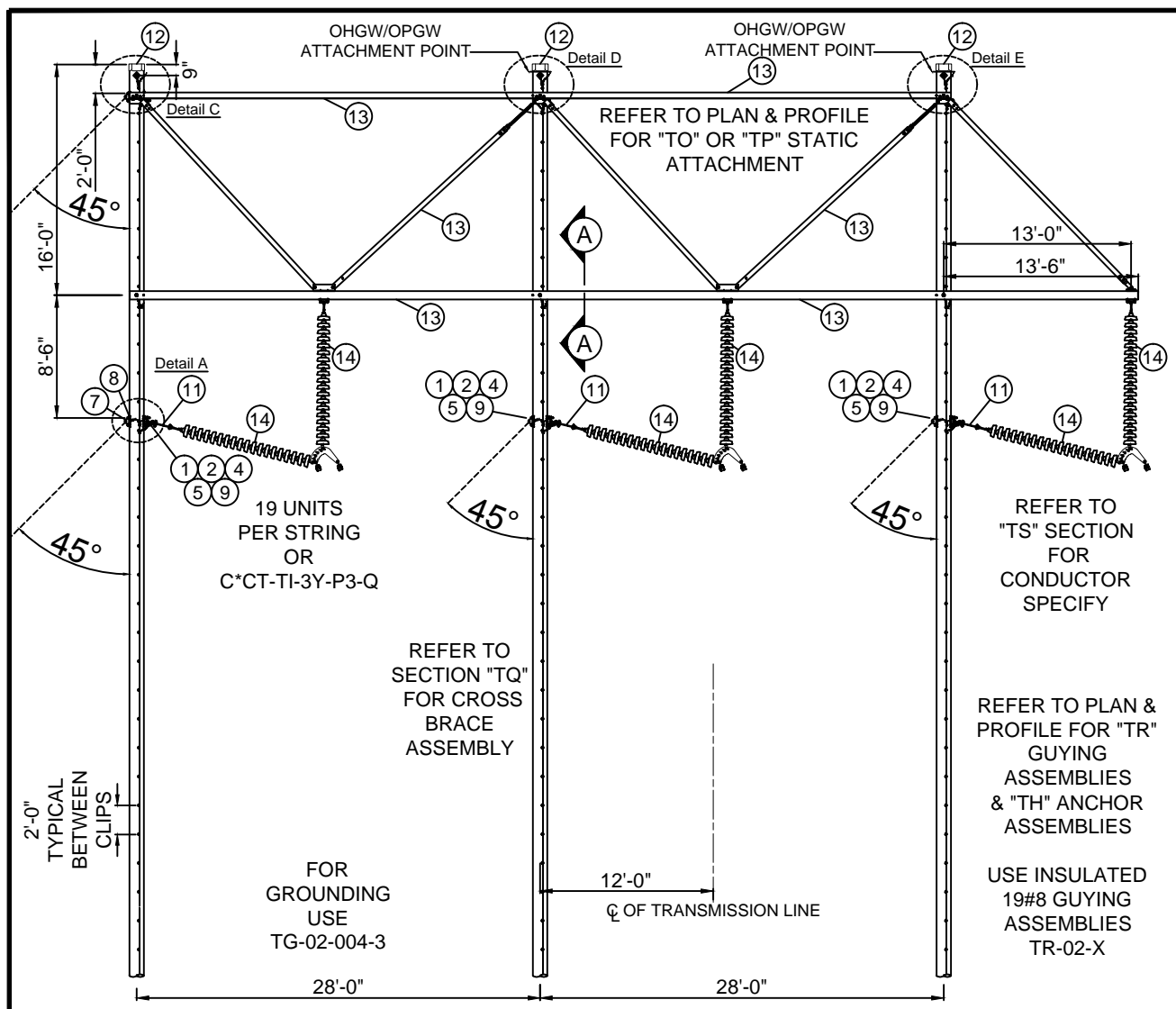
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NOTE G: REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.

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Contact Engineering Standards - Transmission Section for the creation of new standards and CUs. Drawing Scale: 1" = 12'

	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - WOOD 345KV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR H-FRAME RUNNING ANGLE - 3° TO 10° SINGLE STEEL CROSSARM TYPE EBR-2	REVISION
			00
Drwn. By: B. Franklin	Date Dr.: 2/15/2013	Checked By: Becken/Hart	Date Ck.: 3/18/2015
Approved By: Barry R. Hart	Date App.: 5/20/2015	TM2.23.TN-3IA7B-X	
			Sheet 1



BILL OF MATERIAL (Type of CU: POLE)				
CU: C*PT-TN-3IA8B				
ITEM NO.	QTY.	UOM	IUSA MID	
1	15	EA	1000910800	NUT LCK MF SQ 7/8" BOLT GALV
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6	8	EA	6000274880	WASHER 4" SQ CURVED (7/8")
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8	7	EA	6000273231	GAIN GRID, 4-1/2" X 9", BONDING F/ 7/8 BOLTS
9	7	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
10	23	EA	6000113712	WISE, PAR GROOVE GRND CNCTR BRZ, NO. 2 AWG CWLD
11	3	EA	6000273421	EXTENSION STRAP, GALV., 2-1/2 X 12, 40K
12	3	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: XARM)				
CU: C*PT-TT-3S-A-FC70				
ITEM NO.	QTY.	UOM	IUSA MID	
13	1 CU	EA	1036235455	SINGLE CROSSARM, STEEL, 7" X 7" X 70"

BILL OF MATERIAL (Type of CU: INSO)				
CU: C*CT-TI-9P-D5-19				
ITEM NO.	QTY.	UOM	IUSA MID	
14	3 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (19 UNITS/STRING)

CU: C*CT-TI-3Y-P3-Q				
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USE THE MACRO CUs INSTEAD OF INDIVIDUAL CU COMPONENTS FOR EASE OF WORK ORDER ENTRY.

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN3IA8B-K2H2	(6) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S2A2W1-K	(2) TP-W-TS-G-H
C*M-TN3IA8B-K2HO	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2W1-K	TP-W-TS-G-H TO-W-TS-G-O
C*M-TN3IA8B-K2HS	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2W1-K	TP-W-TS-G-H TO-W-TS-G-S
C*M-TN3IA8B-L2H2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2W1-L	(2) TP-W-TS-G-H
C*M-TN3IA8B-L2HO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2W1-L	TP-W-TS-G-H TO-W-TS-G-O
C*M-TN3IA8B-L2HS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2W1-L	TP-W-TS-G-H TO-W-TS-G-S

CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (*).

NOTE A: OTHER STANDARD DRAWINGS REQUIRED:

- TD FOUNDATION & BACKFILL
- TG GROUND WIRE & GROUND ROD DETAIL
- TK MARKINGS
- TH GUYING ASSEMBLIES
- TR GUY ANCHORS

NOTE B: POLE DRILLING:

- 7/8" BOLT - 15/16" DIAMETER HOLE
- 1" BOLT - 1-1/16" DIAMETER HOLE
- 1-1/4" BOLT - 1-5/16" DIAMETER HOLE

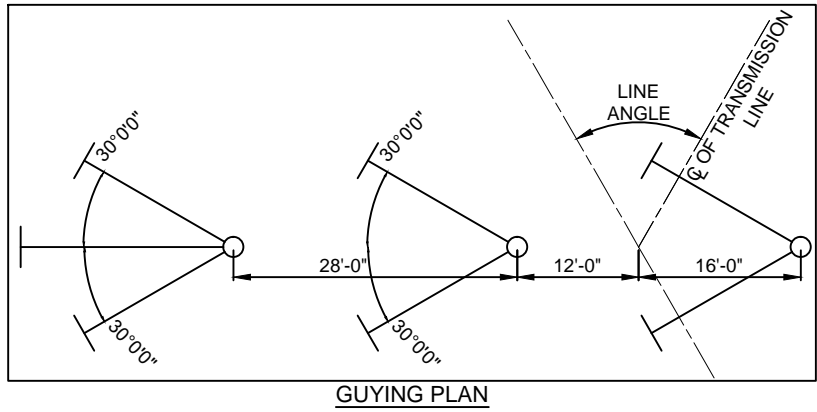
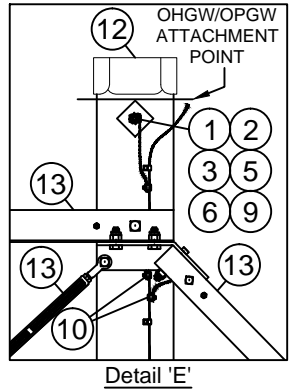
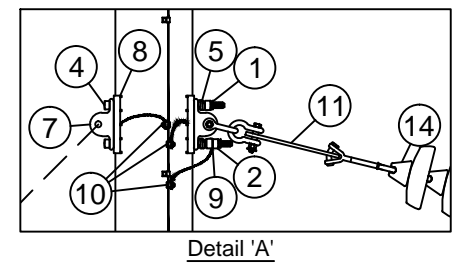
NOTE C: TO SEAT SPIKE GRIDS ASSEMBLE ARMS, BRACES AND OTHER REQUIRED HARDWARE. HAND TIGHTEN TO ENSURE FIT. USE HYDRAULIC TOOLS TO SEAT GRIDS PROPERLY.

NOTE D: STRUCTURES USING 100' LONG POLES OR LONGER REQUIRE (2) CROSS BRACES, REFER TO SECTION TQ FOR ADDITIONAL CROSS BRACE ASSEMBLY.

NOTE E: LARGER OR SMALLER BOLTS MAY BE REQUIRED DEPENDING ON THE DIAMETER OF THE POLE USED. SUBSTITUTE MATERIAL ID (MID) ON THE WORK ORDER COMPONENTS PAGE FOR THE LENGTH NEEDED IF DIFFERENT THAN THE GENERIC LENGTH SHOWN IN THE BILL OF MATERIALS. CONTACT ENGINEERING STANDARDS - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

NOTE F: GUYING ANGLES SHOWN ARE GUIDELINES. IF THE SPECIFIC FIELD CONDITIONS IN THE AREA WHERE THIS STRUCTURE IS INSTALLED DO NOT ACCOMMODATE THIS GUYING ARRANGEMENT THEN THE CHANGES TO THE GUYING ARRANGEMENT SHALL BE NOTED ON THE RESPECTIVE PLAN AND PROFILE DRAWING.

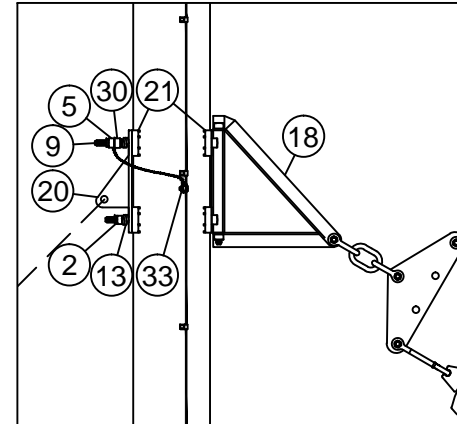
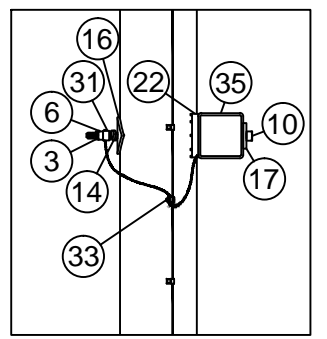
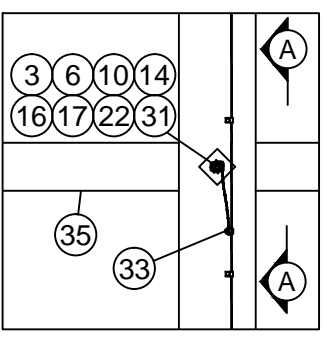
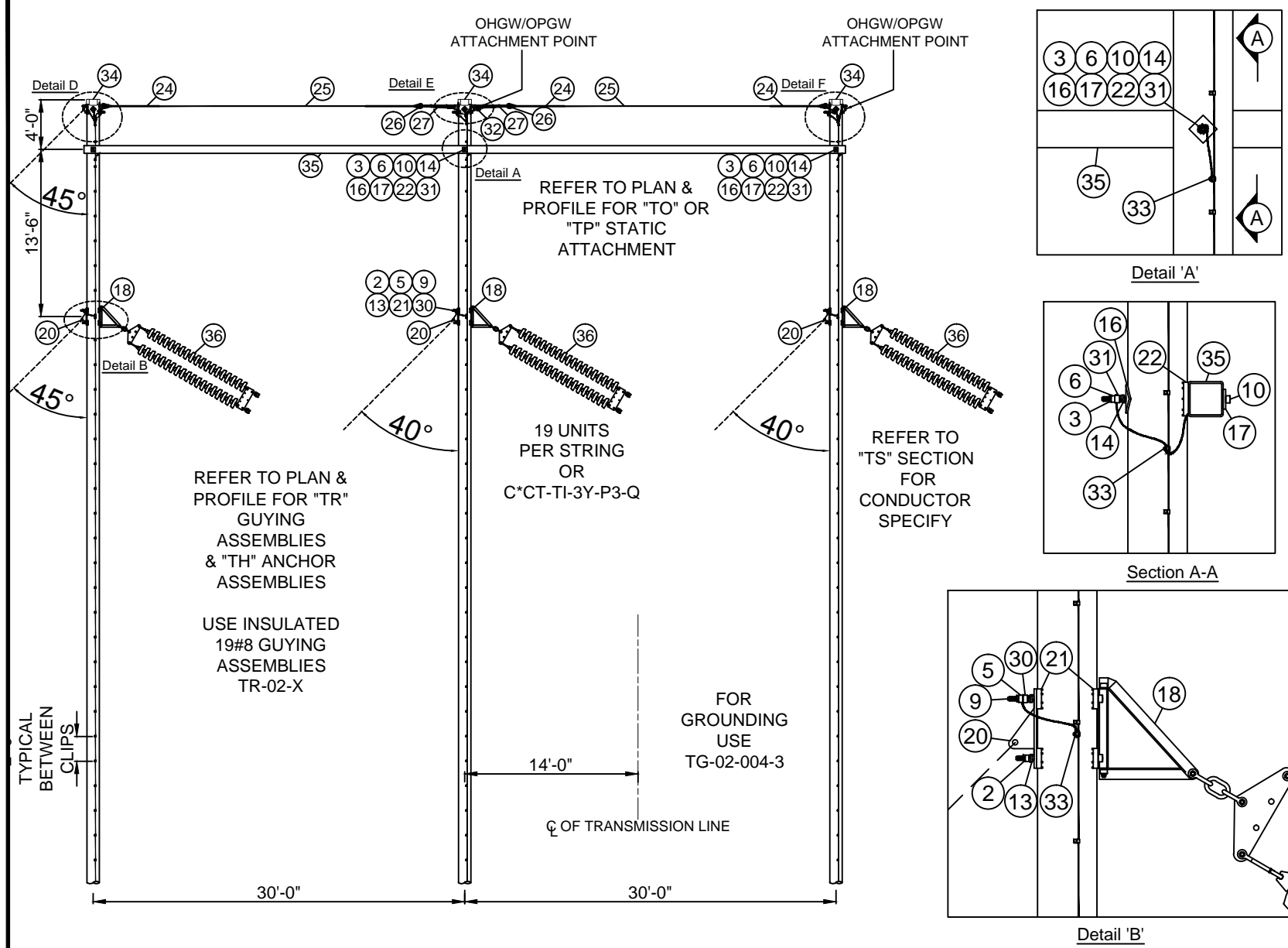
NOTE G: REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.



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Contact Engineering Standards - Transmission Section for the creation of new standards and CUs. Drawing Scale: 1" = 12'

	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - WOOD 345KV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR H-FRAME RUNNING ANGLE - 10° TO 20° SINGLE STEEL CROSSARM TYPE EBR-2	REVISION
			00
Drwn. By: B. Franklin	Date Dr.: 2/15/2013	Checked By: Becken/Hart	Date Ck.: 3/18/2015
Approved By: Barry R. Hart	Date App.: 5/20/2015	TM2.23.TN-3IA8B-X	
			Sheet 1



BILL OF MATERIAL (Type of CU: POLE)				
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-3IA9B
1	9	EA	1000910800	NUT LCK MF SQ 7/8" BOLT GALV
2	9	EA	1000910900	NUT LCK MF SQ 1" BOLT GALV
3	3	EA	1000911000	NUT LCK MF SQ 1-1/4" BOLT GALV
4	6	EA	6000273770	NUT SQ 7/8" BOLT GALV
5	3	EA	1000912000	NUT SQ 1" BOLT GALV
6	3	EA	6000273782	NUT SQ 1-1/4" BOLT GALV
7	3	EA	1035475014	BOLT SQ HEAD 7/8 X 14 W/ SQ NUT (NOTE D)
8	6	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE D)
9	6	EA	1035476024	BOLT SQ HEAD 1 X 24 W/ SQ NUT (NOTE D)
10	3	EA	6000272050	BOLT SQ HEAD 1-1/4 X 28 W/ SQ NUT (NOTE D)
11	4	EA	6000272300	BOLT DRILLED, GALV., 7/8 X 4-3/4 W/SN & COTTER PIN
12	13	EA	6000274612	WASHER HELICAL (7/8")
13	6	EA	6000274614	WASHER HELICAL (1")
14	3	EA	6000274618	WASHER HELICAL (1 1/4")
15	12	EA	6000274880	WASHER 4" SQ CURVED (7/8")
16	3	EA	6000274894	WASHER 4" X 9" RECT CURVED (1 1/4")
17	3	EA	6000274846	WASHER 4" SQ FLAT (1 1/4")
18	3	EA	6000250718	BRACKET SWINGING ANGLE, 40K, INC. U-PLATE, BOLT & LOCKNUT
19	3	EA	6000274505	DEAD END TEE, 60K
20	3	EA	6000274507	HEAVY GUYING TEE, 70K
21	12	EA	6000273255	GAIN GRID, 4" X 6-3/4", BONDING F/ 1" BOLTS
22	3	EA	6000273265	GAIN GRID, XARM BONDING F/ 1-1/4" BOLTS
23	3	EA	6000273231	GAIN GRID, 4-1/2" X 9", BONDING F/ 7/8 BOLTS
24	4	EA	1005259000	GRIP PRFRMD GUY 19#8 AWLD
25	80	FT	6000252362	WIRE ALWD GUY 19#8
26	4	EA	1010145562	THMBL ROLLER 3-1/4" DIA 1-1/16" H
27	2	EA	6000274527	TURNBUCKLE, 7/8 X 27 (+/- 6 IN), JAW-ROD, 30K
28	4	EA	6000272872	CLEVIS, DEADEND, 6-3/4 IN LENGTH, 25K
29	6	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
30	3	EA	1036200008	CLMP GRND WIRE U-CLIP 1-1/16" H
31	3	EA	6000251024	CLMP GRND WIRE U-CLIP 1-5/16" H
32	4	EA	6000113887	CONN COMP #2 SOL - 19#8 AWLD
33	17	EA	6000113712	WISE, PAR GROOVE GRND CNCTR BRZ, NO. 2 AWG CWLD
34	3	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: XARM)				
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TT-3S-B-FC61
35	1 CU	EA	6000740821	SINGLE CROSSARM, STEEL, 7" X 7" X 61' 6"

BILL OF MATERIAL (Type of CU: INSO)				
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-19
36	3 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (19 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-3Y-P3-Q
36	3	EA	6000313012	INS POLY Y-BALL 30K 19 UNIT EQ. W/COR RING

CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (C*_).

- NOTE A: OTHER STANDARD DRAWINGS REQUIRED:
- TD FOUNDATION & BACKFILL
 - TG GROUND WIRE & GROUND ROD DETAIL
 - TK MARKINGS
 - TH GUYING ASSEMBLIES
 - TR GUY ANCHORS

NOTE B: POLE DRILLING: 7/8" BOLT - 15/16" DIAMETER HOLE
 1" BOLT - 1-1/16" DIAMETER HOLE
 1-1/4" BOLT - 1-5/16" DIAMETER HOLE

NOTE C: TO SEAT SPIKE GRIDS ASSEMBLE ARMS, BRACES AND OTHER REQUIRED HARDWARE. HAND TIGHTEN TO ENSURE FIT. USE HYDRAULIC TOOLS TO SEAT GRIDS PROPERLY.

NOTE D: LARGER OR SMALLER BOLTS MAY BE REQUIRED DEPENDING ON THE DIAMETER OF THE POLE USED. SUBSTITUTE MATERIAL ID (MID) ON THE WORK ORDER COMPONENTS PAGE FOR THE LENGTH NEEDED IF DIFFERENT THAN THE GENERIC LENGTH SHOWN IN THE BILL OF MATERIALS. CONTACT SYSTEM ENGINEERING - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

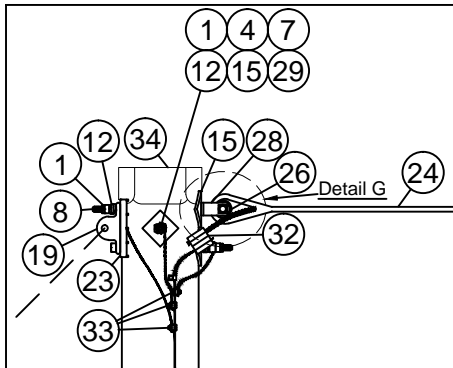
NOTE E: GUYING ANGLES SHOWN ARE GUIDELINES. IF THE SPECIFIC FIELD CONDITIONS IN THE AREA WHERE THIS STRUCTURE IS INSTALLED DO NOT ACCOMMODATE THIS GUYING ARRANGEMENT THEN THE CHANGES TO THE GUYING ARRANGEMENT SHALL BE NOTED ON THE RESPECTIVE PLAN AND PROFILE DRAWING.

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

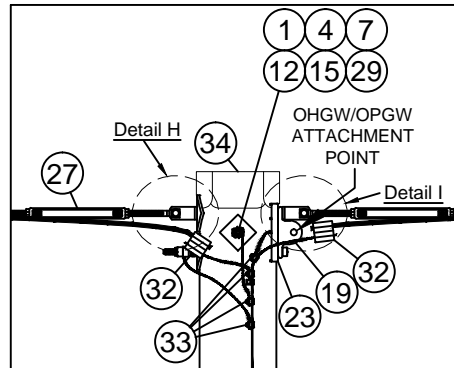
Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.			Drawing Scale: 1" = 12'	
	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - WOOD	345kv H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR H-FRAME RUNNING ANGLE - 20° TO 30° STEEL CROSSARM TYPE ECR-1	
	Drwn. By: B. Franklin Date Dr.: 2/15/2013	Checked By: Becken/Hart	Date Ck.: 3/18/2015	Approved By: Barry R. Hart Date App.: 5/20/2015
TM2.23.TN-3IA9B-X				REVISION 00 DATE 5/21/2015 Sheet 1

USE THE MACRO CUs INSTEAD OF INDIVIDUAL CU COMPONENTS FOR EASE OF WORK ORDER ENTRY.

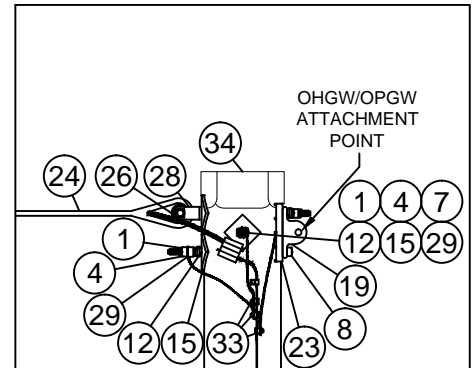
CU MACRO	CONDUCTOR	1ST STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN3IA9B-K2H2	(6) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S2A2D1-K	(2) TP-W-A1-G-H
C*M-TN3IA9B-K2HO	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2D1-K	TP-W-A1-G-H TO-W-A1-G-O
C*M-TN3IA9B-K2HS	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2D1-K	TP-W-A1-G-H TO-W-A1-G-S
C*M-TN3IA9B-L2H2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2D1-L	(2) TP-W-A1-G-H
C*M-TN3IA9B-L2HO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2D1-L	TP-W-A1-G-H TO-W-A1-G-O
C*M-TN3IA9B-L2HS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2D1-L	TP-W-A1-G-H TO-W-A1-G-S



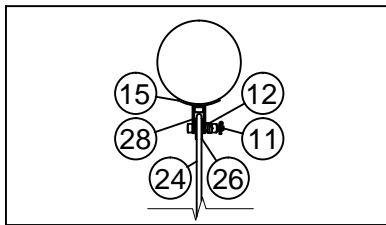
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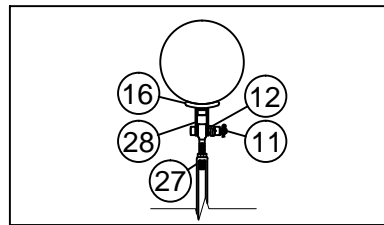
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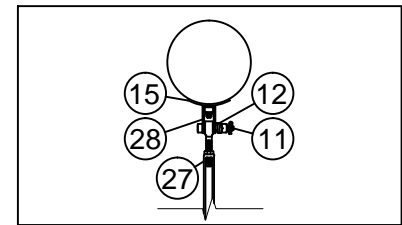
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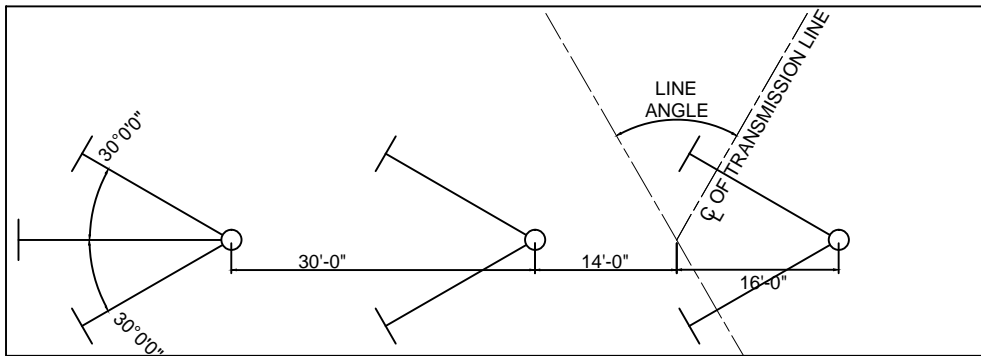
Detail 'G'



Detail 'H'



Detail 'I'



GUYING PLAN

CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (C*_).

REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.

Drawing Scale: N/A



TRANSMISSION
CONSTRUCTION
STANDARDS
MANUAL

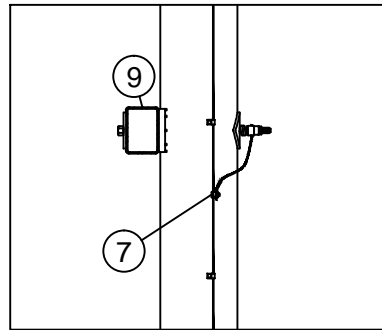
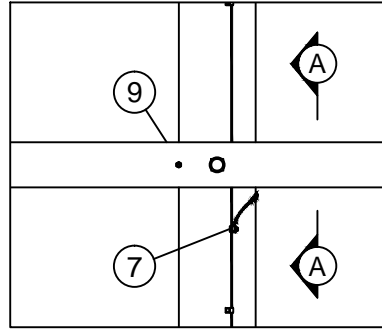
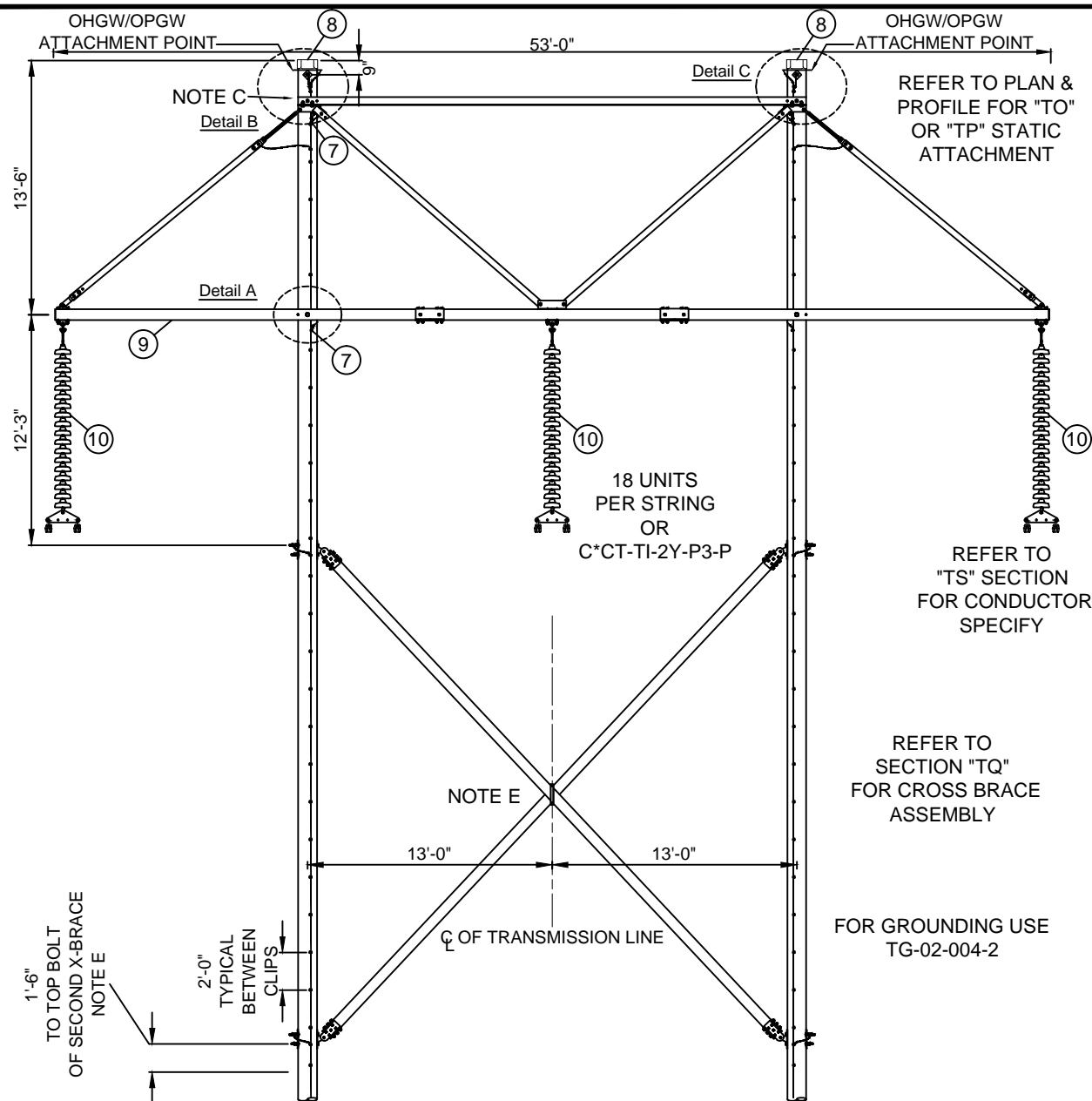
STRUCTURE STANDARDS - WOOD
345kV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR
H-FRAME RUNNING ANGLE - 20° TO 30° STEEL CROSSARM
TYPE ECR-1

REVISION
00
DATE
5/21/2015

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
B. Franklin	2/15/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015

TM2.23.TN-3IA9B-X

Sheet 2



CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (C*_).

NOTE A: OTHER STANDARD DRAWINGS REQUIRED:
 TD FOUNDATION & BACKFILL
 TG GROUND WIRE & GROUND ROD DETAIL
 TK MARKINGS

NOTE B: POLE DRILLING: 7/8" BOLT - 15/16" DIAMETER HOLE
 X-ARM BOLT - 1 5/16" DIAMETER HOLE

NOTE C: TO LOCATE THIS HOLE ASSEMBLE CROSSARM, BRACES AND ASSOCIATED HARDWARE POSITION BRACES AGAINST POLE AND MARK POLE FOR DRILLING AT HOLES IN DEAD END TEE AND HOLE IN END PLATE.

NOTE D: TO SEAT SPIKE GRIDS ASSEMBLE ARMS, BRACES AND OTHER REQUIRED HARDWARE. HAND TIGHTEN TO ENSURE FIT. USE HYDRAULIC TOOLS TO SEAT GRIDS PROPERLY.

NOTE E: STRUCTURES USING 100' LONG POLES OR LONGER REQUIRE (2) CROSS BRACES, REFER TO SECTION TQ FOR ADDITIONAL CROSS BRACE ASSEMBLY.

NOTE F: LARGER OR SMALLER BOLTS MAY BE REQUIRED DEPENDING ON THE DIAMETER OF THE POLE USED. SUBSTITUTE MATERIAL ID (MID) ON THE WORK ORDER COMPONENTS PAGE FOR THE LENGTH NEEDED IF DIFFERENT THAN THE GENERIC LENGTH SHOWN IN THE BILL OF MATERIALS. CONTACT ENGINEERING STANDARDS - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

NOTE G: MOUNTING BOLTS, NUTS, WASHERS, GAINS, BONDING HARDWARE, BRACES AND CROSS-TIE ARE PROVIDED IN THE CROSSARM CU.

NOTE H: REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.

BILL OF MATERIAL (Type of CU: POLE)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-3IHTB
1	2	EA	1000910800	NUT LCK MF SQ 7/8" BOLT GALV
2	2	EA	6000273770	NUT SQ 7/8" BOLT GALV
3	2	EA	1035475014	BOLT SQ HEAD 7/8 X 14 W/ SQ NUT (NOTE F)
4	2	EA	6000274612	WASHER HELICAL (7/8")
5	4	EA	6000274880	WASHER 4" SQ CURVED (7/8")
6	2	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
7	10	EA	6000113712	WISE, PAR GROOVE GRND CNCTR BRZ, NO. 2 AWG CWLD
8	2	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: XARM)

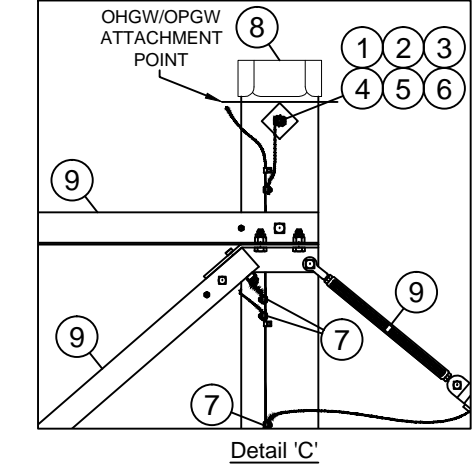
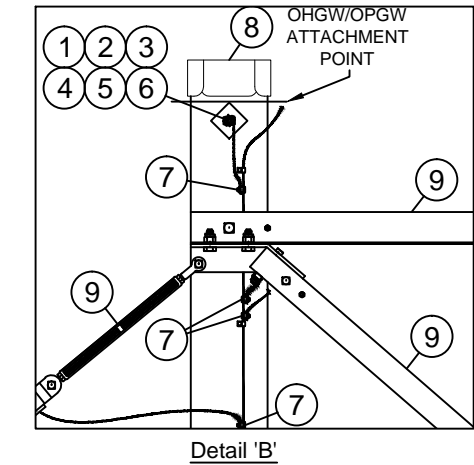
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TT-3S-A-FC53
9	1 CU	EA	1036235452	SINGLE CROSSARM, STEEL, 7" X 7" X 53"

BILL OF MATERIAL (Type of CU: INSO)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-18
10	3 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (18 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-P
10	3	EA	6000313011	INS POLY Y-BALL 30K 18 UNIT EQ. W/COR RING

USE THE MACRO CUs INSTEAD OF INDIVIDUAL CU COMPONENTS FOR EASE OF WORK ORDER ENTRY.

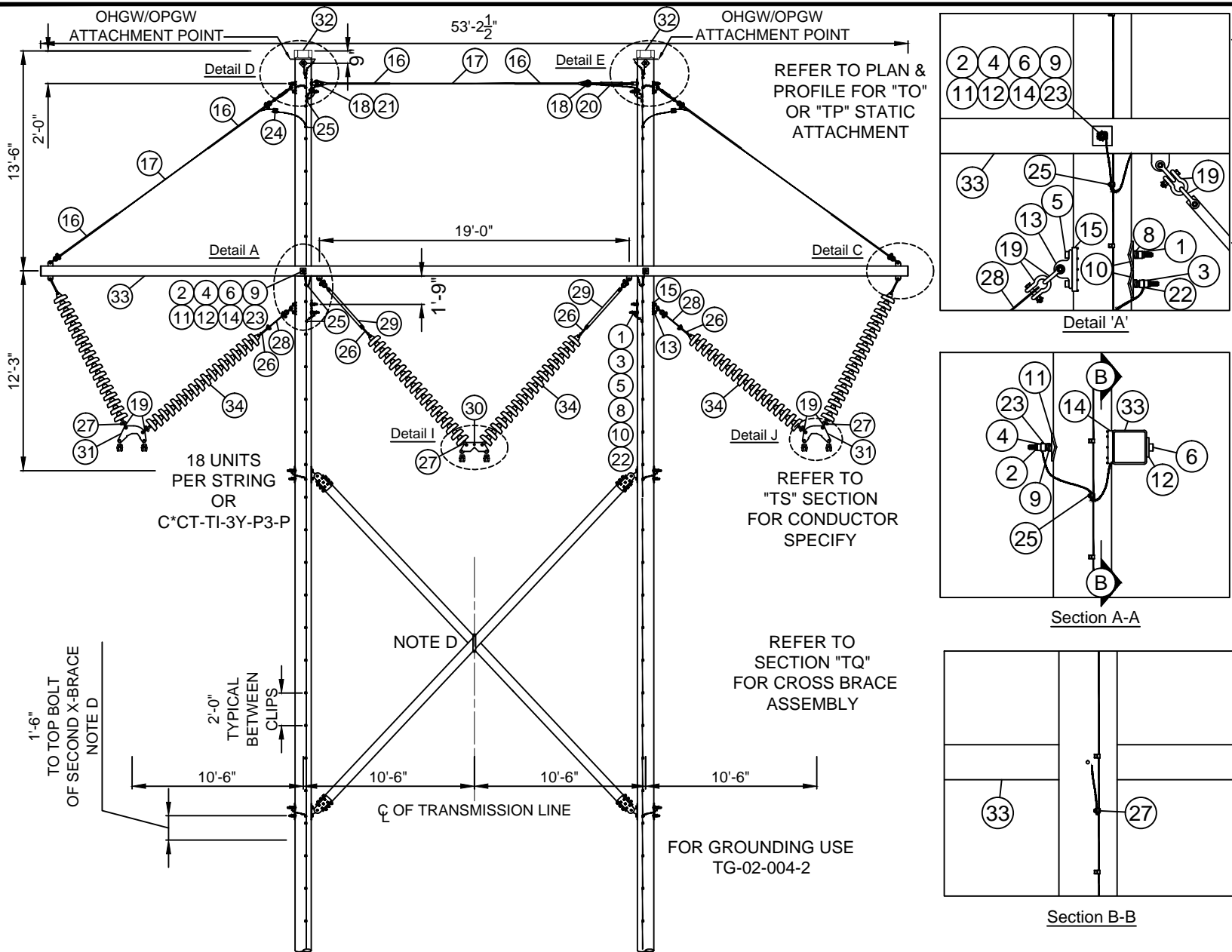
CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN3IHTB-K2H2	(6) - 1192 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2Y1-K	(2) TP-W-XX-H
C*M-TN3IHTB-K2HO	(6) - 1192 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2Y1-K	TP-W-XX-H TO-W-XX-O
C*M-TN3IHTB-K2HS	(6) - 1192 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2Y1-K	TP-W-XX-H TO-W-XX-S
C*M-TN3IHTB-L2H2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2Y1-L	(2) TP-W-XX-H
C*M-TN3IHTB-L2HO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2Y1-L	TP-W-XX-H TO-W-XX-O
C*M-TN3IHTB-L2HS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2Y1-L	TP-W-XX-H TO-W-XX-S



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Contact Engineering Standards - Transmission Section for the creation of new standards and CUs. Drawing Scale: 1" = 10'

	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - WOOD 345KV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR TANGENT H-FRAME - SINGLE STEEL CROSSARM TYPE EAR-1	REVISION
			00
			DATE
			5/21/2015
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:
B. Franklin	2/15/2013	Becken/Hart	3/18/2015
Approved By:	Date App.:	TM2.23.TN-3IHTB-X	
Barry R. Hart	5/20/2015	Sheet 1	



CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (*).

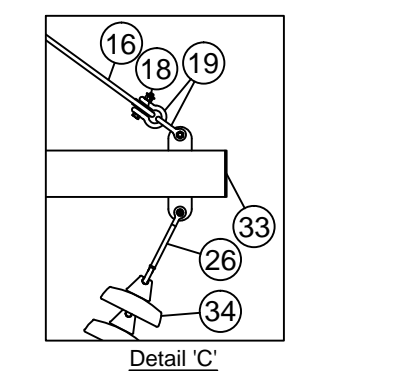
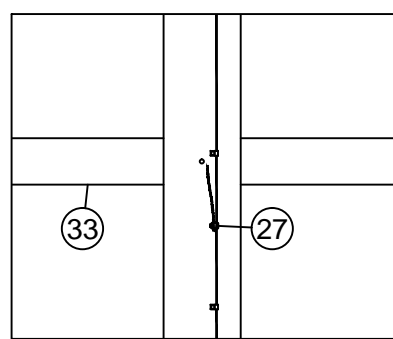
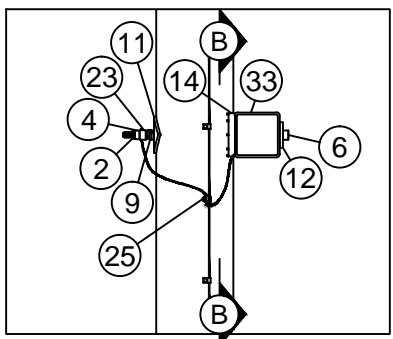
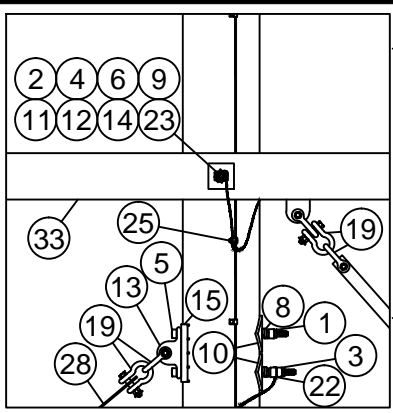
NOTE A: OTHER STANDARD DRAWINGS REQUIRED:
 TD FOUNDATION & BACKFILL
 TG GROUND WIRE & GROUND ROD DETAIL
 TK MARKINGS

NOTE B: POLE DRILLING: 7/8" BOLT - 15/16" DIAMETER HOLE
 1" BOLT - 1 1/16" DIAMETER HOLE
 1-1/4" BOLT - 1 5/16" DIAMETER HOLE

NOTE C: TO SEAT SPIKE GRIDS ASSEMBLE ARMS, BRACES AND OTHER REQUIRED HARDWARE. HAND TIGHTEN TO ENSURE FIT. USE HYDRAULIC TOOLS TO SEAT GRIDS PROPERLY.

NOTE D: STRUCTURES USING 100' LONG POLES OR LONGER REQUIRE (2) CROSS BRACES, REFER TO SECTION TQ FOR ADDITIONAL CROSS BRACE ASSEMBLY.

NOTE E: LARGER OR SMALLER BOLTS MAY BE REQUIRED DEPENDING ON THE DIAMETER OF THE POLE USED. SUBSTITUTE MATERIAL ID (MID) ON THE WORK ORDER COMPONENTS PAGE FOR THE LENGTH NEEDED IF DIFFERENT THAN THE GENERIC LENGTH SHOWN IN THE BILL OF MATERIALS. CONTACT ENGINEERING STANDARDS - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.



BILL OF MATERIAL (Type of CU: POLE)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-3IHWB
1	10	EA	1000910800	NUT LCK MF SQ 7/8" BOLT GALV
2	2	EA	1000911000	NUT LCK MF SQ 1 1/4" BOLT GALV
3	8	EA	6000273770	NUT SQ 7/8" BOLT GALV
4	2	EA	6000273782	NUT SQ 1 1/4" BOLT GALV
5	10	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE E)
6	2	EA	1035476024	BOLT SQ HEAD 1-1/4 X 28 W/ SQ NUT (NOTE E)
7	2	EA	6000272300	BOLT DRILLED, GALV., 7/8 X 4-3/4 W/SN & COTTER PIN
8	12	EA	6000274612	WASHER HELICAL (7/8")
9	2	EA	6000274618	WASHER HELICAL (1 1/4")
10	18	EA	6000274880	WASHER 4" SQ CURVED (7/8")
11	2	EA	6000274894	WASHER 4" x 9" RECT CURVED (1-1/4")
12	2	EA	6000274846	WASHER 4" SQ FLAT (1 1/4")
13	4	EA	6000274505	DEAD END TEE, 60K
14	2	EA	6000273265	GAIN GRID, XARM BONDING F/ 1-1/4" BOLTS
15	4	EA	6000273231	GAIN GRID, 4-1/2" X 9", BONDING F/ 7/8 BOLTS
16	6	EA	1005259000	GRIP PRFRMD GUY 19#8 AWLD
17	80	FT	6000252362	WIRE ALWD GUY 19#8
18	6	EA	1010145562	THMBL ROLLER 3-1/4" DIA 1-1/16" H
19	20	EA	1039220531	SHCKL ANCH 7/8 BNK 1-1/4 OPNG
20	3	EA	6000274527	TURNBUCKLE, 7/8 X 27 (+/- 6 IN), JAW-ROD, 30K
21	2	EA	6000272872	CLEVIS, DEADEND, 6-3/4 IN LENGTH, 25K
22	8	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
23	2	EA	6000251024	CLMP GRND WIRE U-CLIP 1-5/16" H
24	4	EA	6000113887	CONN COMP #2 SOL - 19#8 AWLD
25	14	EA	6000113712	WISE, PAR GROOVE GRND CNCTR BRZ, NO. 2 AWG CWLD
26	6	EA	6000273160	FITTING CLV-Y BALL 30K 3/4" BNK
27	6	EA	6000272900	FITTING CLV-Y SCKT 30K SM NHL 3/4" BNK
28	2	EA	6000273425	EXTENSION STRAP, GALV., 2-1/2 X 14, 40K
29	2	EA	6000273426	EXTENSION STRAP, GALV., 2-1/2 X 36, 40K
30	1	EA	6000274145	PLATE YOKE, GALV., VEE, TANGENT, 40K
31	2	EA	6000274146	PLATE YOKE, GALV., VEE, CRESCENT TANGENT, 30K
32	2	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: XARM)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TT-3S-G-FC89
33	1 CU	EA	6000740823	SINGLE CROSSARM, STEEL, 7" X 7" X 53' 2-1/2"

BILL OF MATERIAL (Type of CU: INSO)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-18
34	3 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (18 UNITS/STRING)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-P
34	3 CUs	EA	6000313011	INS POLY Y BALL 30K 18 UNIT EQ. W/COR RING

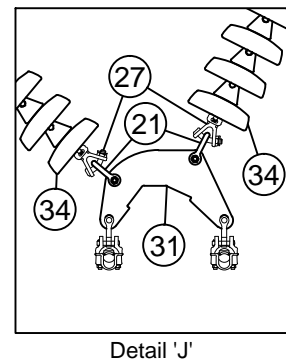
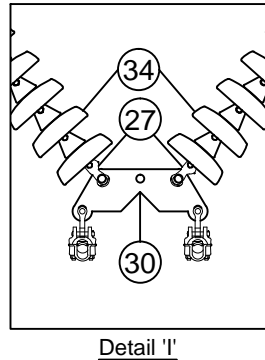
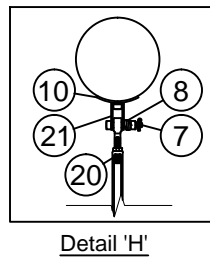
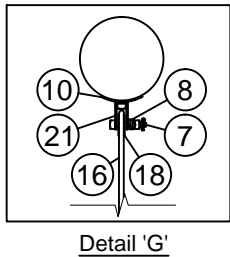
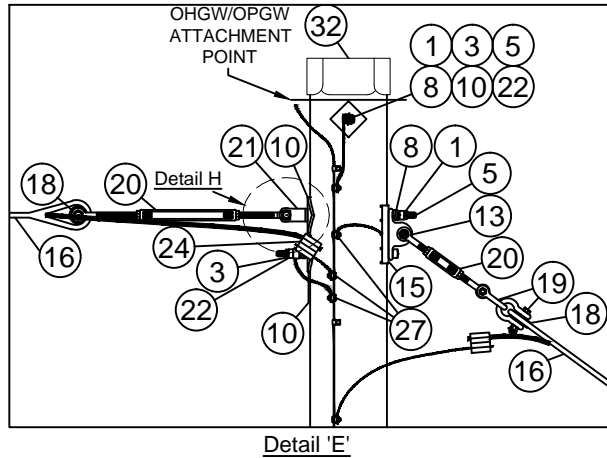
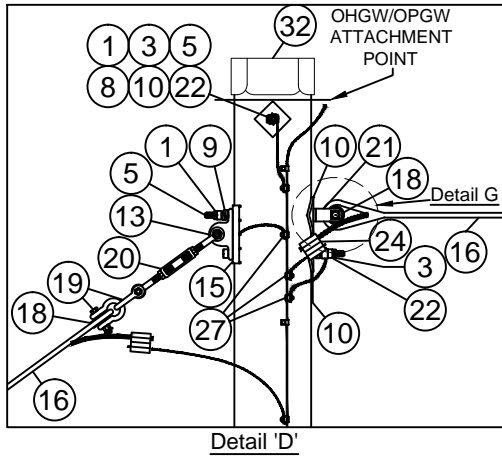
THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

Contact Engineering Standards - Transmission Section for the creation of new standards and CUs. Drawing Scale: 1" = 10'

	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - WOOD	REVISION
		345KV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR TANGENT H-FRAME - VEE STRING INSULATORS SINGLE STEEL CROSSARM TYPE EAR-3	00 DATE 5/21/2015
Drwn. By: B. Franklin	Date Dr.: 8/21/2013	Checked By: Becken/Hart	Date Ck.: 3/18/2015
		Approved By: Barry R. Hart	Date App.: 5/20/2015
TM2.23.TN-3IHWB-X			Sheet 1

USE THE MACRO CUs INSTEAD OF INDIVIDUAL CU COMPONENTS FOR EASE OF WORK ORDER ENTRY.

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN3IHWB-K2H2	(6) - 1192 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2-K	(2) TP-W-XX-H
C*M-TN3IHWB-K2HO	(6) - 1192 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2-K	TP-W-XX-H TO-W-XX-O
C*M-TN3IHWB-K2HS	(6) - 1192 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2-K	TP-W-XX-H TO-W-XX-S
C*M-TN3IHWB-L2H2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2-L	(2) TP-W-XX-H
C*M-TN3IHWB-L2HO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2-L	TP-W-XX-H TO-W-XX-O
C*M-TN3IHWB-L2HS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2-L	TP-W-XX-H TO-W-XX-S



CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (C*_).

REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.

Drawing Scale: N/A



TRANSMISSION
CONSTRUCTION
STANDARDS
MANUAL

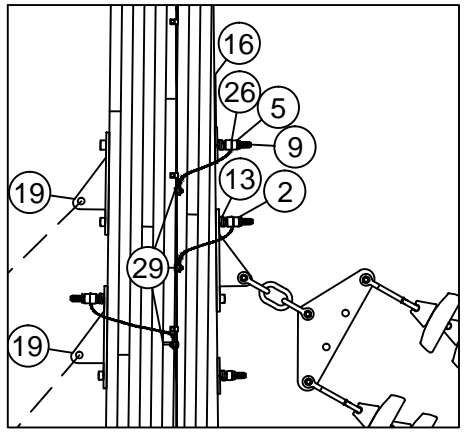
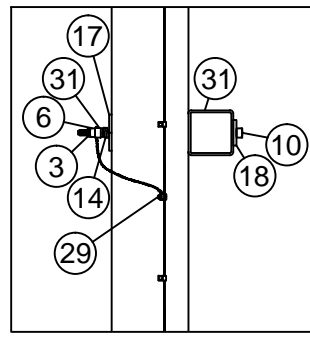
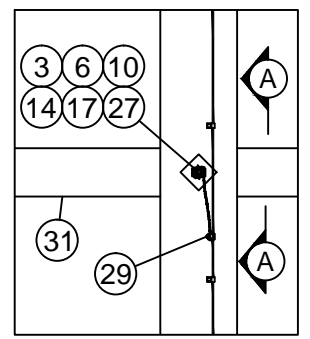
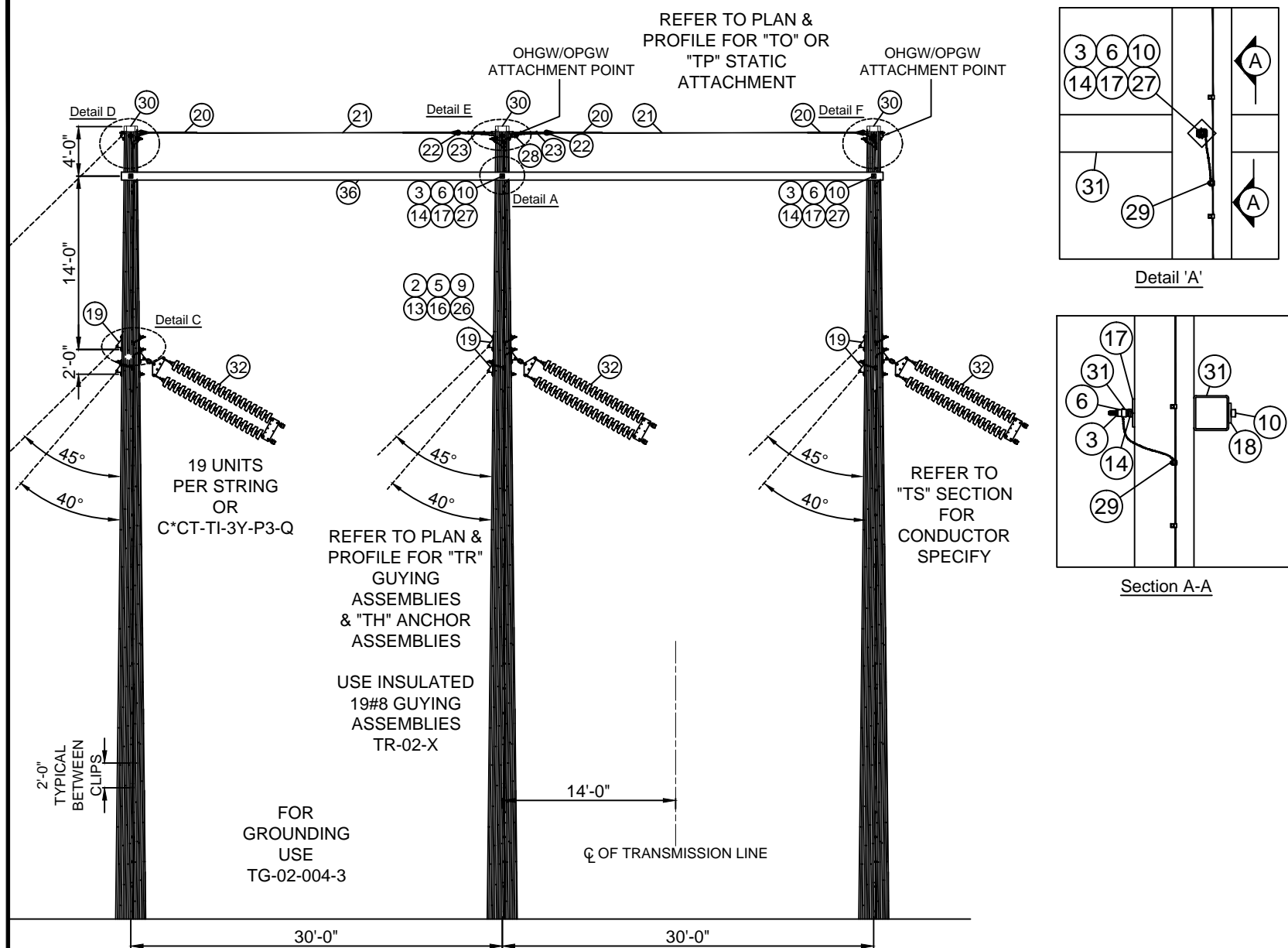
STRUCTURE STANDARDS - WOOD
345kV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR
TANGENT H-FRAME - VEE STRING INSULATORS SINGLE STEEL CROSSARM
TYPE EAR-3

REVISION
00
DATE
5/21/2015

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
B. Franklin	8/21/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015

TM2.23.TN-3IHWB-X

Sheet 2



BILL OF MATERIAL (Type of CU: POLE)

CU: C*PT-TN-3KA0B				
ITEM NO.	QTY.	UOM	IUSA MID	
1	9	EA	1000910800	NUT LCK MF SQ 7/8" BOLT GALV
2	12	EA	1000910900	NUT LCK MF SQ 1" BOLT GALV
3	3	EA	1000911000	NUT LCK MF SQ 1 1/4" BOLT GALV
4	6	EA	6000273770	NUT SQ 7/8" BOLT GALV
5	9	EA	1000912000	NUT SQ 1" BOLT GALV
6	3	EA	6000273782	NUT SQ 1-1/4" BOLT GALV
7	3	EA	1035475014	BOLT SQ HEAD 7/8 X 14 W/ SQ NUT (NOTE C)
8	6	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE C)
9	12	EA	1035476024	BOLT SQ HEAD 1 X 24 W/ SQ NUT (NOTE C)
10	3	EA	6000272050	BOLT SQ HEAD 1-1/4 X 28 W/ SQ NUT (NOTE C)
11	4	EA	6000272300	BOLT DRILLED, GALV., 7/8 X 4-3/4 W/SN & COTTER PIN
12	13	EA	6000274612	WASHER HELICAL (7/8")
13	12	EA	6000274614	WASHER HELICAL (1")
14	3	EA	6000274618	WASHER HELICAL (1 1/4")
15	12	EA	1000946500	WASHER 4" SQ FLAT (7/8")
16	6	EA	6000274844	WASHER 4" SQ FLAT (1")
17	6	EA	6000274846	WASHER 4" SQ FLAT (1 1/4")
18	3	EA	6000274505	DEAD END TEE, 60K
19	9	EA	6000274507	HEAVY GUYING TEE, 70K
20	4	EA	1005259000	GRIP PRFRMD GUY 19#8 AWLD
21	80	FT	6000252362	WIRE ALWD GUY 19#8
22	4	EA	1010145562	THMBL ROLLER 3-1/4" DIA 1-1/16" H
23	2	EA	6000274527	TURNBUCKLE, 7/8 X 27 (+/- 6 IN), JAW-EYE, 30K
24	4	EA	6000272872	CLEVIS, DEADEND, 6-3/4 IN LENGTH, 25K
25	6	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
26	9	EA	1036200008	CLMP GRND WIRE U-CLIP 1-1/16" H
27	3	EA	6000251024	CLMP GRND WIRE U-CLIP 1-5/16" H
28	4	EA	6000113887	CONN COMP #2 SOL - 19#8 AWLD
29	23	EA	6000113712	WISE, PAR GROOVE GRND CNCTR BRZ, NO. 2 AWG CWLD
30	3	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: XARM)

CU: C*PT-TT-3S-B-FC61				
ITEM NO.	QTY.	UOM	IUSA MID	
31	1 CU	EA	6000740821	SINGLE CROSSARM, STEEL, 7" X 7" X 61' 6"

BILL OF MATERIAL (Type of CU: INSO)

CU: C*CT-TI-9P-D5-19				
ITEM NO.	QTY.	UOM	IUSA MID	
32	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (19 UNITS/STRING)

CU: C*CT-TI-3Y-P3-Q				
ITEM NO.	QTY.	UOM	IUSA MID	
32	6	EA	6000313012	INS POLY Y-BALL 30K 19 UNIT EQ. W/COR RING

CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (C*).

- NOTE A: OTHER STANDARD DRAWINGS REQUIRED:
- TD FOUNDATION & BACKFILL
 - TG GROUND WIRE & GROUND ROD DETAIL
 - TK MARKINGS
 - TH GUYING ASSEMBLIES
 - TR GUY ANCHORS

NOTE B: POLE DRILLING: 7/8" BOLT - 15/16" DIAMETER HOLE
 1" BOLT - 1-1/16" DIAMETER HOLE
 1-1/4" BOLT - 1-5/16" DIAMETER HOLE

NOTE C: LARGER OR SMALLER BOLTS MAY BE REQUIRED DEPENDING ON THE DIAMETER OF THE POLE USED. SUBSTITUTE MATERIAL ID (MID) ON THE WORK ORDER COMPONENTS PAGE FOR THE LENGTH NEEDED IF DIFFERENT THAN THE GENERIC LENGTH SHOWN IN THE BILL OF MATERIALS. CONTACT ENGINEERING STANDARDS - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

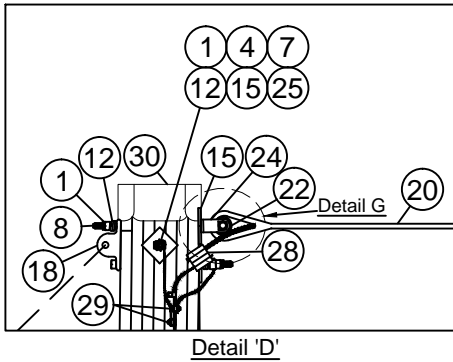
NOTE D: GUYING ANGLES SHOWN ARE GUIDELINES. IF THE SPECIFIC FIELD CONDITIONS IN THE AREA WHERE THIS STRUCTURE IS INSTALLED DO NOT ACCOMMODATE THIS GUYING ARRANGEMENT THEN THE CHANGES TO THE GUYING ARRANGEMENT SHALL BE NOTED ON THE RESPECTIVE PLAN AND PROFILE DRAWING.

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

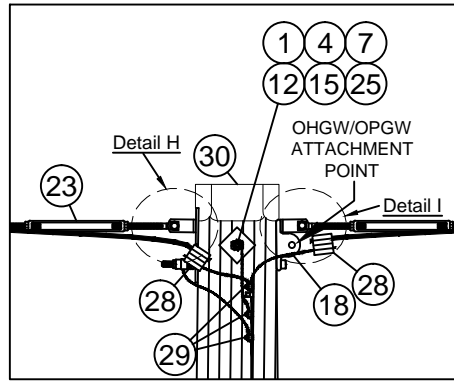
Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.			Drawing Scale: 1" = 12'	
	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - LAMINATED WOOD 345KV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR H-FRAME RUNNING ANGLE - 30° TO 45° STEEL CROSSARM TYPE ECR-2		REVISION 00 DATE 5/21/2015
	Drwn. By: B. Franklin Date Dr.: 2/15/2013	Checked By: Becken/Hart	Date Ck.: 3/18/2015	Approved By: Barry R. Hart Date App.: 5/20/2015
TM2.23.TN-3KA0B-X				Sheet 1

USE THE MACRO CUs INSTEAD OF INDIVIDUAL CU COMPONENTS FOR EASE OF WORK ORDER ENTRY.

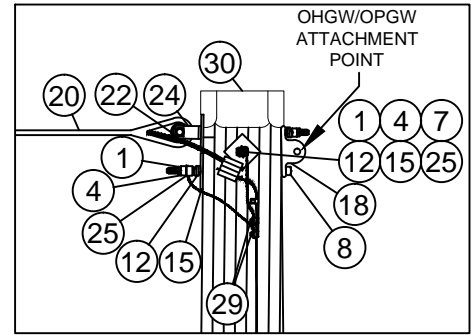
CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN3KA0B-K2H2	(6) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S3D1Y2-K	(2) TP-W-A1-G-H
C*M-TN3KA0B-K2HO	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD	TS-S3D1Y2-K	TP-W-A1-G-H
		(1) - 36 FIBER OPGW		TO-W-A2-G-O
C*M-TN3KA0B-K2HS	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD	TS-S3D1Y2-K	TP-W-A1-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-A2-G-S
C*M-TN3KA0B-L2H2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S3D1Y2-L	(2) TP-W-A1-G-H
C*M-TN3KA0B-L2HO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S3D1Y2-L	TP-W-A1-G-H
		(1) - 36 FIBER OPGW		TO-W-A2-G-O
C*M-TN3KA0B-L2HS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S3D1Y2-L	TP-W-A1-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-A2-G-S



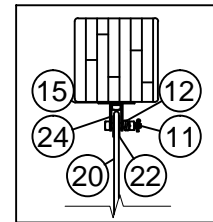
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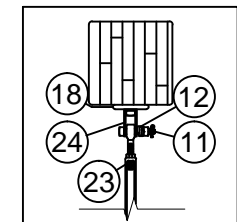
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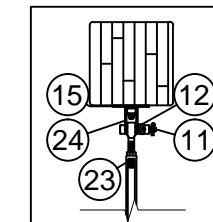
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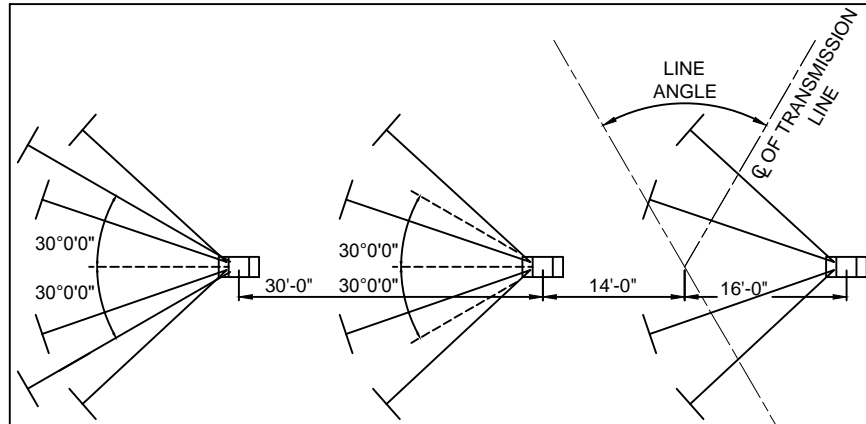
Detail 'G'



Detail 'H'



Detail 'I'



GUYING PLAN

CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.
 FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (C*_).
 REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.

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Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.

Drawing Scale: N/A



TRANSMISSION
CONSTRUCTION
STANDARDS
MANUAL

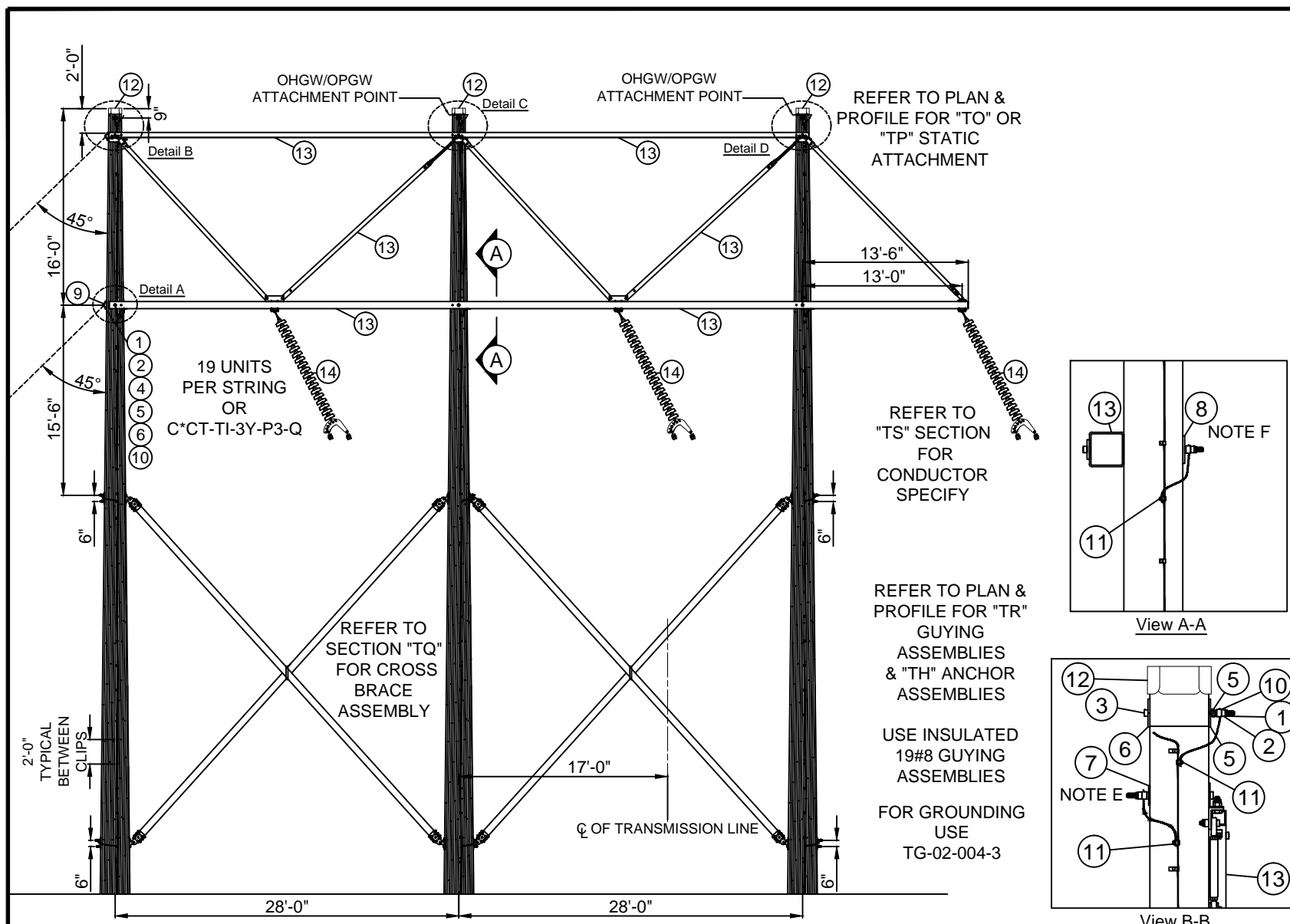
STRUCTURE STANDARDS - LAMINATED WOOD
345kV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR
H-FRAME RUNNING ANGLE - 30° TO 45° STEEL CROSSARM
TYPE ECR-2

REVISION
00
DATE
5/21/2015

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
B. Franklin	2/15/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015

TM2.23.TN-3KA0B-X

Sheet 2

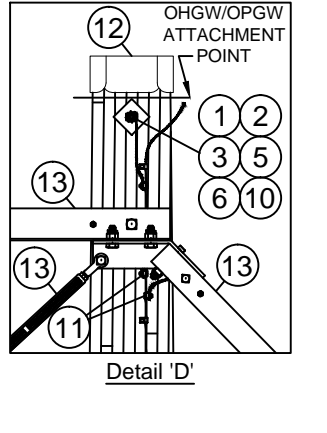
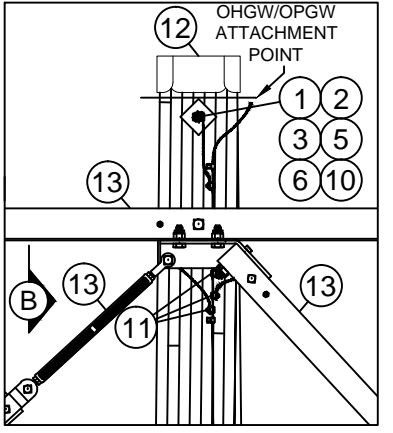
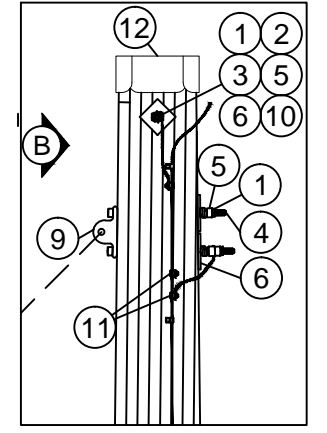
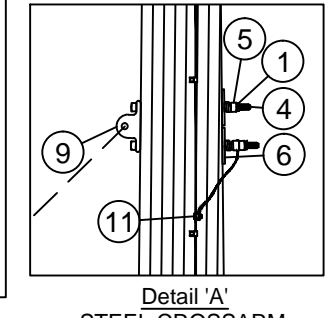
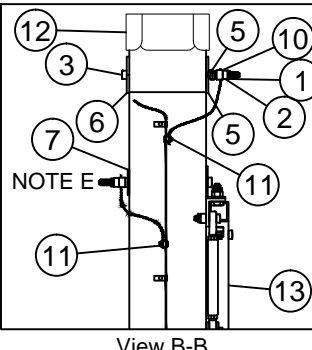
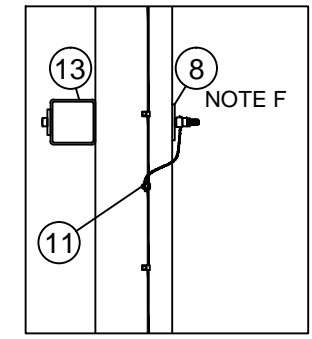


BILL OF MATERIAL (Type of CU: POLE)					
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-3KA6B	
1	11	EA	1000910800	NUT LCK MF SQ 7/8" BOLT GALV	
2	5	EA	6000273770	NUT SQ 7/8" BOLT GALV	
3	3	EA	1035475014	BOLT SQ HEAD 7/8 X 14 W/ SQ NUT (NOTE D)	
4	4	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE D)	
5	7	EA	6000274612	WASHER HELICAL (7/8")	
6	10	EA	1000946500	WASHER 4" SQ FLAT (7/8")	
7	3	EA	6000274844	WASHER 4" SQ FLAT (1")	
8	3	EA	6000274846	WASHER 4" SQ FLAT (1 1/4")	
9	2	EA	6000274505	DEAD END TEE, 60K	
10	5	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H	
11	14	EA	6000113712	WISE, PAR GROOVE GRND CNCTR BRZ, NO. 2 AWG CWLD	
12	3	EA	6000820052	POLE TOPPER 19"	

BILL OF MATERIAL (Type of CU: XARM)					
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TT-3S-A-FC70	
13	1 CU	EA	1036235455	SINGLE CROSSARM, STEEL, 7" X 7" X 70"	

BILL OF MATERIAL (Type of CU: INSO)					
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-19	
14	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (19 UNITS/STRING)	

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-3Y-P3-Q	
14	6	EA	6000313012	INS POLY Y-BALL 30K 19 UNIT EQ. W/COR RING	



CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (C*).

NOTE A: OTHER STANDARD DRAWINGS REQUIRED:
 TD FOUNDATION & BACKFILL
 TG GROUND WIRE & GROUND ROD DETAIL
 TK MARKINGS
 TH GUYING ASSEMBLIES
 TR GUY ANCHORS

NOTE B: POLE DRILLING: 7/8" BOLT - 15/16" DIAMETER HOLE
 1" BOLT - 1 1/16" DIAMETER HOLE
 1 1/4" BOLT - 1 5/16" DIAMETER HOLE

NOTE C: STRUCTURES USING 100' LONG POLES OR LONGER REQUIRE (2) CROSS BRACES, REFER TO SECTION TQ FOR ADDITIONAL CROSS BRACE ASSEMBLY.

NOTE D: LARGER OR SMALLER BOLTS MAY BE REQUIRED DEPENDING ON THE DIAMETER OF THE POLE USED. SUBSTITUTE MATERIAL ID (MID) ON THE WORK ORDER COMPONENTS PAGE FOR THE LENGTH NEEDED IF DIFFERENT THAN THE GENERIC LENGTH SHOWN IN THE BILL OF MATERIALS. CONTACT ENGINEERING STANDARDS - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

NOTE E: USE FLAT WASHER (ITEM #6) IN PLACE OF CURVED WASHER PROVIDED WITH STEEL CROSSARM CU.

NOTE F: USE FLAT WASHER (ITEM #8) IN PLACE OF CURVED WASHER PROVIDED WITH STEEL CROSSARM CU.

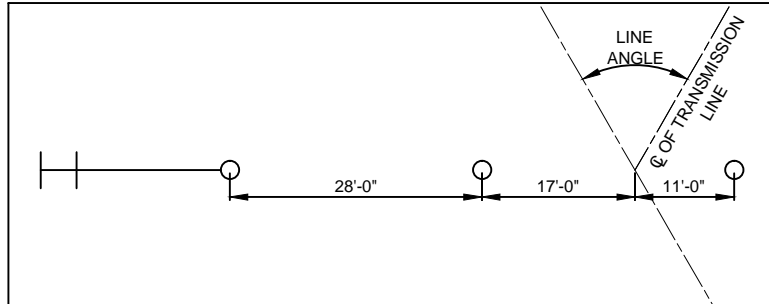
NOTE G: GUYING ANGLES SHOWN ARE GUIDELINES. IF THE SPECIFIC FIELD CONDITIONS IN THE AREA WHERE THIS STRUCTURE IS INSTALLED DO NOT ACCOMMODATE THIS GUYING ARRANGEMENT THEN THE CHANGES TO THE GUYING ARRANGEMENT SHALL BE NOTED ON THE RESPECTIVE PLAN AND PROFILE DRAWING.

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.				Drawing Scale: 1" = 12'	
	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - LAMINATED WOOD 345KV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR H-FRAME RUNNING ANGLE - 0° TO 3° SINGLE STEEL CROSSARM TYPE EBR-1			REVISION 00
	Drwn. By: B. Franklin Date Dr.: 1/25/2013	Checked By: Becken/Hart	Date Ck.: 3/18/2015	Approved By: Barry R. Hart Date App.: 5/20/2015	DATE 5/21/2015
TM2.23.TN-3KA6B-X					Sheet 1

USE THE MACRO CUs INSTEAD OF INDIVIDUAL CU COMPONENTS FOR EASE OF WORK ORDER ENTRY.

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN3KA6B-K2H2	(6) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S2A2Z1-K	(2) TP-L-TS-G-H
C*M-TN3KA6B-K2HO	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD	TS-S2A2Z1-K	TP-L-TS-G-H
		(1) - 36 FIBER OPGW		TO-L-TS-G-O
C*M-TN3KA6B-K2HS	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD	TS-S2A2Z1-K	TP-L-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-L-TS-G-S
C*M-TN3KA6B-L2H2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2Z1-L	(2) TP-L-TS-G-H
C*M-TN3KA6B-L2HO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2Z1-L	TP-L-TS-G-H
		(1) - 36 FIBER OPGW		TO-L-TS-G-O
C*M-TN3KA6B-L2HS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2Z1-L	TP-L-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-L-TS-G-S



GUYING PLAN

CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (C*_).

REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.

Drawing Scale: 1" = N/A



TRANSMISSION
CONSTRUCTION
STANDARDS
MANUAL

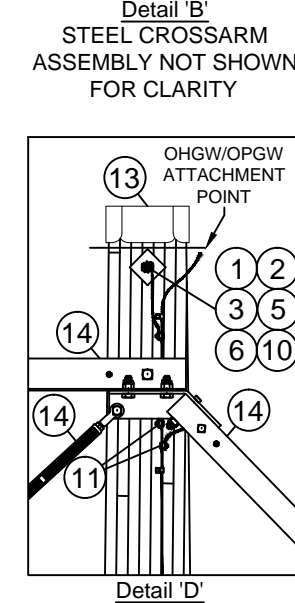
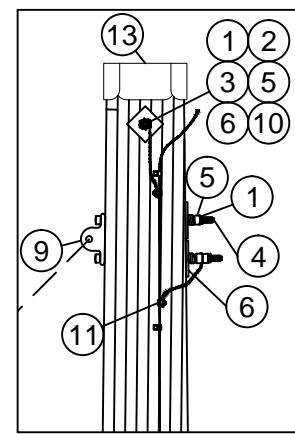
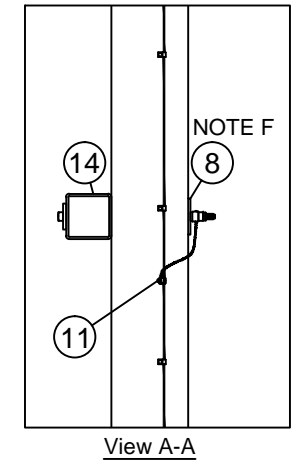
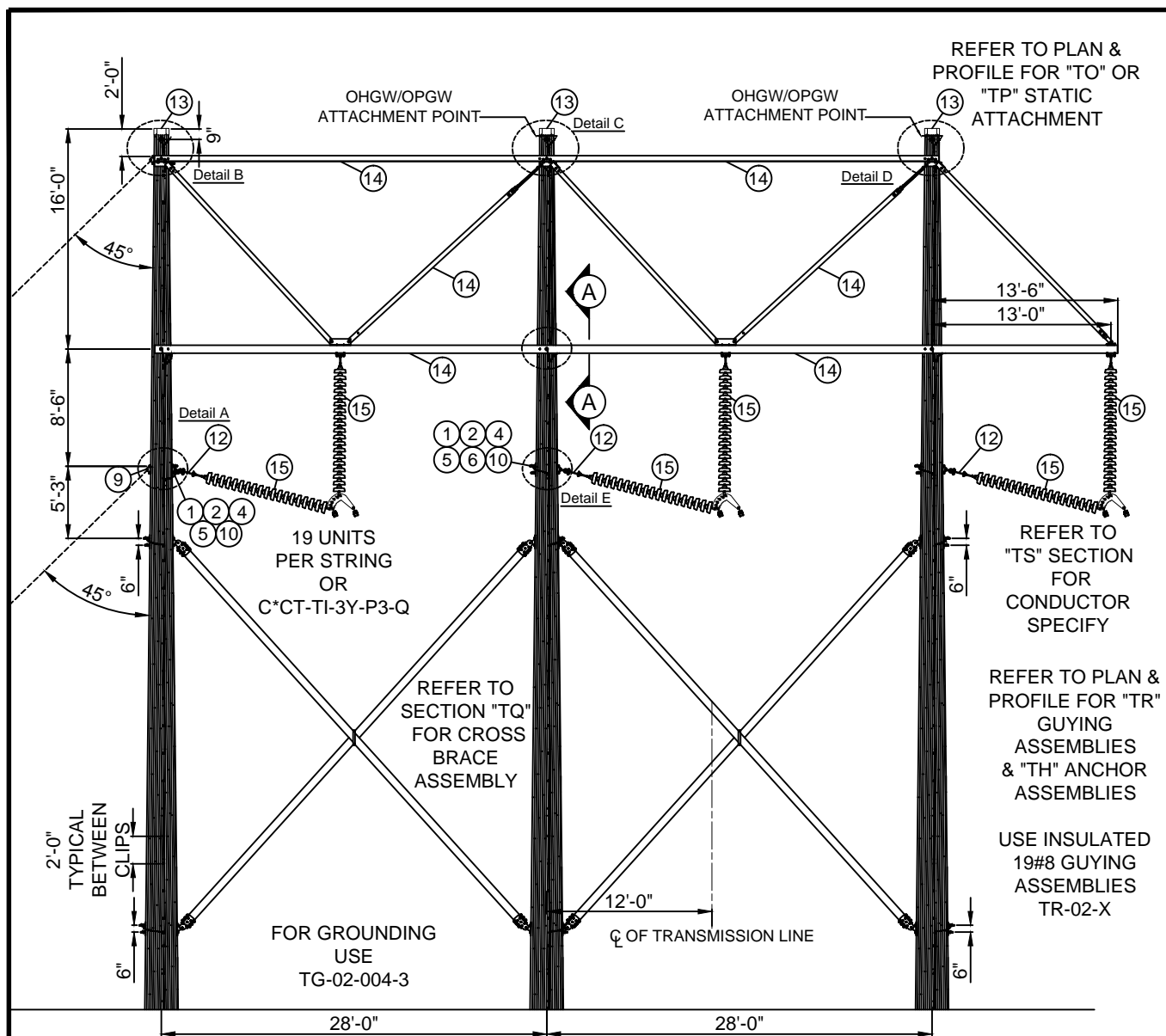
STRUCTURE STANDARDS - LAMINATED WOOD
345kV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR
H-FRAME RUNNING ANGLE - 0° TO 3° SINGLE STEEL CROSSARM
TYPE EBR-1

REVISION
00
DATE
5/21/2015

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
B. Franklin	1/25/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015

TM2.23.TN-3KA6B-X

Sheet 2



BILL OF MATERIAL (Type of CU: POLE)

CU: C*PT-TN-3KA7B

ITEM NO.	QTY.	UOM	IUSA MID	DESCRIPTION
1	15	EA	1000910800	NUT LCK MF SQ 7/8" BOLT GALV
2	7	EA	6000273770	NUT SQ 7/8" BOLT GALV
3	3	EA	1035475014	BOLT SQ HEAD 7/8 X 14 W/ SQ NUT (NOTE D)
4	8	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE D)
5	13	EA	6000274612	WASHER HELICAL (7/8")
6	10	EA	1000946500	WASHER 4" SQ FLAT (7/8")
7	3	EA	6000274844	WASHER 4" SQ FLAT (1")
8	3	EA	6000274846	WASHER 4" SQ FLAT (1 1/4")
9	5	EA	6000274505	DEAD END TEE, 60K
10	7	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
11	14	EA	6000113712	WISE, PAR GROOVE GRND CNCTR BRZ, NO. 2 AWG CWLD
12	3	EA	6000273421	EXTENSION STRAP, GALV., 2-1/2 X 12, 40K
13	3	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: XARM)

CU: C*PT-TT-3S-A-FC70

ITEM NO.	QTY.	UOM	IUSA MID	DESCRIPTION
14	1 CU	EA	1036235455	SINGLE CROSSARM, STEEL, 7" X 7" X 70"

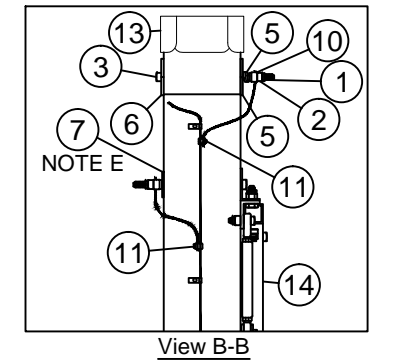
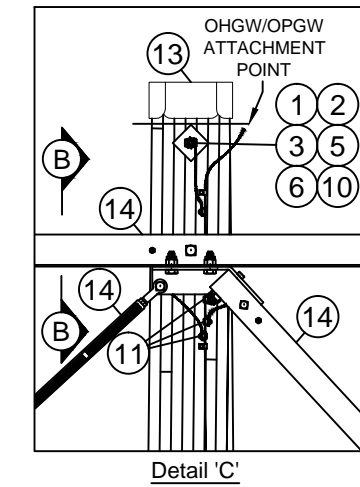
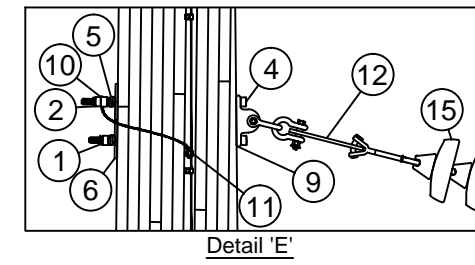
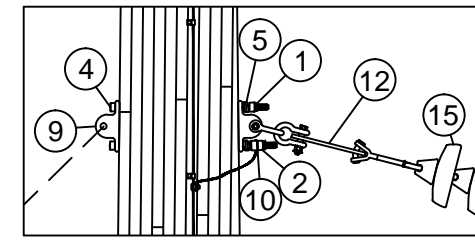
BILL OF MATERIAL (Type of CU: INSO)

CU: C*CT-TI-9P-D5-19

ITEM NO.	QTY.	UOM	IUSA MID	DESCRIPTION
15	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (19 UNITS/STRING)

CU: C*CT-TI-3Y-P3-Q

ITEM NO.	QTY.	UOM	IUSA MID	DESCRIPTION
15	6	EA	6000313012	INS POLY Y-BALL 30K 19 UNIT EQ. W/COR RING



CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (C*_).

NOTE A: OTHER STANDARD DRAWINGS REQUIRED:
 TD FOUNDATION & BACKFILL
 TG GROUND WIRE & GROUND ROD DETAIL
 TK MARKINGS
 TH GUYING ASSEMBLIES
 TR GUY ANCHORS

NOTE B: POLE DRILLING:
 7/8" BOLT - 15/16" DIAMETER HOLE
 1" BOLT - 1 1/16" DIAMETER HOLE
 1 1/4" BOLT - 1 5/16" DIAMETER HOLE

NOTE C: STRUCTURES USING 100' LONG POLES OR LONGER REQUIRE (2) CROSS BRACES, REFER TO SECTION TQ FOR ADDITIONAL CROSS BRACE ASSEMBLY.

NOTE D: LARGER OR SMALLER BOLTS MAY BE REQUIRED DEPENDING ON THE DIAMETER OF THE POLE USED. SUBSTITUTE MATERIAL ID (MID) ON THE WORK ORDER COMPONENTS PAGE FOR THE LENGTH NEEDED IF DIFFERENT THAN THE GENERIC LENGTH SHOWN IN THE BILL OF MATERIALS. CONTACT ENGINEERING STANDARDS - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

NOTE E: USE FLAT WASHER (ITEM #7) IN PLACE OF CURVED WASHER PROVIDED WITH STEEL CROSSARM CU.

NOTE F: USE FLAT WASHER (ITEM #8) IN PLACE OF CURVED WASHER PROVIDED WITH STEEL CROSSARM CU.

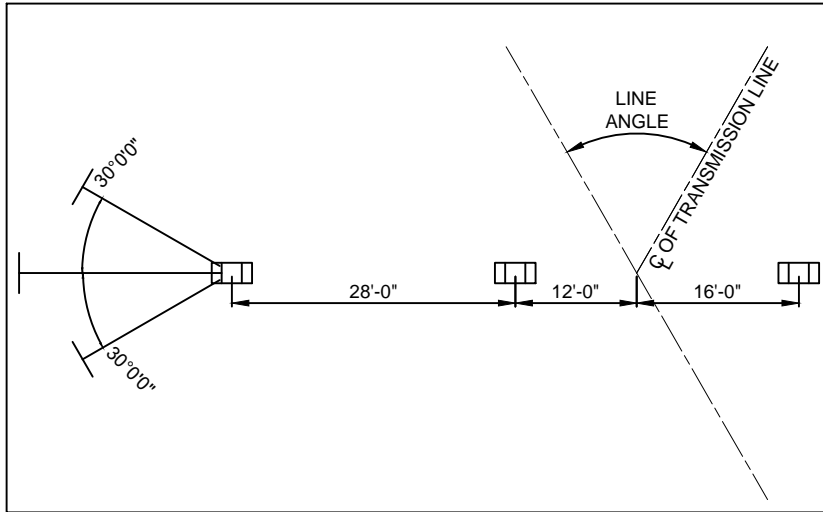
NOTE G: GUYING ANGLES SHOWN ARE GUIDELINES. IF THE SPECIFIC FIELD CONDITIONS IN THE AREA WHERE THIS STRUCTURE IS INSTALLED DO NOT ACCOMMODATE THIS GUYING ARRANGEMENT THEN THE CHANGES TO THE GUYING ARRANGEMENT SHALL BE NOTED ON THE RESPECTIVE PLAN AND PROFILE DRAWING.

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.				Drawing Scale: 1" = 12'	
	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - LAMINATED WOOD 345KV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR H-FRAME RUNNING ANGLE - 3° TO 10° SINGLE STEEL CROSSARM TYPE EBR-2			REVISION 00
					DATE 5/21/2015
Drwn. By: B. Franklin Date Dr.: 2/15/2013	Checked By: Becken/Hart	Date Ck.: 3/18/2015	Approved By: Barry R. Hart Date App.: 5/20/2015	TM2.23.TN-3KA7B-X Sheet 1	

USE THE MACRO CUs INSTEAD OF INDIVIDUAL CU COMPONENTS FOR EASE OF WORK ORDER ENTRY.

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN3KA7B-K2H2	(6) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S2A2W1-K	(2) TP-L-TS-G-H
C*M-TN3KA7B-K2HO	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD	TS-S2A2W1-K	TP-L-TS-G-H
		(1) - 36 FIBER OPGW		TO-L-TS-G-O
C*M-TN3KA7B-K2HS	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD	TS-S2A2W1-K	TP-L-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-L-TS-G-S
C*M-TN3KA7B-L2H2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2W1-L	(2) TP-L-TS-G-H
C*M-TN3KA7B-L2HO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2W1-L	TP-L-TS-G-H
		(1) - 36 FIBER OPGW		TO-L-TS-G-O
C*M-TN3KA7B-L2HS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2W1-L	TP-L-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-L-TS-G-S



GUYING PLAN

CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (C*_).

REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.

Drawing Scale: N/A



TRANSMISSION
CONSTRUCTION
STANDARDS
MANUAL

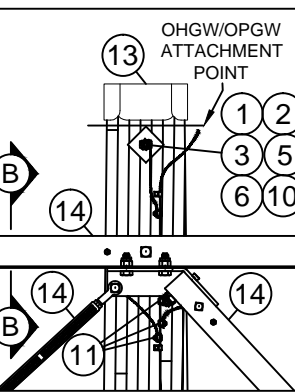
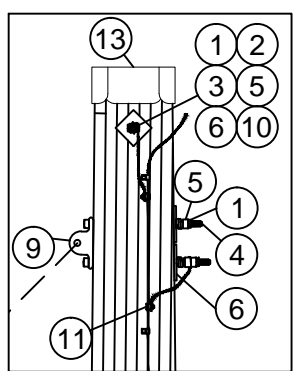
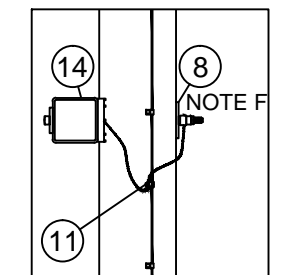
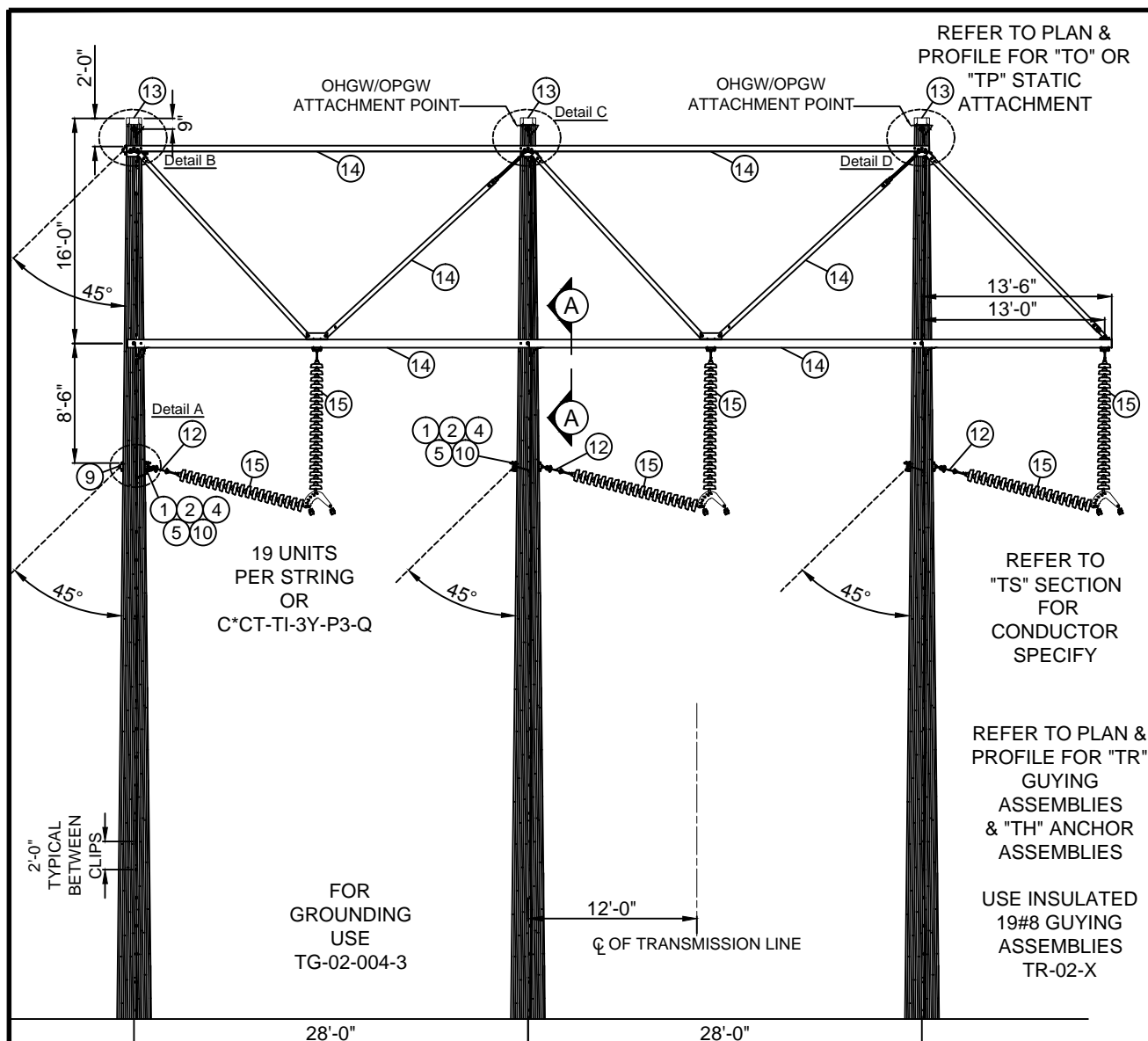
STRUCTURE STANDARDS - LAMINATED WOOD
345kV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR
H-FRAME RUNNING ANGLE - 3° TO 10° SINGLE STEEL CROSSARM
TYPE EBR-2

REVISION
00
DATE
5/21/2015

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
B. Franklin	2/15/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015

TM2.23.TN-3KA7B-X

Sheet 2



BILL OF MATERIAL (Type of CU: POLE)

CU: C*PT-TN-3KA8B

ITEM NO.	QTY.	UOM	IUSA MID	DESCRIPTION
1	15	EA	1000910800	NUT LCK MF SQ 7/8" BOLT GALV
2	7	EA	6000273770	NUT SQ 7/8" BOLT GALV
3	3	EA	1035475014	BOLT SQ HEAD 7/8 X 14 W/ SQ NUT (NOTE D)
4	8	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE D)
5	13	EA	6000274612	WASHER HELICAL (7/8")
6	6	EA	1000946500	WASHER 4" SQ FLAT (7/8")
7	3	EA	6000274844	WASHER 4" SQ FLAT (1")
8	3	EA	6000274846	WASHER 4" SQ FLAT (1 1/4")
9	7	EA	6000274505	DEAD END TEE, 60K
10	7	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
11	14	EA	6000113712	WISE, PAR GROOVE GRND CNCTR BRZ, NO. 2 AWG CWLD
12	3	EA	6000273421	EXTENSION STRAP, GALV., 2-1/2 X 12, 40K
13	3	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: XARM)

CU: C*PT-TT-3S-A-FC70

ITEM NO.	QTY.	UOM	IUSA MID	DESCRIPTION
14	1 CU	EA	1036235455	SINGLE CROSSARM, STEEL, 7" X 7" X 70"

BILL OF MATERIAL (Type of CU: INSO)

CU: C*CT-TI-9P-D5-19

ITEM NO.	QTY.	UOM	IUSA MID	DESCRIPTION
15	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (19 UNITS/STRING)

CU: C*CT-TI-3Y-P3-Q

ITEM NO.	QTY.	UOM	IUSA MID	DESCRIPTION
15	6	EA	6000313012	INS POLY Y-BALL 30K 19 UNIT EQ. W/COR RING

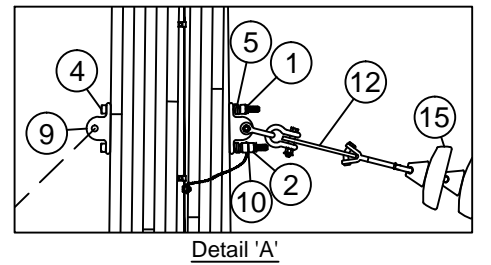
USE THE MACRO CUs INSTEAD OF INDIVIDUAL CU COMPONENTS FOR EASE OF WORK ORDER ENTRY.

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN3KA8B-K2H2	(6) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD (1) - 7#7 (7/16") AWLD	TS-S2A2W1-K	(2) TP-L-TS-G-H TP-L-TS-G-H
C*M-TN3KA8B-K2HO	(6) - 1192 ACSR 45/7	(1) - 36 FIBER OPGW	TS-S2A2W1-K	TO-L-TS-G-O
C*M-TN3KA8B-K2HS	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2W1-K	TP-L-TS-G-H TO-L-TS-G-S
C*M-TN3KA8B-L2H2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2W1-L	(2) TP-L-TS-G-H
C*M-TN3KA8B-L2HO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2W1-L	TP-L-TS-G-H TO-L-TS-G-O
C*M-TN3KA8B-L2HS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2W1-L	TP-L-TS-G-H TO-L-TS-G-S

CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (*).

- NOTE A: OTHER STANDARD DRAWINGS REQUIRED:
- TD FOUNDATION & BACKFILL
 - TG GROUND WIRE & GROUND ROD DETAIL
 - TK MARKINGS
 - TH GUYING ASSEMBLIES
 - TR GUY ANCHORS



NOTE B: POLE DRILLING: 7/8" BOLT - 15/16" DIAMETER HOLE
1" BOLT - 1 1/16" DIAMETER HOLE
1 1/4" BOLT - 1 5/16" DIAMETER HOLE

NOTE C: STRUCTURES USING 100' LONG POLES OR LONGER REQUIRE (2) CROSS BRACES, REFER TO SECTION TQ FOR ADDITIONAL CROSS BRACE ASSEMBLY.

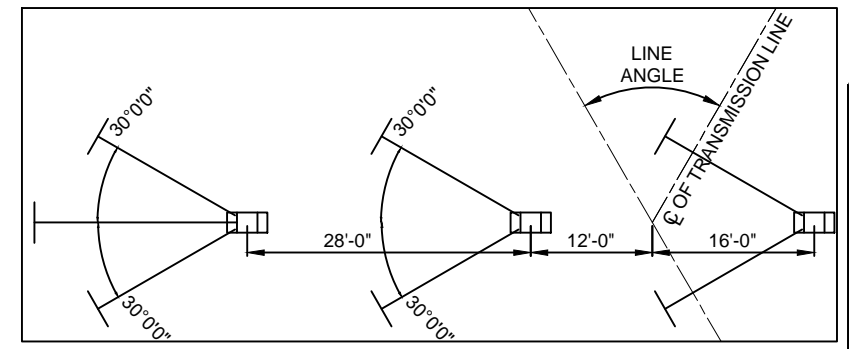
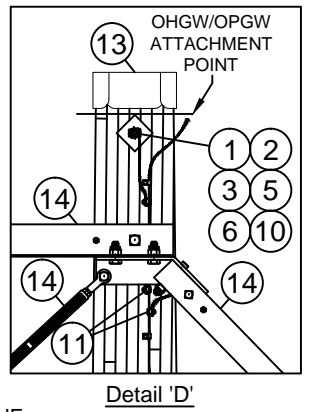
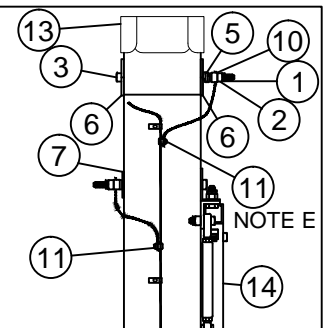
NOTE D: LARGER OR SMALLER BOLTS MAY BE REQUIRED DEPENDING ON THE DIAMETER OF THE POLE USED. SUBSTITUTE MATERIAL ID (MID) ON THE WORK ORDER COMPONENTS PAGE FOR THE LENGTH NEEDED IF DIFFERENT THAN THE GENERIC LENGTH SHOWN IN THE BILL OF MATERIALS. CONTACT ENGINEERING STANDARDS - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

NOTE E: USE FLAT WASHER (ITEM #7) IN PLACE OF CURVED WASHER PROVIDED WITH STEEL CROSSARM CU.

NOTE F: USE FLAT WASHER (ITEM #8) IN PLACE OF CURVED WASHER PROVIDED WITH STEEL CROSSARM CU.

NOTE G: GUYING ANGLES SHOWN ARE GUIDELINES. IF THE SPECIFIC FIELD CONDITIONS IN THE AREA WHERE THIS STRUCTURE IS INSTALLED DO NOT ACCOMMODATE THIS GUYING ARRANGEMENT THEN THE CHANGES TO THE GUYING ARRANGEMENT SHALL BE NOTED ON THE RESPECTIVE PLAN AND PROFILE DRAWING.

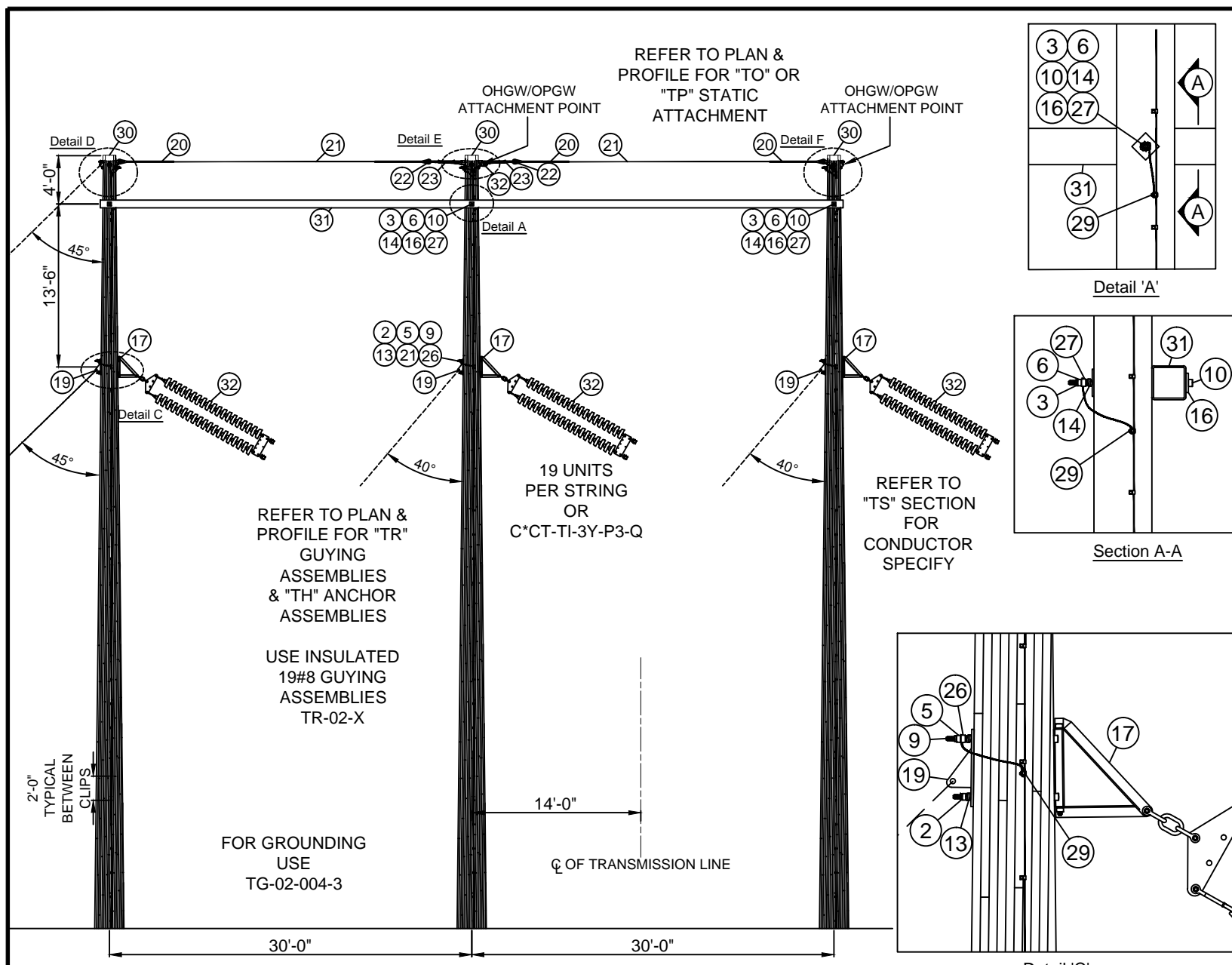
NOTE H: REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.



THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

Contact Engineering Standards - Transmission Section for the creation of new standards and CUs. Drawing Scale: 1" = 12'

	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - LAMINATED WOOD 345KV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR H-FRAME RUNNING ANGLE - 10° TO 20° SINGLE STEEL CROSSARM TYPE EBR-2	REVISION
			00
			DATE
			5/21/2015
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:
B. Franklin	2/15/2013	Becken/Hart	3/18/2015
Approved By:	Date App.:	TM2.23.TN-3KA8B-X	
Barry R. Hart	5/20/2015	Sheet 1	



REFER TO PLAN & PROFILE FOR "TR" GUYING ASSEMBLIES & "TH" ANCHOR ASSEMBLIES

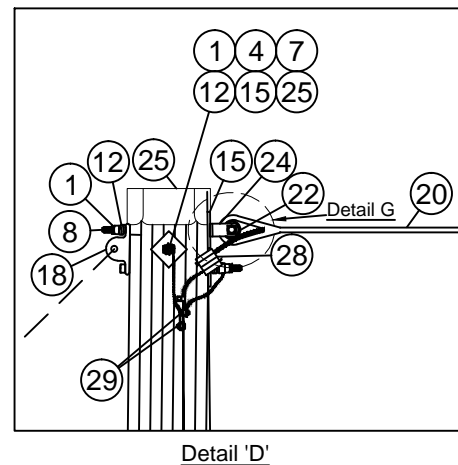
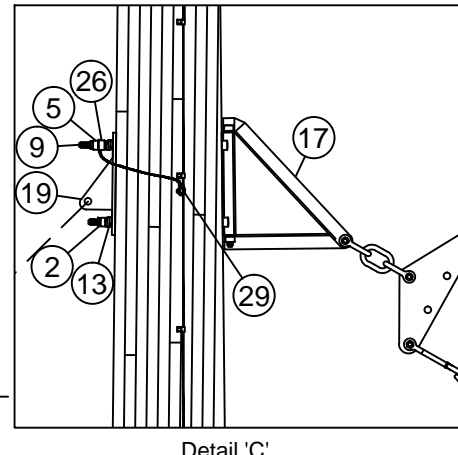
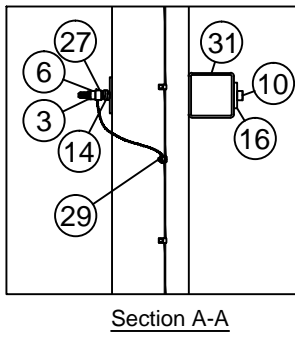
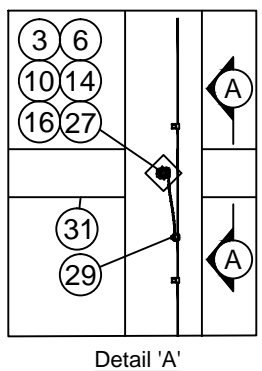
USE INSULATED 19#8 GUYING ASSEMBLIES TR-02-X

FOR GROUNDING USE TG-02-004-3

REFER TO PLAN & PROFILE FOR "TO" OR "TP" STATIC ATTACHMENT

REFER TO "TS" SECTION FOR CONDUCTOR SPECIFY

19 UNITS PER STRING OR C*CT-TI-3Y-P3-Q

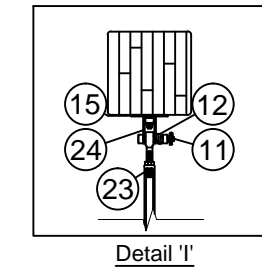
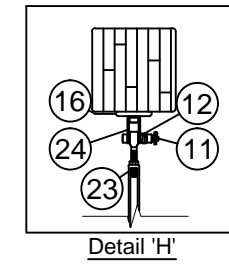
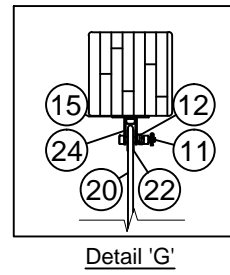


BILL OF MATERIAL (Type of CU: POLE)				
CU: C*PT-TN-3KA9B				
ITEM NO.	QTY.	UOM	IUISA MID	
1	9	EA	1000910800	NUT LCK MF SQ 7/8" BOLT GALV
2	9	EA	1000910900	NUT LCK MF SQ 1" BOLT GALV
3	3	EA	1000911000	NUT LCK MF SQ 1 1/4" BOLT GALV
4	6	EA	6000273770	NUT SQ 7/8" BOLT GALV
5	3	EA	1000912000	NUT SQ 1" BOLT GALV
6	3	EA	6000273782	NUT SQ 1-1/4" BOLT GALV
7	3	EA	1035475014	BOLT SQ HEAD 7/8 X 14 W/ SQ NUT (NOTE C)
8	6	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE C)
9	6	EA	1035476024	BOLT SQ HEAD 1 X 24 W/ SQ NUT (NOTE C)
10	3	EA	6000272050	BOLT SQ HEAD 1-1/4 X 28 W/ SQ NUT (NOTE C)
11	4	EA	6000272300	BOLT DRILLED, GALV., 7/8 X 4-3/4 W/SN & COTTER PIN
12	13	EA	6000274612	WASHER HELICAL (7/8")
13	6	EA	6000274614	WASHER HELICAL (1")
14	3	EA	6000274618	WASHER HELICAL (1 1/4")
15	12	EA	1000946500	WASHER 4" SQ FLAT (7/8")
16	6	EA	6000274846	WASHER 4" SQ FLAT (1 1/4")
17	3	EA	6000250718	BRACKET SWINGING ANGLE, 40K, INC. U-PLATE, BOLT & LOCKNUT
18	3	EA	6000274505	DEAD END TEE, 60K
19	3	EA	6000274507	HEAVY GUYING TEE, 70K
20	4	EA	1005259000	GRIP PRFRMD GUY 19#8 AWLD
21	80	FT	6000252362	WIRE ALWD GUY 19#8
22	4	EA	1010145562	THMBL ROLLER 3-1/4" DIA 1-1/16" H
23	2	EA	6000274527	TURNBUCKLE, 7/8 X 27 (+/- 6 IN), JAW-EYE, 30K
24	4	EA	6000272872	CLEVIS, DEADEND, 6-3/4 IN LENGTH, 25K
25	6	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
26	3	EA	1036200008	CLMP GRND WIRE U-CLIP 1-1/16" H
27	3	EA	6000251024	CLMP GRND WIRE U-CLIP 1-5/16" H
28	4	EA	6000113887	CONN COMP #2 SOL - 19#8 AWLD
29	14	EA	6000113712	WISE, PAR GROOVE GRND CNCTR BRZ, NO. 2 AWG CWLD
30	3	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: XARM)				
CU: C*PT-TT-3S-B-FC61				
ITEM NO.	QTY.	UOM	IUISA MID	
31	1 CU	EA	6000740821	SINGLE CROSSARM, STEEL, 7" X 7" X 61' 6"

BILL OF MATERIAL (Type of CU: INSO)				
CU: C*CT-TI-9P-D5-19				
ITEM NO.	QTY.	UOM	IUISA MID	
32	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (19 UNITS/STRING)

CU: C*CT-TI-3Y-P3-Q				
ITEM NO.	QTY.	UOM	IUISA MID	
32	6	EA	6000313012	INS POLY Y-BALL 30K 19 UNIT EQ. W/COR RING



CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (C*).

- NOTE A: OTHER STANDARD DRAWINGS REQUIRED:
- TD FOUNDATION & BACKFILL
 - TG GROUND WIRE & GROUND ROD DETAIL
 - TK MARKINGS
 - TH GUYING ASSEMBLIES
 - TR GUY ANCHORS

NOTE B: POLE DRILLING: 7/8" BOLT - 15/16" DIAMETER HOLE
1" BOLT - 1-1/16" DIAMETER HOLE
1-1/4" BOLT - 1-5/16" DIAMETER HOLE

NOTE C: LARGER OR SMALLER BOLTS MAY BE REQUIRED DEPENDING ON THE DIAMETER OF THE POLE USED. SUBSTITUTE MATERIAL ID (MID) ON THE WORK ORDER COMPONENTS PAGE FOR THE LENGTH NEEDED IF DIFFERENT THAN THE GENERIC LENGTH SHOWN IN THE BILL OF MATERIALS. CONTACT ENGINEERING STANDARDS - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

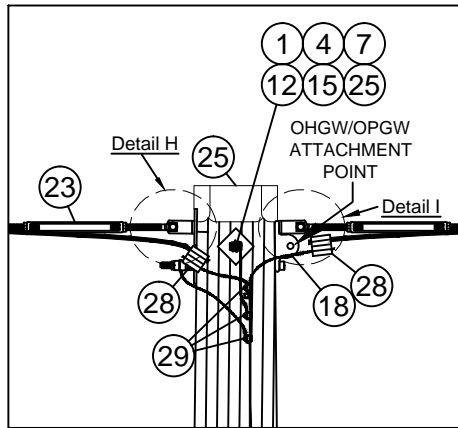
NOTE D: GUYING ANGLES SHOWN ARE GUIDELINES. IF THE SPECIFIC FIELD CONDITIONS IN THE AREA WHERE THIS STRUCTURE IS INSTALLED DO NOT ACCOMMODATE THIS GUYING ARRANGEMENT THEN THE CHANGES TO THE GUYING ARRANGEMENT SHALL BE NOTED ON THE RESPECTIVE PLAN AND PROFILE DRAWING.

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

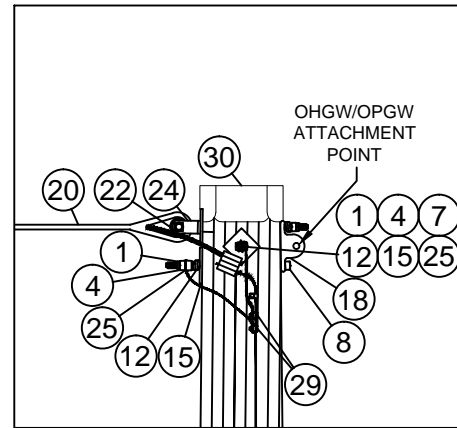
Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.				Drawing Scale: 1" = 12'	
	TRANSMISSION CONSTRUCTION STANDARDS MANUAL		STRUCTURE STANDARDS - LAMINATED WOOD 345KV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR H-FRAME RUNNING ANGLE - 20° TO 30° STEEL CROSSARM TYPE ECR-1		REVISION
	Drwn. By: B. Franklin Date Dr.: 2/15/2013		Checked By: Becken/Hart Date Ck.: 3/18/2015		00 DATE 5/21/2015
		Approved By: Barry R. Hart Date App.: 5/20/2015		TM2.23.TN-3KA9B-X Sheet 1	

USE THE MACRO CUs INSTEAD OF INDIVIDUAL CU COMPONENTS FOR EASE OF WORK ORDER ENTRY.

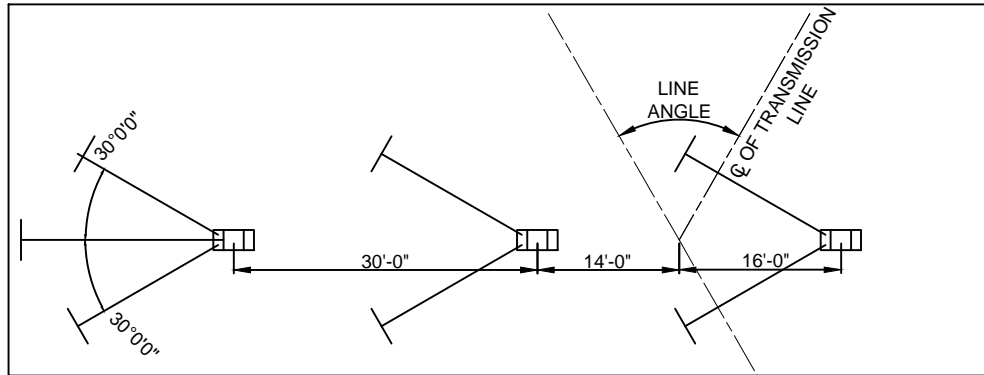
CU MACRO	CONDUCTOR	1ST STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN3KA9B-K2H2	(6) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S2A2D1-K	(2) TP-W-A1-G-H
C*M-TN3KA9B-K2HO	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD	TS-S2A2D1-K	TP-W-A1-G-H
		(1) - 36 FIBER OPGW		TO-W-A1-G-O
C*M-TN3KA9B-K2HS	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD	TS-S2A2D1-K	TP-W-A1-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-A1-G-S
C*M-TN3KA9B-L2H2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2D1-L	(2) TP-W-A1-G-H
C*M-TN3KA9B-L2HO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2D1-L	TP-W-A1-G-H
		(1) - 36 FIBER OPGW		TO-W-A1-G-O
C*M-TN3KA9B-L2HS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2D1-L	TP-W-A1-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-A1-G-S



Detail 'E'



Detail 'F'



GUYING PLAN

CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (C*_).

REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.

Drawing Scale: N/A



TRANSMISSION
CONSTRUCTION
STANDARDS
MANUAL

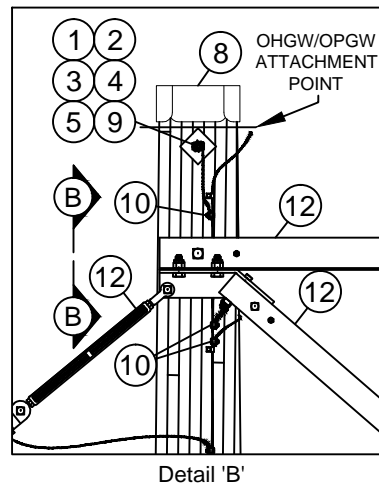
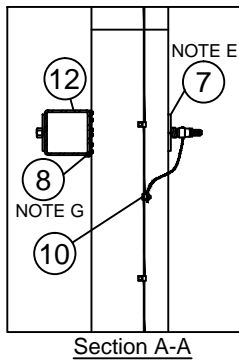
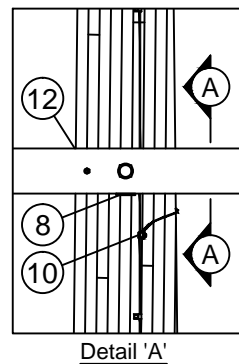
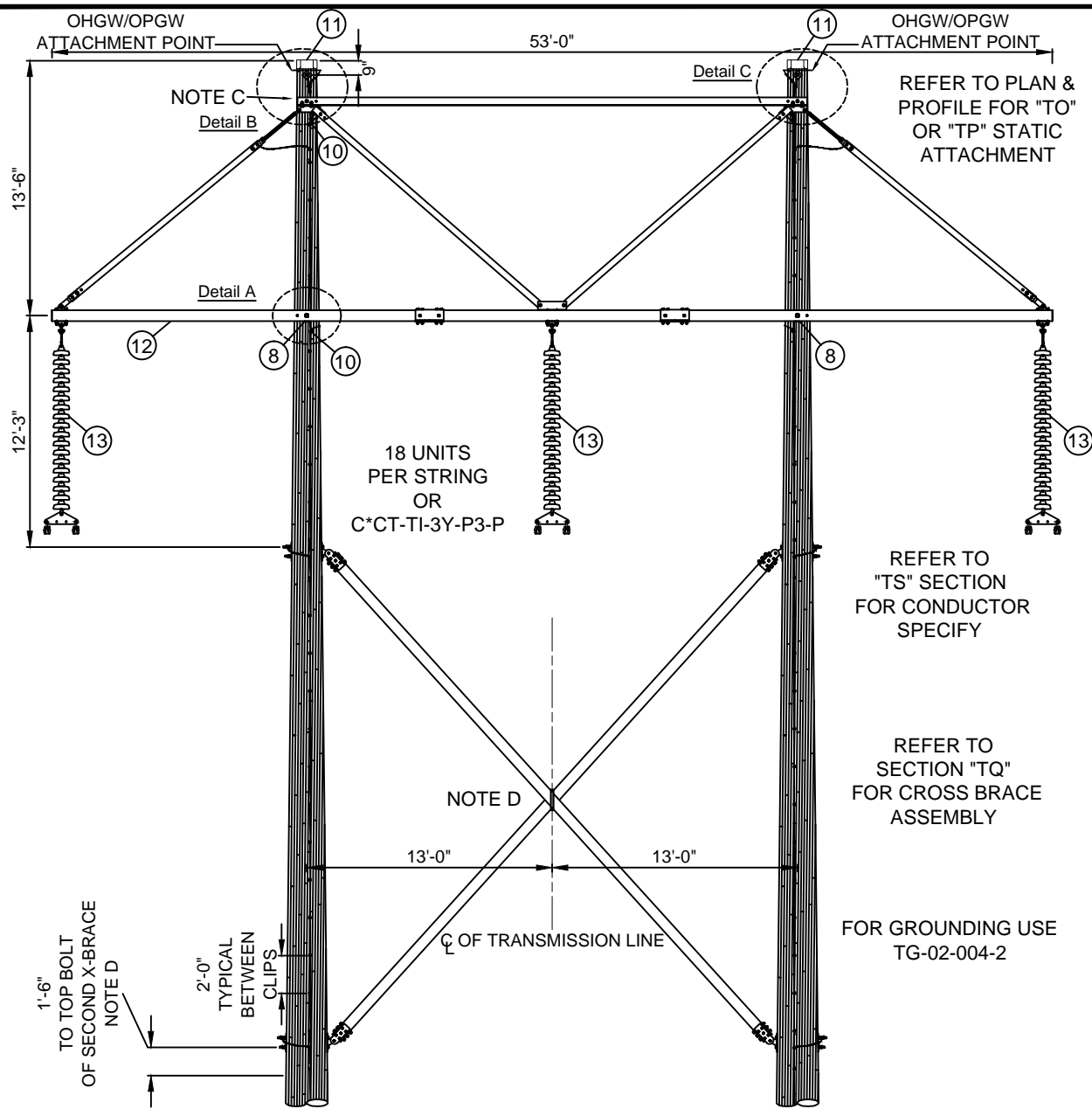
STRUCTURE STANDARDS - LAMINATED WOOD
345kV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR
H-FRAME RUNNING ANGLE - 20° TO 30° STEEL CROSSARM
TYPE ECR-1

REVISION
00
DATE
5/21/2015

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
B. Franklin	2/15/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015

TM2.23.TN-3KA9B-X

Sheet 2



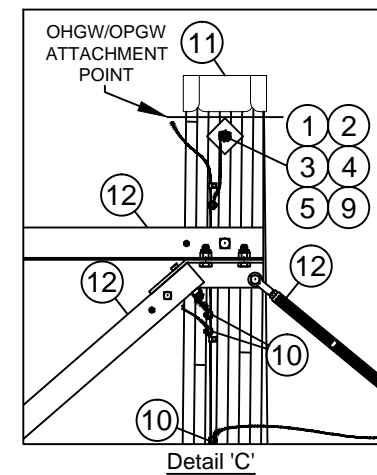
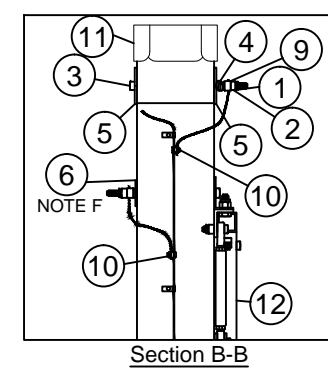
BILL OF MATERIAL (Type of CU: POLE)				
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-3KHTB
1	2	EA	1000910800	NUT LCK MF SQ 7/8" BOLT GALV
2	2	EA	6000273770	NUT SQ 7/8" BOLT GALV
3	2	EA	1035475014	BOLT SQ HEAD 7/8 X 14 W/ SQ NUT (NOTE H)
4	2	EA	6000274612	WASHER HELICAL (7/8")
5	4	EA	1000946500	WASHER 4" SQ FLAT (7/8")
6	2	EA	6000274844	WASHER 4" SQ FLAT (1")
7	2	EA	6000274846	WASHER 4" SQ FLAT (1 1/4")
8	2	EA	6000274005	PLATE TIE EMBOSSED 1-5/16 H
9	2	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
10	10	EA	6000113712	WISE, PAR GROOVE GRND CNCTR BRZ, NO. 2 AWG CWLD
11	2	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: XARM)				
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TT-3S-A-FC53
12	1 CU	EA	1036235452	SINGLE CROSSARM, STEEL, 7" X 7" X 53"

BILL OF MATERIAL (Type of CU: INSO)				
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-18
13	3 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (18 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-P
13	3 CUs	EA	6000313011	INS POLY Y-BALL 30K 18 UNIT EQ. W/COR RING

USE THE MACRO CUs INSTEAD OF INDIVIDUAL CU COMPONENTS FOR EASE OF WORK ORDER ENTRY.

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN3KHTB-K2H2	(6) - 1192 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2Y1-K	(2) TP-L-XX-H
C*M-TN3KHTB-K2HO	(6) - 1192 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2Y1-K	TP-L-XX-H TO-L-XX-O
C*M-TN3KHTB-K2HS	(6) - 1192 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2Y1-K	TP-L-XX-H TO-L-XX-S
C*M-TN3KHTB-L2H2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2Y1-L	(2) TP-L-XX-H
C*M-TN3KHTB-L2HO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2Y1-L	TP-L-XX-H TO-L-XX-O
C*M-TN3KHTB-L2HS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2Y1-L	TP-L-XX-H TO-L-XX-S



CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (C*_).

NOTE A: OTHER STANDARD DRAWINGS REQUIRED:
 TD FOUNDATION & BACKFILL
 TG GROUND WIRE & GROUND ROD DETAIL
 TK MARKINGS

NOTE B: POLE DRILLING: 7/8" BOLT - 15/16" DIAMETER HOLE
 X-ARM BOLT - 1 5/16" DIAMETER HOLE

NOTE C: TO LOCATE THIS HOLE ASSEMBLE CROSSARM, BRACES AND ASSOCIATED HARDWARE POSITION BRACES AGAINST POLE AND MARK POLE FOR DRILLING AT HOLES IN DEAD END TEE AND HOLE IN END PLATE.

NOTE D: STRUCTURES USING 100' LONG POLES OR LONGER REQUIRE (2) CROSS BRACES, REFER TO SECTION TQ FOR ADDITIONAL CROSS BRACE ASSEMBLY.

NOTE E: USE FLAT WASHER (ITEM 7) IN PLACE OF CURVED WASHER PROVIDED WITH STEEL CROSSARM CU.

NOTE F: USE FLAT WASHER (ITEM 6) IN PLACE OF CURVED WASHER PROVIDED WITH STEEL CROSSARM CU.

NOTE G: USE TIE PLATE (ITEM 8) IN PLACE OF GRID GAIN PROVIDED WITH STEEL CROSSARM CU.

NOTE H: LARGER OR SMALLER BOLTS MAY BE REQUIRED DEPENDING ON THE DIAMETER OF THE POLE USED. SUBSTITUTE MATERIAL ID (MID) ON THE WORK ORDER COMPONENTS PAGE FOR THE LENGTH NEEDED IF DIFFERENT THAN THE GENERIC LENGTH SHOWN IN THE BILL OF MATERIALS. CONTACT ENGINEERING STANDARDS - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

NOTE I: MOUNTING BOLTS, NUTS, WASHERS, GAINS, BONDING HARDWARE, BRACES AND CROSS-TIE ARE PROVIDED IN THE CROSSARM CU. DO NOT USE PROVIDED GAINS FOR LAMINATED POLES. DO NOT USE PROVIDED CURVED WASHER, USE FLAT WASHER (ITEM #6) IN PLACE PER DETAIL A ON SHEET 3.

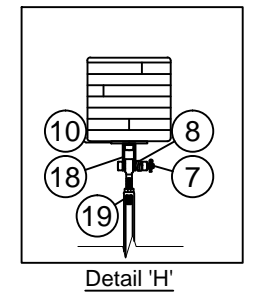
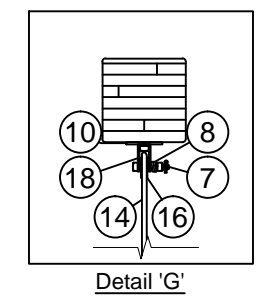
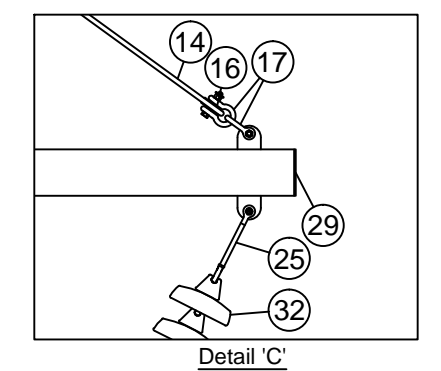
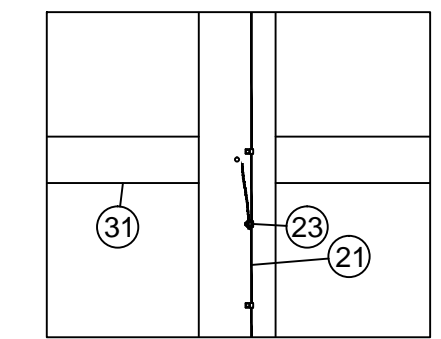
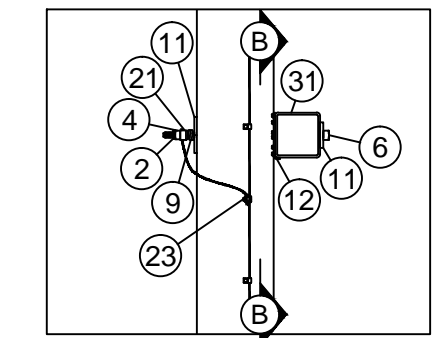
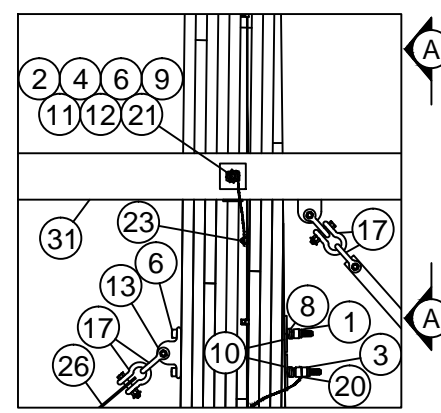
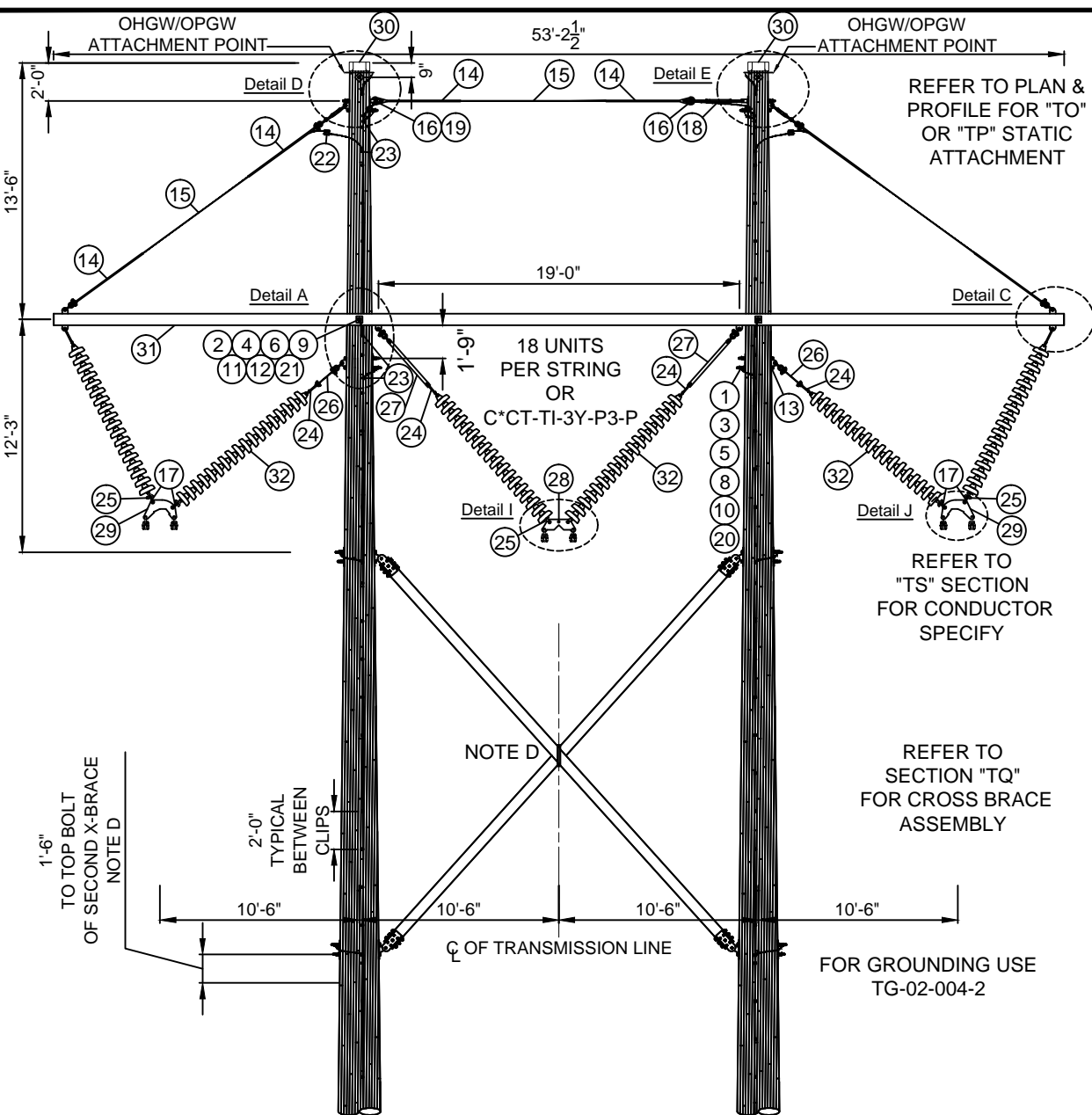
NOTE J: REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.

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Contact Engineering Standards - Transmission Section for the creation of new standards and CUs. Drawing Scale: 1" = 10'

	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - LAMINATED WOOD 345KV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR TANGENT H-FRAME - SINGLE STEEL CROSSARM TYPE EAR-1	REVISION 00 DATE 5/21/2015
	Drwn. By: B. Franklin Date Dr.: 8/21/2013	Checked By: Becken/Hart Date Ck.: 3/18/2015	Approved By: Barry R. Hart Date App.: 5/20/2015

TM2.23.TN-3KHTB-X Sheet 1



BILL OF MATERIAL (Type of CU: POLE)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-3KHWB
1	10	EA	1000910800	NUT LCK MF SQ 7/8" BOLT GALV
2	2	EA	1000911000	NUT LCK MF SQ 1 1/4" BOLT GALV
3	8	EA	6000273770	NUT SQ 7/8" BOLT GALV
4	2	EA	6000273782	NUT SQ 1 1/4" BOLT GALV
5	10	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE D)
6	2	EA	1035476024	BOLT SQ HEAD 1-1/4 X 28 W/ SQ NUT (NOTE D)
7	2	EA	6000272300	BOLT DRILLED, GALV., 7/8 X 4-3/4 W/SN & COTTER PIN
8	12	EA	6000274612	WASHER HELICAL (7/8")
9	2	EA	6000274618	WASHER HELICAL (1 1/4")
10	18	EA	1000946500	WASHER 4" SQ FLAT (7/8")
11	4	EA	6000274846	WASHER 4" SQ FLAT (1 1/4")
12	2	EA	6000274005	PLATE TIE EMBOSSED 1-5/16 H
13	4	EA	6000274505	DEAD END TEE, 60K
14	6	EA	1005259000	GRIP PRFRMD GUY 19#8 AWLD
15	80	FT	6000252362	WIRE ALWD GUY 19#8
16	6	EA	1010145562	THMBL ROLLER 3-1/4" DIA 1-1/16" H
17	20	EA	1039220531	SHCKL ANCH 7/8 BNK 1-1/4 OPNG
18	3	EA	6000274527	TURNBUCKLE, 7/8 X 27 (+/- 6 IN), JAW-EYE, 30K
19	2	EA	6000272872	CLEVIS, DEADEND, 6-3/4 IN LENGTH, 25K
20	8	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
21	2	EA	6000251024	CLMP GRND WIRE U-CLIP 1-5/16" H
22	4	EA	6000113887	CONN COMP #2 SOL - 19#8 AWLD
23	12	EA	6000113712	WISE, PAR GROOVE GRND CNCTR BRZ, NO. 2 AWG CWLD
24	6	EA	6000273160	FITTING CLV-Y BALL 30K 3/4" BNK
25	6	EA	1036416200	FITTING CLV-Y SCKT 30K SM NHL 3/4" BNK
26	2	EA	6000273425	EXTENSION STRAP, GALV., 2-1/2 X 14, 40K
27	2	EA	6000273426	EXTENSION STRAP, GALV., 2-1/2 X 36, 40K
28	1	EA	6000274145	PLATE YOKE, GALV., VEE, TANGENT, 40K
29	2	EA	6000274146	PLATE YOKE, GALV., VEE, CRESCENT TANGENT, 30K
30	2	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: XARM)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TT-3S-G-FC89
31	1 CU	EA	6000740823	SINGLE CROSSARM, STEEL, 7" X 7" X 53' 2-1/2"

BILL OF MATERIAL (Type of CU: INSO)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-18
32	3 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (18 UNITS/STRING)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-P
32	3 CUs	EA	6000313011	INS POLY Y BALL 30K 18 UNIT EQ. W/COR RING

CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (C*).

NOTE A: OTHER STANDARD DRAWINGS REQUIRED:
 TD FOUNDATION & BACKFILL
 TG GROUND WIRE & GROUND ROD DETAIL
 TK MARKINGS

NOTE B: POLE DRILLING: 7/8" BOLT - 15/16" DIAMETER HOLE
 1" BOLT - 1 1/16" DIAMETER HOLE
 1-1/4" BOLT - 1 5/16" DIAMETER HOLE

NOTE C: STRUCTURES USING 100' LONG POLES OR LONGER REQUIRE (2) CROSS BRACES, REFER TO SECTION TQ FOR ADDITIONAL CROSS BRACE ASSEMBLY.

NOTE D: LARGER OR SMALLER BOLTS MAY BE REQUIRED DEPENDING ON THE DIAMETER OF THE POLE USED. SUBSTITUTE MATERIAL ID (MID) ON THE WORK ORDER COMPONENTS PAGE FOR THE LENGTH NEEDED IF DIFFERENT THAN THE GENERIC LENGTH SHOWN IN THE BILL OF MATERIALS. CONTACT ENGINEERING STANDARDS - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

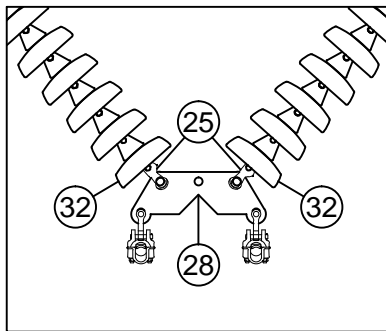
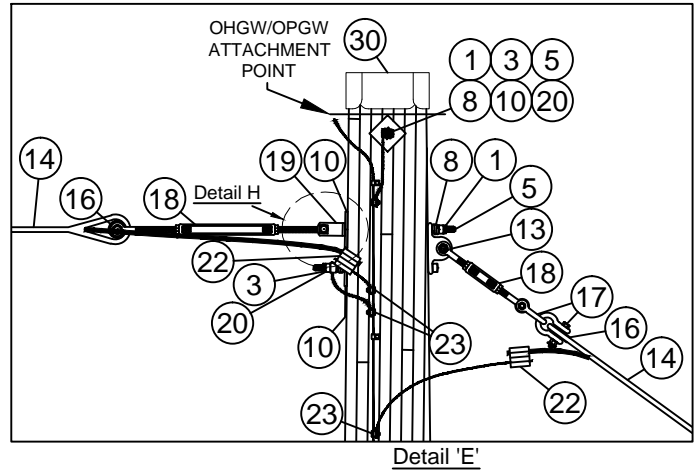
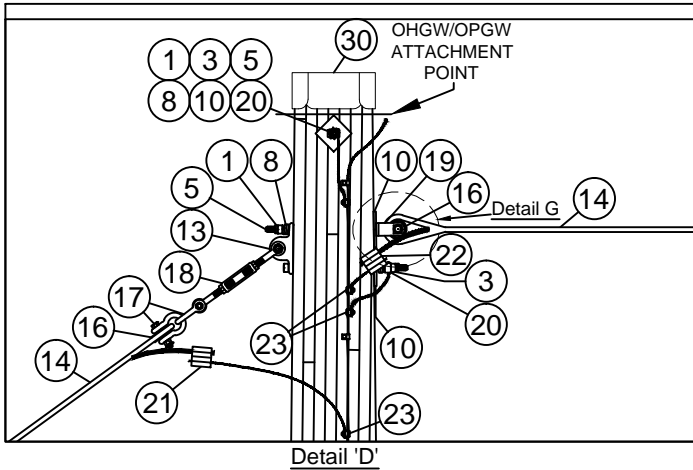
Contact Engineering Standards - Transmission Section for the creation of new standards and CUs. Drawing Scale: 1" = 10'

	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - LAMINATED WOOD 345KV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR TANGENT H-FRAME - VEE STRING INSULATORS SINGLE STEEL CROSSARM TYPE EAR-3	REVISION 00 DATE 5/21/2015
	Drwn. By: B. Franklin Date Dr.: 8/21/2013	Checked By: Becken/Hart	Date Ck.: 3/18/2015 Approved By: Barry R. Hart Date App.: 5/20/2015

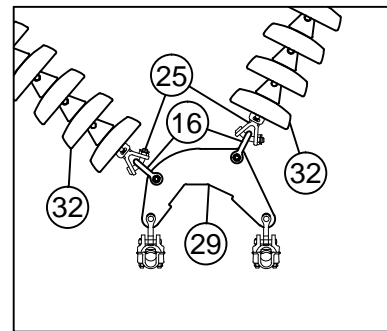
TM2.23.TN-3KHWB-X Sheet 1

USE THE MACRO CUs INSTEAD OF INDIVIDUAL CU COMPONENTS FOR EASE OF WORK ORDER ENTRY.

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN3KHWB-K2H2	(6) - 1192 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2-K	(2) TP-W-XX-H
C*M-TN3KHWB-K2HO	(6) - 1192 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2-K	TP-W-XX-H
		(1) - 36 FIBER OPGW		TO-W-XX-O
C*M-TN3KHWB-K2HS	(6) - 1192 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2-K	TP-W-XX-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-XX-S
C*M-TN3KHWB-L2H2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2-L	(2) TP-W-XX-H
C*M-TN3KHWB-L2HO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2-L	TP-W-XX-H
		(1) - 36 FIBER OPGW		TO-W-XX-O
C*M-TN3KHWB-L2HS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2-L	TP-W-XX-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-XX-S



Detail 'I'



Detail 'J'

CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (C*_).

REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.

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Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.

Drawing Scale: N/A



TRANSMISSION
CONSTRUCTION
STANDARDS
MANUAL

STRUCTURE STANDARDS - LAMINATED WOOD
345kV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR
TANGENT H-FRAME - VEE STRING INSULATORS SINGLE STEEL CROSSARM
TYPE EAR-3

REVISION
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DATE
5/21/2015

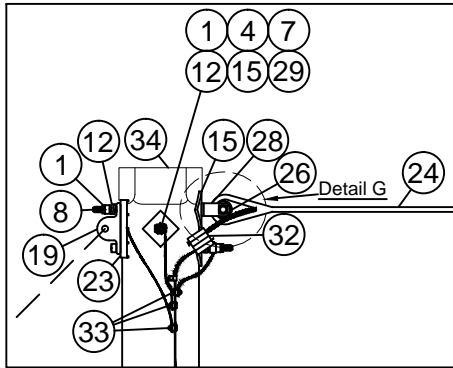
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
B. Franklin	8/21/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015

TM2.23.TN-3KHWB-X

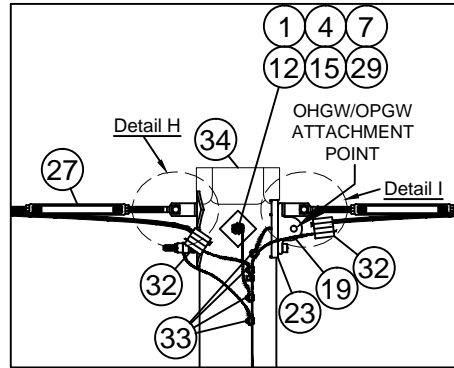
Sheet 2

USE THE MACRO CUs INSTEAD OF INDIVIDUAL CU COMPONENTS FOR EASE OF WORK ORDER ENTRY.

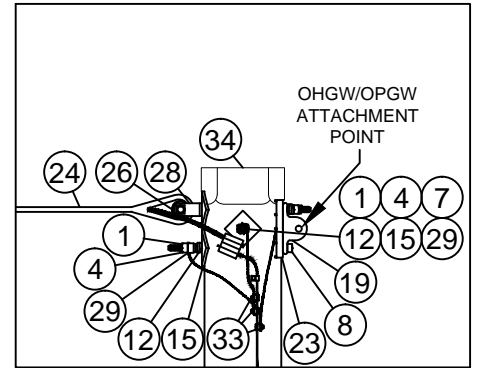
CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN3IA0B-K2H2	(6) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S3D1Y2-K	(2) TP-W-A1-G-H
C*M-TN3IA0B-K2HO	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S3D1Y2-K	TP-W-A1-G-H TO-W-A2-G-O
C*M-TN3IA0B-K2HS	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S3D1Y2-K	TP-W-A1-G-H TO-W-A2-G-S
C*M-TN3IA0B-L2H2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S3D1Y2-L	(2) TP-W-A1-G-H
C*M-TN3IA0B-L2HO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S3D1Y2-L	TP-W-A1-G-H TO-W-A2-G-O
C*M-TN3IA0B-L2HS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S3D1Y2-L	TP-W-A1-G-H TO-W-A2-G-S



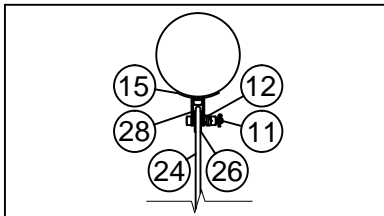
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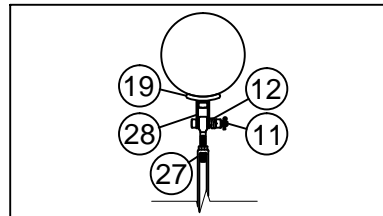
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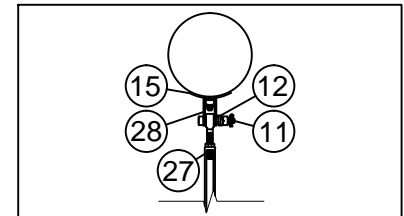
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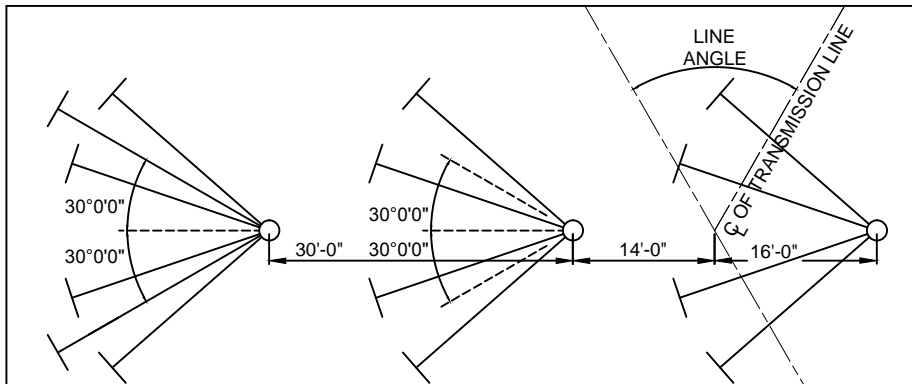
Detail 'G'



Detail 'H'



Detail 'I'



GUYING PLAN

CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 69KV THRU 344KV, T345 FOR 345KV & GREATER.

FOR CORRECT CU: SUBSTITUTE 5 FOR NYSEG, 6 FOR CMP OR 9 FOR RG&E IN PLACE OF ASTERISK (C*_).

REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.

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Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.

Drawing Scale: N/A



TRANSMISSION
CONSTRUCTION
STANDARDS
MANUAL

STRUCTURE STANDARDS - WOOD
345kV H-FRAME SINGLE CIRCUIT - BUNDLED CONDUCTOR
H-FRAME RUNNING ANGLE - 30° TO 45° STEEL CROSSARM
TYPE ECR-2

REVISION
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DATE
5/21/2015

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
B. Franklin	2/15/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015

TM2.23.TN-3IA0B-X

Sheet 2