

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
 TH GUYING ASSEMBLIES
 TK MARKINGS
 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: 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 D: REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.

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 SYSTEM ENGINEERING - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

NOTE F: MOUNTING BOLTS, NUTS AND WASHERS ARE PROVIDED WITH THE SPACER ASSEMBLY.

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

BILL OF MATERIAL (Type of CU: POLE)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-2HA0B
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 E)
8	6	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE E)
9	12	EA	1035476024	BOLT SQ HEAD 1 X 24 W/ SQ NUT (NOTE E)
10	3	EA	6000272050	BOLT SQ HEAD 1-1/4 X 28 W/ SQ NUT (NOTE E)
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	6000272355	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	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	23	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-2S-B-FC50
35	1	CU	EA 1036235426	SINGLE CROSSARM, STEEL, 7" X 7" X 50'

BILL OF MATERIAL - SINGLE CONDUCTOR PER PHASE (Type of CU: INSO)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-15
36	3	CU	EA 6000310768	INS SUS CL52-5 30K M&E GRY (15 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-M
36	3	EA	6000312037	INS POLY Y-BALL 30K 15 UNIT EQ. W/COR RING

ADDITIONAL BILL OF MATERIAL - TWO CONDUCTORS PER PHASE (Type of CU: INSO)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-15
36	3	CU	EA 6000310768	INS SUS CL52-5 30K M&E GRY (15 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-M
36	3	EA	6000312037	INS POLY Y-BALL 30K 15 UNIT EQ. W/COR RING

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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

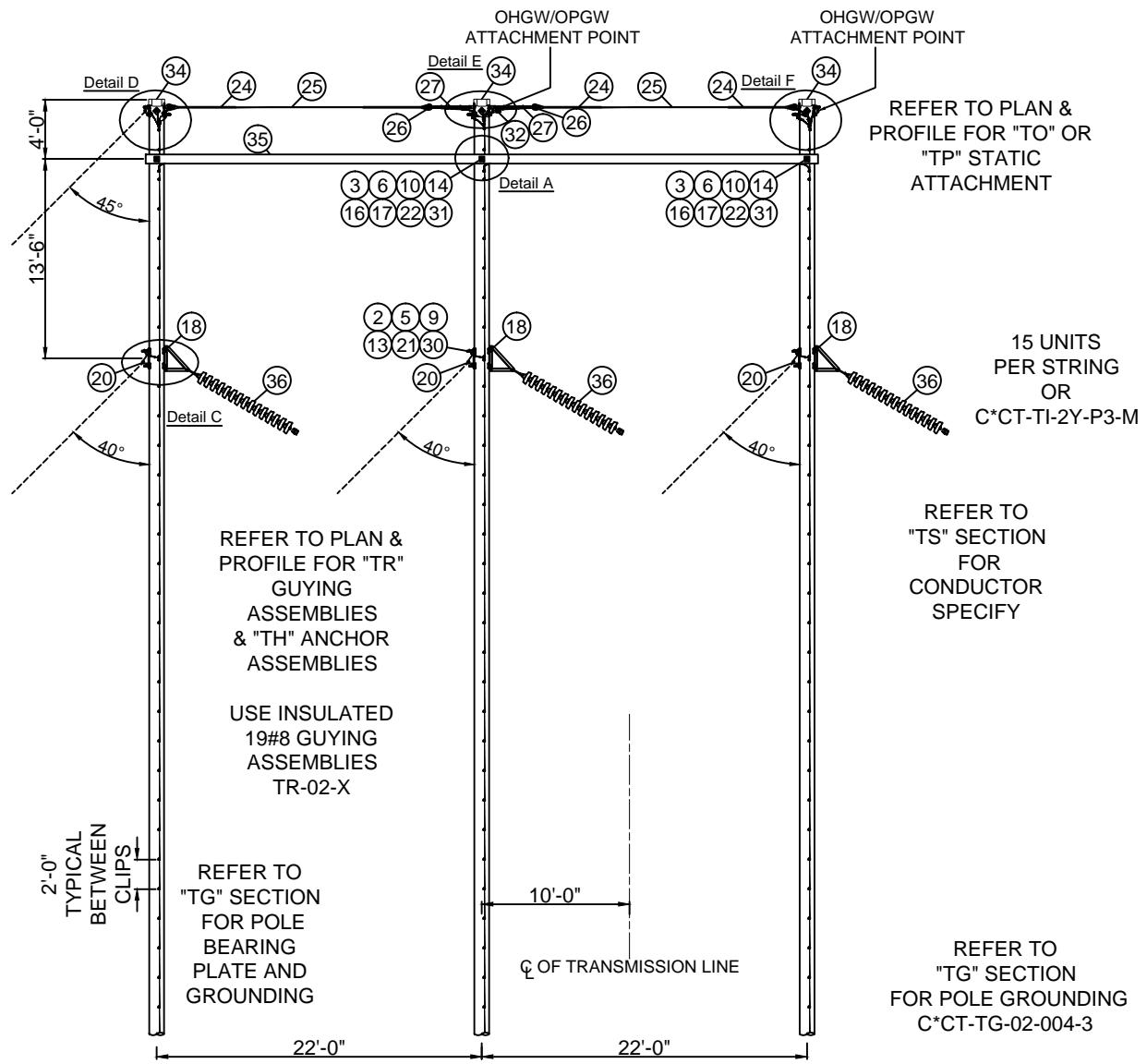
STRUCTURE STANDARDS - WOOD
 230KV H-FRAME SINGLE CIRCUIT
 H-FRAME RUNNING ANGLE - 30° TO 45° SINGLE STEEL CROSSARM

REVISION	00
DATE	5/21/2015

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
B. Franklin	2/14/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015

TM2.23.TN-2HA0B-X

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 (C*_).

- NOTE A: OTHER STANDARD DRAWINGS REQUIRED:
- TD FOUNDATION & BACKFILL
 - TG GROUND WIRE & GROUND ROD DETAIL
 - TH GUYING ASSEMBLIES
 - TK MARKINGS
 - 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: 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 D: REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.

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 SYSTEM ENGINEERING - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

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

BILL OF MATERIAL (Type of CU: POLE)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-2HA9B
1	9	EA	1000910800	NUT LCK MF SQ 7/8" BOLT GALV
2	6	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 E)
8	6	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE E)
9	6	EA	1035476024	BOLT SQ HEAD 1 X 24 W/ SQ NUT (NOTE E)
10	3	EA	6000272050	BOLT SQ HEAD 1-1/4 X 28 W/ SQ NUT (NOTE E)
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-2S-B-FC46
35	1 CU	EA	1036235420	SINGLE CROSSARM, STEEL, 7" X 7" X 46'

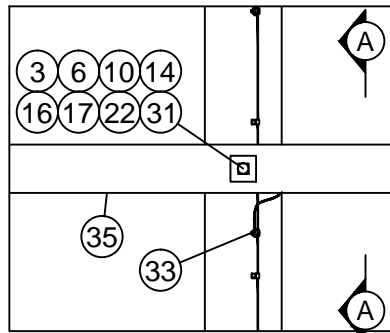
BILL OF MATERIAL - SINGLE CONDUCTOR PER PHASE (Type of CU: INSO)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-15
36	3 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (15 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-M
36	3	EA	6000312037	INS POLY Y-BALL 30K 15 UNIT EQ. W/COR RING
ADD'L BILL OF MATERIAL - TWO CONDUCTORS PER PHASE (Type of CU: INSO)				
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-15
36	3 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (15 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-M
36	3	EA	6000312037	INS POLY Y-BALL 30K 15 UNIT EQ. W/COR RING

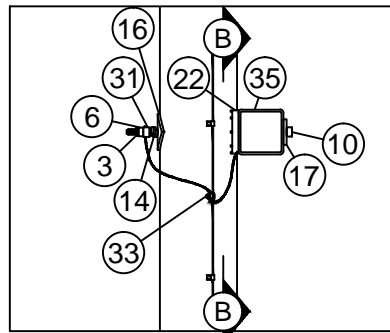
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Contact Engineering Standards - Transmission Section for the creation of new standards and CUs. Drawing Scale: N/A

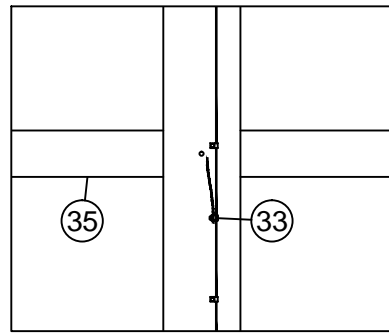
	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - WOOD 230KV H-FRAME SINGLE CIRCUIT H-FRAME RUNNING ANGLE - 20° TO 30° SINGLE STEEL CROSSARM	REVISION
			00
Drwn. By: B. Franklin	Date Dr.: 2/14/2013	Checked By: Becken/Hart	Date Ck.: 3/18/2015
Approved By: Barry R. Hart	Date App.: 5/20/2015	TM2.23.TN-2HA9B-X	
			Sheet 1



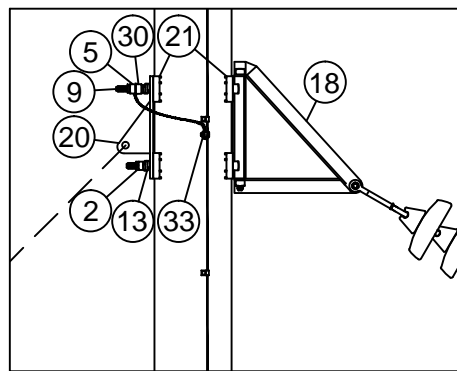
Detail 'A'



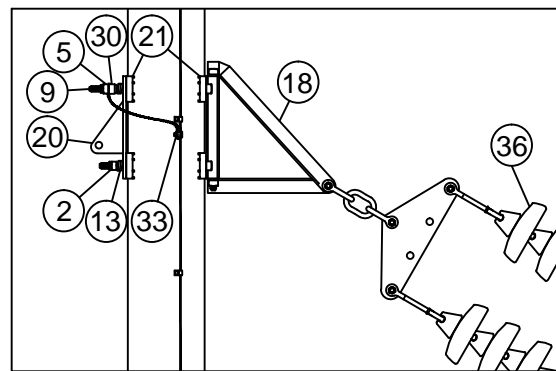
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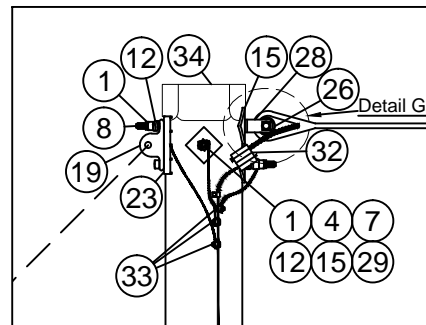
Section B-B



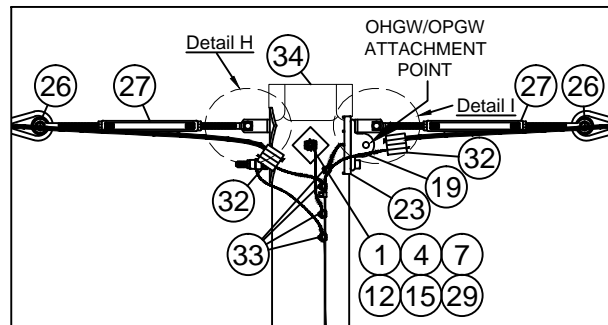
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SINGLE CONDUCTOR PER PHASE



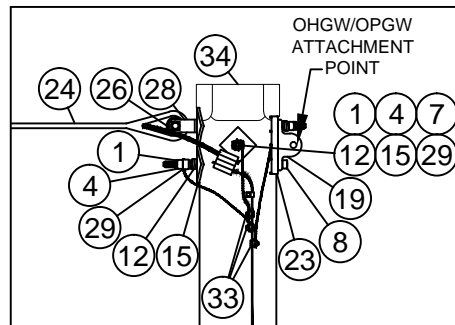
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TWO CONDUCTOR PER PHASE



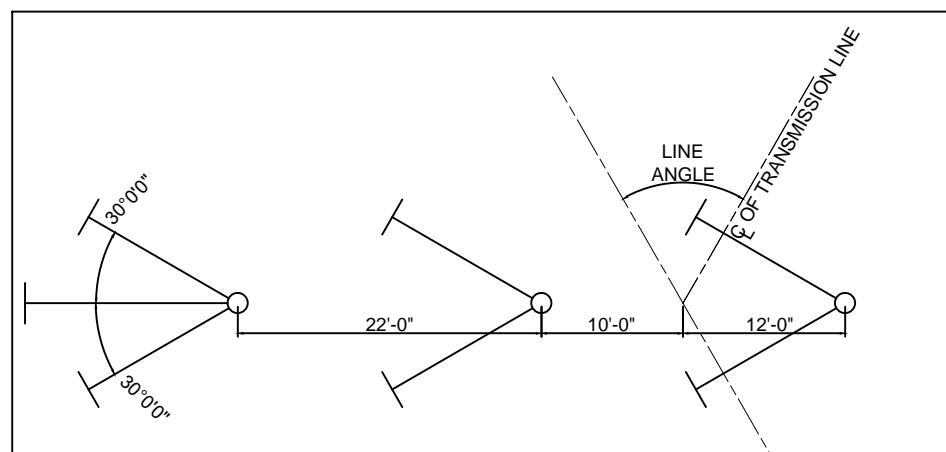
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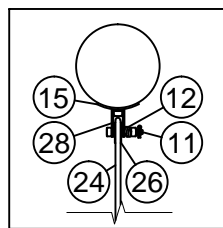
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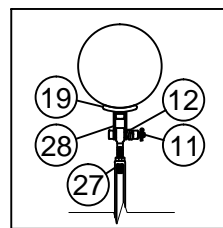
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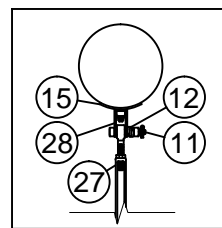
GUYING PLAN



Detail 'G'



Detail 'H'



Detail 'I'

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-TN2HA9B-X2H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-S1A1-X	(2) TP-W-TS-G-H
C*M-TN2HA9B-X2HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S1A1-X	TP-W-TS-G-H TO-W-TS-G-O
C*M-TN2HA9B-X2HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S1A1-X	TP-W-TS-G-H TO-W-TS-G-S
C*M-TN2HA9B-K2H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S1A1-K	(2) TP-W-TS-G-H
C*M-TN2HA9B-K2HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S1A1-K	TP-W-TS-G-H TO-W-TS-G-O
C*M-TN2HA9B-K2HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S1A1-K	TP-W-TS-G-H TO-W-TS-G-S
C*M-TN2HA9B-L2H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S1A1-L	(2) TP-W-TS-G-H
C*M-TN2HA9B-L2HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S1A1-L	TP-W-TS-G-H TO-W-TS-G-O
C*M-TN2HA9B-L2HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S1A1-L	TP-W-TS-G-H TO-W-TS-G-S
C*M-TN2IA9B-X2B2	(6) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-S2A2D1-X	(2) TP-W-TS-G-H
C*M-TN2IA9B-X2BO	(6) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2D1-X	TP-W-TS-G-H TO-W-TS-G-O
C*M-TN2IA9B-X2BS	(6) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2D1-X	TP-W-TS-G-H TO-W-TS-G-S
C*M-TN2IA9B-K2B2	(6) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S2A2D1-K	(2) TP-W-TS-G-H
C*M-TN2IA9B-K2BO	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2D1-K	TP-W-TS-G-H TO-W-TS-G-O
C*M-TN2IA9B-K2BS	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2D1-K	TP-W-TS-G-H TO-W-TS-G-S
C*M-TN2IA9B-L2B2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2D1-L	(2) TP-W-TS-G-H
C*M-TN2IA9B-L2BO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2D1-L	TP-W-TS-G-H TO-W-TS-G-O
C*M-TN2IA9B-L2BS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2D1-L	TP-W-TS-G-H TO-W-TS-G-S

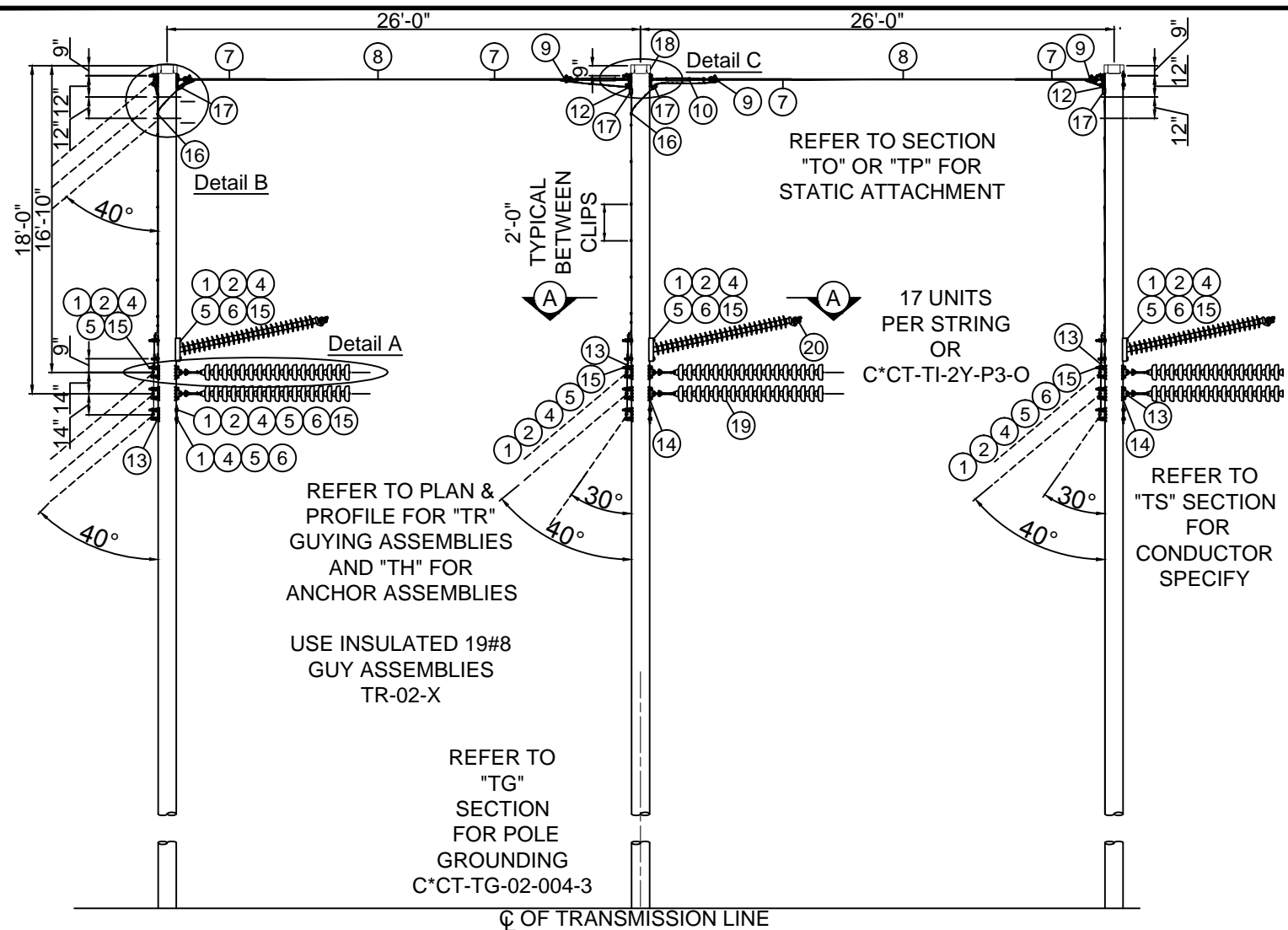
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Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.			Drawing Scale: N/A				
	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - WOOD 230KV H-FRAME SINGLE CIRCUIT H-FRAME RUNNING ANGLE - 20° TO 30° SINGLE STEEL CROSSARM		REVISION			
				00			
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:	TM2.23.TN-2HA9B-X	DATE
B. Franklin	2/14/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015		5/21/2015
						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*_).

REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.



BILL OF MATERIAL (Type of CU: POLE)				
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-2HDJL
1	30	EA	1000910800	NUT LCK MF SQ 7/8 BOLT GALV
2	15	EA	6000273770	NUT SQ 7/8" BOLT GALV
3	6	EA	1035475016	BOLT SQ HEAD 7/8 X 16 W/ SQ NUT (NOTE H)
4	24	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE H)
5	30	EA	6000274612	WASHER HELICAL (7/8")
6	18	EA	6000274880	WASHER 4" SQ CURVED (7/8")
7	4	EA	1005259000	GRIP PRFRMD GUY 19#8 AWLD
8	55	FT	6000252362	WIRE ALWD GUY 19#8
9	4	EA	1010145562	THMBL ROLLER 3-1/4" DIA 1-1/16" H
10	2	EA	6000274527	TURNBUCKLE, 7/8 X 27 (+/- 6 IN), JAW-ROD, 30K
11	8	EA	1039220531	SHCKL ANCH 7/8 BNK 1-1/4 OPNG
12	5	EA	6000274040	PLT POLE EYE 15/16 H
13	15	EA	6000274505	DEAD END TEE, 60K
14	15	EA	6000273231	GAIN GRID, 4-1/2" X 9", BONDING F/ 7/8 BOLTS
15	15	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
16	2	EA	1036232100	CONN 1B W/SPCR
17	4	EA	6000113887	CONN COMP #2 SOL - 19#8 AWLD
18	3	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: INSO) - SINGLE CONDUCTOR PER PHASE				
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-17
19	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (17 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-O
19	6	EA	6000312023	INS POLY Y-BALL 30K 17 UNIT EQ. W/COR RING
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-HC
20	3	EA	6000310281	INS LINE POST 230KV W/ CLAMP FITTING & GAIN BASE

ADDITIONAL BILL OF MATERIAL (Type of CU: INSO) - TWO CONDUCTORS PER PHASE				
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-17
19	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (17 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-O
19	6	EA	6000312023	INS POLY Y-BALL 30K 17 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
 - TH GUYING ASSEMBLIES
 - TK MARKINGS
 - TR GUY ANCHORS

NOTE B: POLE DRILLING: ALL HOLES - 15/16" DIAMETER

NOTE C: IF CONDUCTOR NESC HEAVY LOADING TENSION IS LESS THAN 10,000#, USE STRAIN CLAMPS; IF NESC TENSION IS 10,000# OR GREATER, USE COMPRESSION DEAD END ASSEMBLIES.

NOTE D: FOR LINE ANGLES LESS THAN 20° DEAD END ASSEMBLIES SHALL BE INSTALLED BACK TO BACK AND SUBSEQUENTLY THE CORRESPONDING IN-LINE GUYS SHALL BE INSTALLED BACK TO BACK.


NOTE E: FOR SHALLOW ANGLES, THE STATIC WIRE IN-LINE GUYS MAY BE SHIFTED OUT OF DIRECT LINE IN ORDER TO MAINTAIN PROPER CLEARANCE TO THE PHASE CONDUCTORS.

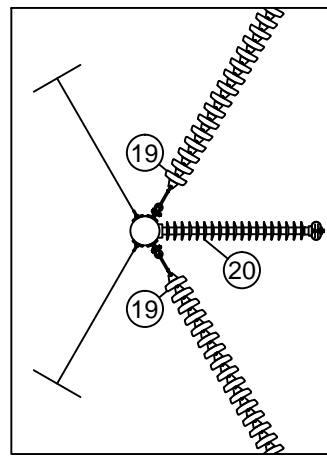
NOTE F: IF POLE SPACING IS DIFFERENT IT SHALL BE NOTED ON THE PLAN AND PROFILE DRAWINGS.

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.

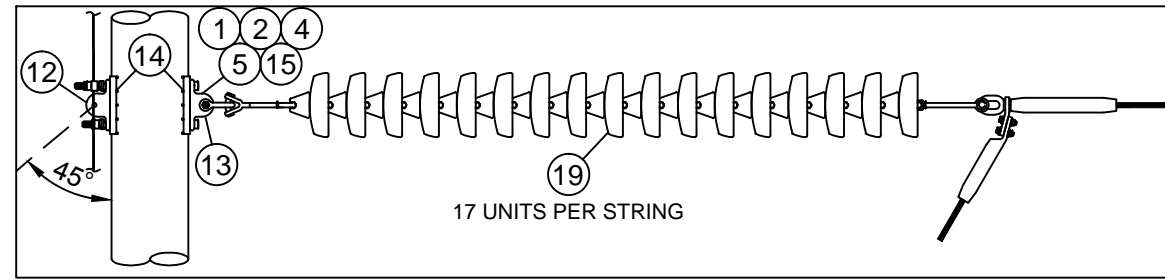
NOTE H: LARGER OR SMALLER BOLTS MAY BE REQUIRED DEPENDING ON THE DIAMETER OF THE POLE USED. SUBSTITUTE MATERIAL ID (MID) ON THE WORK ORDER COMPONENTS PAGE FOR THE LENGTH NEEDED IF DIFFERENT THAN THE GENERIC LENGTH SHOWN IN THE BILL OF MATERIALS. CONTACT SYSTEM ENGINEERING - TRANSMISSION SECTION IF YOU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

NOTE I: USE A STEEL DEADEND STRUCTURE WHEN USING BUNDLED CONDUCTOR CONFIGURATION.

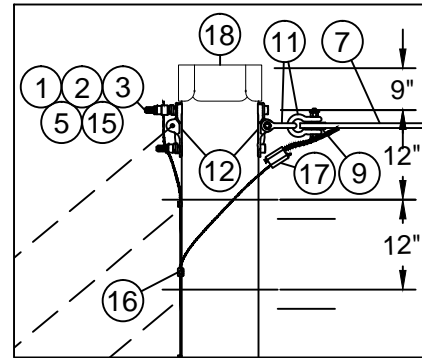
THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY				
Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.				Drawing Scale: N/A
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			REVISION	00
		DATE	5/21/2015	
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:
B. Franklin	2/15/2013	Becken/Hart	3/18/2015	Barry R. Hart
			Date App.:	5/20/2015
TM2.23.TN-2HDJL-X				Sheet 1



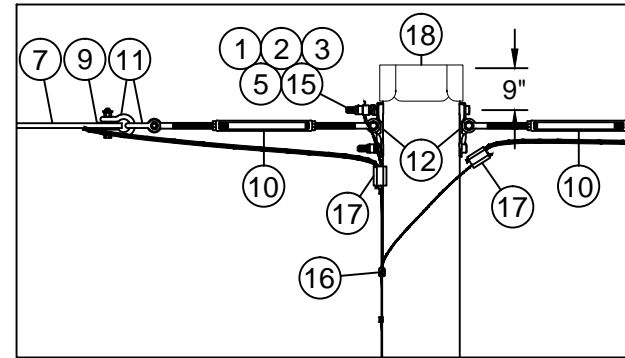
VIEW A-A



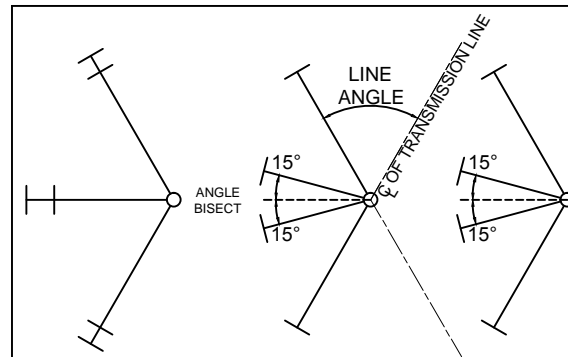
Detail 'A'
(ASSEMBLY FOR COMPRESSION CLAMP SINGLE CONDUCTOR PER PHASE SHOWN)



Detail 'B'



Detail 'C'



GUYING PLAN

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

BILL OF MATERIAL WITH STRAIN CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2HDJLF-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-X	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2HDJLF-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-X	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2HDJLF-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-X	TP-W-AU-G-H TO-W-AD-G-S
C*M-TN2HDJLF-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-K	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2HDJLF-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-K	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2HDJLF-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-K	TP-W-AU-G-H TO-W-AD-G-S
C*M-TN2HDJLF-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-L	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2HDJLF-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-L	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2HDJLF-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-L	TP-W-AU-G-H TO-W-AD-G-S

BILL OF MATERIAL WITH COMPRESSION DEADEND CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2HDJLG-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-C2P1-X	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2HDJLG-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-X	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2HDJLG-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-X	TP-W-AU-G-H TO-W-AD-G-S
C*M-TN2HDJLG-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-C2P1-K	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2HDJLG-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-K	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2HDJLG-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-K	TP-W-AU-G-H TO-W-AD-G-S
C*M-TN2HDJLG-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-C2P1-L	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2HDJLG-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-L	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2HDJLG-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-L	TP-W-AU-G-H TO-W-AD-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*_).

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

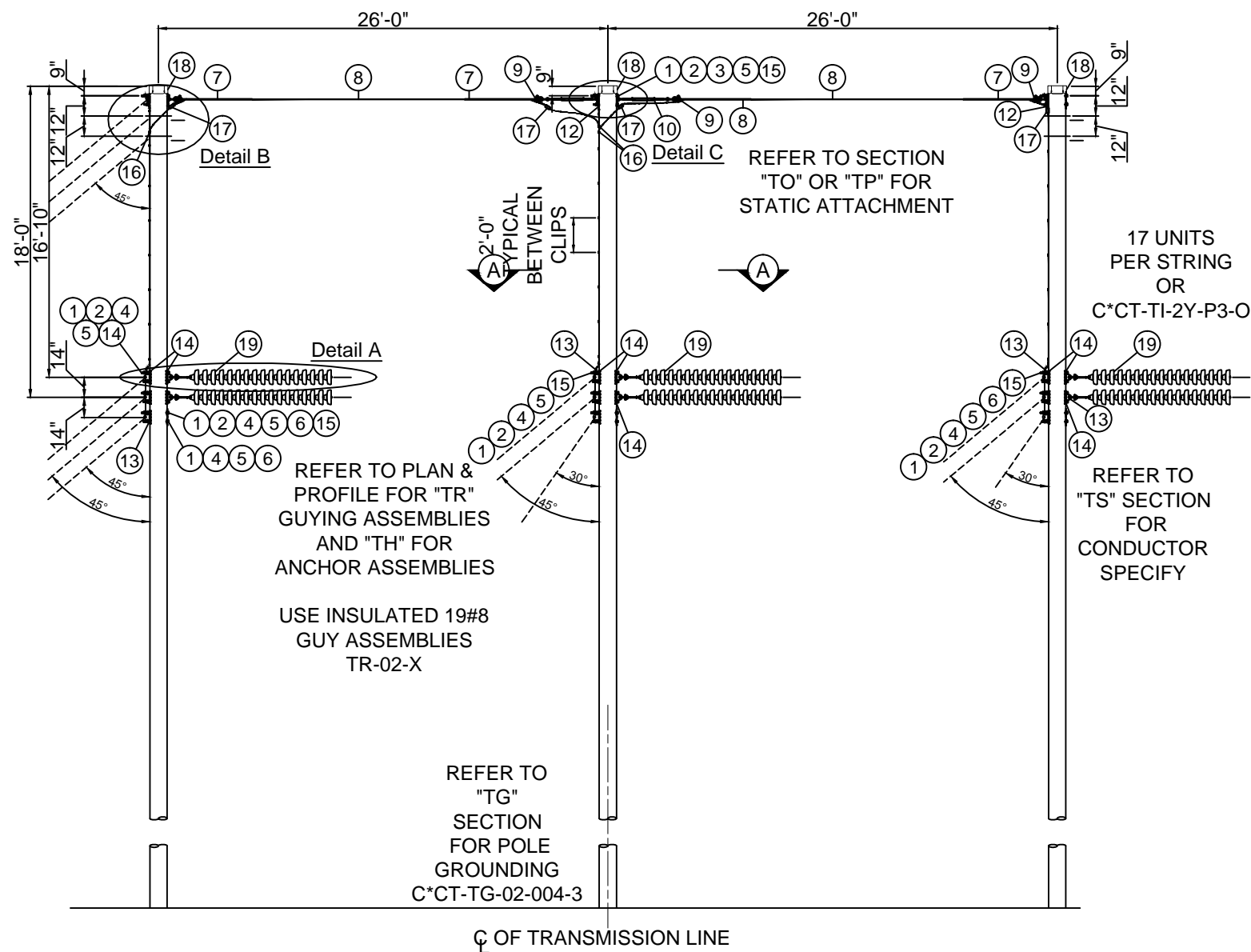


TRANSMISSION
CONSTRUCTION
STANDARDS
MANUAL

STRUCTURE STANDARDS - WOOD
230KV H-FRAME SINGLE CIRCUIT
ANGLE DEAD END 60° AND LESS

REVISION
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DATE
5/21/2015

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:	TM2.23.TN-2HDJL-X	Sheet 2
B. Franklin	2/15/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015		



BILL OF MATERIAL (Type of CU: POLE)				
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-2HDOB
1	24	EA	1000910800	NUT LCK MF SQ 7/8 BOLT GALV
2	12	EA	6000273770	NUT SQ 7/8" BOLT GALV
3	6	EA	1035475016	BOLT SQ HEAD 7/8 X 16 W/ SQ NUT (NOTE F)
4	18	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE F)
5	24	EA	6000274612	WASHER HELICAL (7/8")
6	12	EA	6000274880	WASHER 4" SQ CURVED (7/8")
7	4	EA	1005259000	GRIP PRFRMD GUY 19#8 AWLD
8	55	FT	6000252362	WIRE ALWD GUY 19#8
9	4	EA	1010145562	THMBL ROLLER 3-1/4" DIA 1-1/16" H
10	2	EA	6000274527	TURNBUCKLE, 7/8 X 27 (+/- 6 IN), JAW-ROD, 30K
11	8	EA	1039220531	SHCKL ANCH 7/8 BNK 1-1/4 OPNG
12	5	EA	6000274040	PLT POLE EYE 15/16 H
13	15	EA	6000274505	DEAD END TEE, 60K
14	15	EA	6000273231	GAIN GRID, 4-1/2" X 9", BONDING F/ 7/8 BOLTS
15	12	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
16	3	EA	1036232100	CONN 1B W/SPCR
17	4	EA	6000113887	CONN COMP #2 SOL - 19#8 AWLD
18	3	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: INSO) - SINGLE CONDUCTOR PER PHASE				
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-17
19	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (17 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-O
19	6	EA	6000312023	INS POLY Y-BALL 30K 17 UNIT EQ. W/COR RING

ADDITIONAL BILL OF MATERIAL (Type of CU: INSO) - TWO CONDUCTORS PER PHASE				
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-17
19	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (17 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-O
19	6	EA	6000312023	INS POLY Y-BALL 30K 17 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
 - TH GUYING ASSEMBLIES
 - TK MARKINGS
 - TR GUY ANCHORS

NOTE B: POLE DRILLING: ALL HOLES - 15/16" DIAMETER

NOTE C: IF CONDUCTOR NESC HEAVY LOADING TENSION IS LESS THAN 10,000#, USE STRAIN CLAMPS; IF NESC TENSION IS 10,000# OR GREATER, USE COMPRESSION DEAD END ASSEMBLIES.

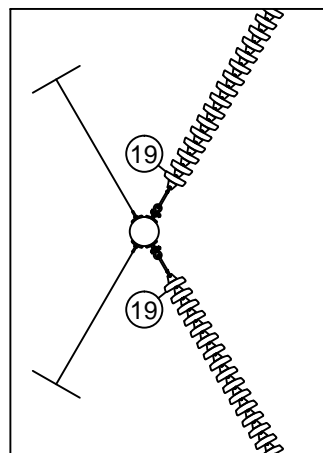
NOTE D: GUYING ANGLES SHOWN ARE GUIDELINES. IF THE SPECIFIC FIELD CONDITIONS IN THE AREA WHERE THIS STRUCTURE IS INSTALLED DO NOT ACCOMMODATE THIS GUYING ARRANGEMENT THEN THE CHANGES TO THE GUYING ARRANGEMENT SHALL BE NOTED ON THE RESPECTIVE PLAN AND PROFILE DRAWING.

NOTE E: IF POLE SPACING IS DIFFERENT IT SHALL BE NOTED ON THE PLAN AND PROFILE DRAWINGS.

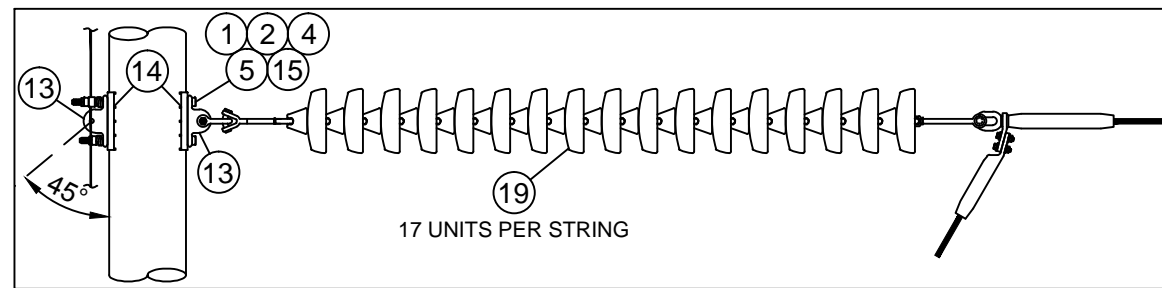
NOTE F: LARGER OR SMALLER BOLTS MAY BE REQUIRED DEPENDING ON THE DIAMETER OF THE POLE USED. SUBSTITUTE MATERIAL ID (MID) ON THE WORK ORDER COMPONENTS PAGE FOR THE LENGTH NEEDED IF DIFFERENT THAN THE GENERIC LENGTH SHOWN IN THE BILL OF MATERIALS. CONTACT SYSTEM ENGINEERING - TRANSMISSION SECTION IF YOU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

NOTE G: USE A STEEL DEADEND STRUCTURE WHEN USING BUNDLED CONDUCTOR CONFIGURATION.

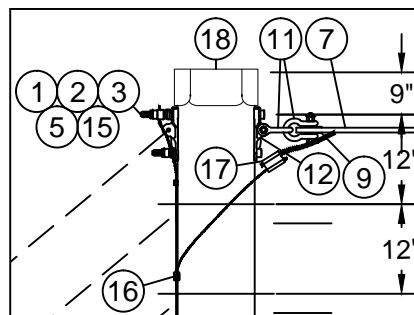
THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY				
Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.				Drawing Scale: N/A
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	REVISION 00 DATE 5/21/2015			
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:
B. Franklin	2/15/2013	Becken/Hart	3/18/2015	Barry R. Hart
Date App.:				5/20/2015
TM2.23.TN-2HDOB-X				Sheet 1



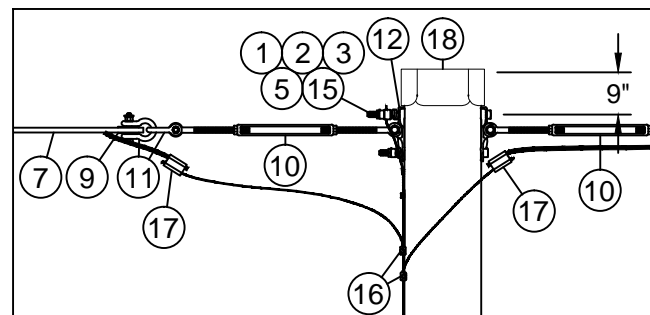
VIEW A-A



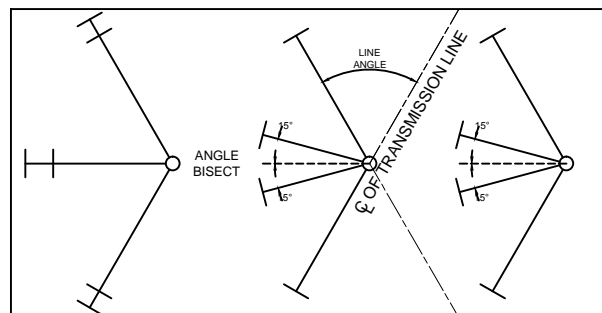
Detail 'A'
(ASSEMBLY FOR COMPRESSION CLAMP SINGLE CONDUCTOR PER PHASE SHOWN)



Detail 'B'



Detail 'C'



GUYING PLAN

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

BILL OF MATERIAL WITH STRAIN CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2HDOBC-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-N2L1-X	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2HDOBC-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2L1-X	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2HDOBC-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2L1-X	TP-W-AU-G-H TO-W-AD-G-S
C*M-TN2HDOBC-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-N2L1-K	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2HDOBC-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2L1-K	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2HDOBC-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2L1-K	TP-W-AU-G-H TO-W-AD-G-S
C*M-TN2HDOBC-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-N2L1-L	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2HDOBC-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2L1-L	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2HDOBC-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2L1-L	TP-W-AU-G-H TO-W-AD-G-S

BILL OF MATERIAL WITH COMPRESSION DEADEND CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2HDOBD-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-C2-X	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2HDOBD-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2-X	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2HDOBD-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2-X	TP-W-AU-G-H TO-W-AD-G-S
C*M-TN2HDOBD-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-C2-K	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2HDOBD-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2-K	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2HDOBD-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2-K	TP-W-AU-G-H TO-W-AD-G-S
C*M-TN2HDOBD-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-C2-L	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2HDOBD-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2-L	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2HDOBD-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2-L	TP-W-AU-G-H TO-W-AD-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*_).

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

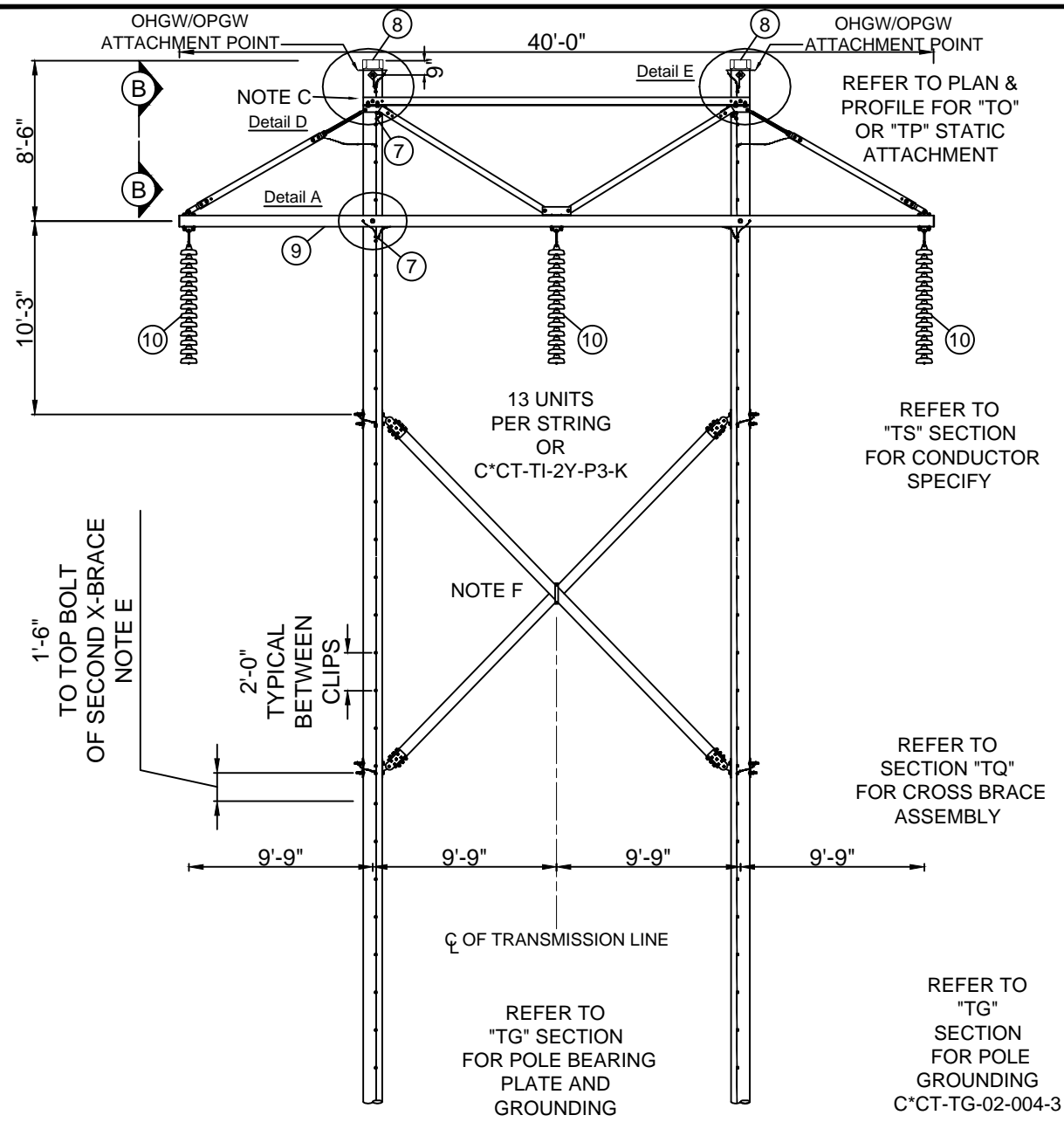
STRUCTURE STANDARDS - WOOD
230KV H-FRAME SINGLE CIRCUIT
ANGLE DEAD END 60° AND GREATER

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-2HDOB-X

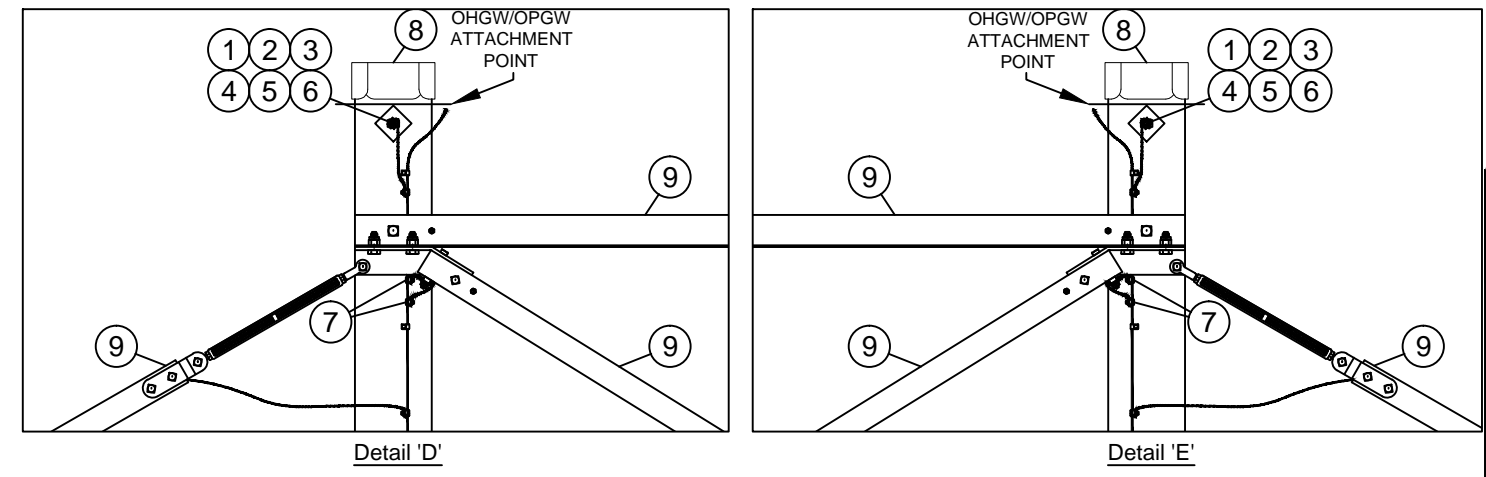
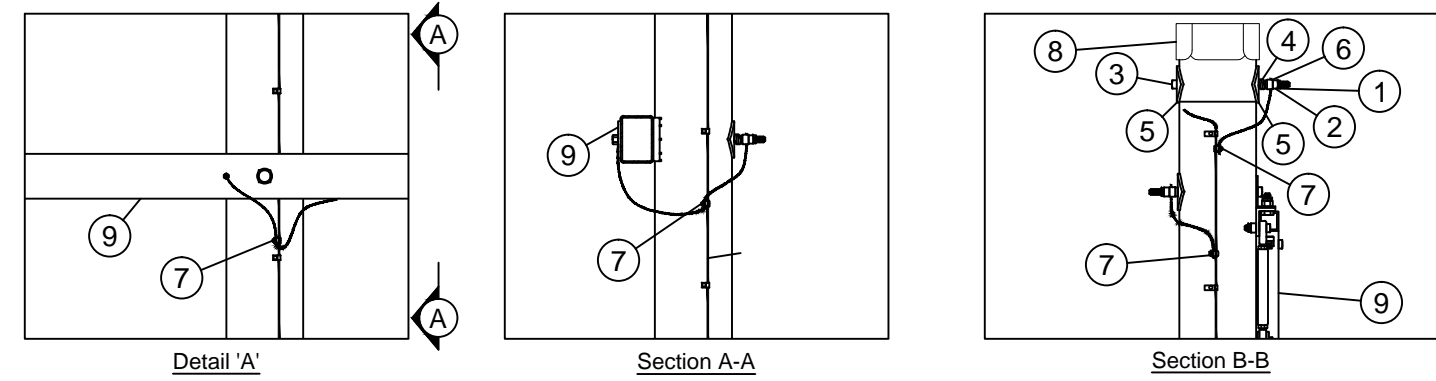
Sheet 2



BILL OF MATERIAL (Type of CU: POLE)				
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-2HHTB
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 E)
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	15	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-2S-A-FC40
9	1 CU	EA	1036235440	SINGLE CROSSARM, STEEL, 7" X 7" X 40'-0"

BILL OF MATERIAL (Type of CU: INSO)				
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-13
10	3 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (13 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-K
10	3	EA	6000312031	INS POLY Y-BALL 30K 13 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
 XARM 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: 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 F: STRUCTURES USING 80' LONG POLES OR LONGER REQUIRE (2) CROSS BRACES, REFER TO SECTION TQ FOR ADDITIONAL CROSS BRACE ASSEMBLY.

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 230kv H-FRAME SINGLE CIRCUIT TANGENT SUSPENSION STRUCTURE - SINGLE STEEL ARM	REVISION 00
	DATE 5/21/2015	DATE 5/21/2015	DATE 5/21/2015
Drwn. By: B. Franklin	Date Dr.: 5/22/2013	Checked By: Becken/Hart	Date Ck.: 1/22/2015
Approved By: Barry R. Hart	Date App.: 3/12/2015	TM2.23.TN-2HHTB-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-TN2HHTB-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-S1A1-X	(2) TP-W-TS-G-H
C*M-TN2HHTB-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD	TS-S1A1-X	TP-W-TS-G-H
		(1) - 36 FIBER OPGW		TO-W-TS-G-O
C*M-TN2HHTB-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD	TS-S1A1-X	TP-W-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-TS-G-S
C*M-TN2HHTB-K-H2	(3) - 1192 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S1A1-K	(2) TP-W-TS-G-H
C*M-TN2HHTB-K-HO	(3) - 1192 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S1A1-K	TP-W-TS-G-H
		(1) - 36 FIBER OPGW		TO-W-TS-G-O
C*M-TN2HHTB-K-HS	(3) - 1192 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S1A1-K	TP-W-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-TS-G-S
C*M-TN2HHTB-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S1A1-L	(2) TP-W-TS-G-H
C*M-TN2HHTB-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S1A1-L	TP-W-TS-G-H
		(1) - 36 FIBER OPGW		TO-W-TS-G-O
C*M-TN2HHTB-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S1A1-L	TP-W-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-TS-G-S
C*M-TN2IHTB-X2H2	(6) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-S2A2Y1-X	(2) TP-W-TS-G-H
C*M-TN2IHTB-X2HO	(6) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD	TS-S2A2Y1-X	TP-W-TS-G-H
		(1) - 36 FIBER OPGW		TO-W-TS-G-O
C*M-TN2IHTB-X2HS	(6) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD	TS-S2A2Y1-X	TP-W-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-TS-G-S
C*M-TN2IHTB-K2H2	(6) - 1192 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2Y1-K	(2) TP-W-TS-G-H
C*M-TN2IHTB-K2HO	(6) - 1192 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2Y1-K	TP-W-TS-G-H
		(1) - 36 FIBER OPGW		TO-W-TS-G-O
C*M-TN2IHTB-K2HS	(6) - 1192 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2Y1-K	TP-W-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-TS-G-S
C*M-TN2IHTB-L2H2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2Y1-L	(2) TP-W-TS-G-H
C*M-TN2IHTB-L2HO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2Y1-L	TP-W-TS-G-H
		(1) - 36 FIBER OPGW		TO-W-TS-G-O
C*M-TN2IHTB-L2HS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2Y1-L	TP-W-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		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*_).

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
230kV H-FRAME SINGLE CIRCUIT
TANGENT SUSPENSION STRUCTURE - SINGLE STEEL ARM

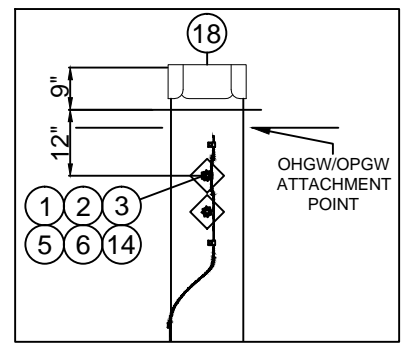
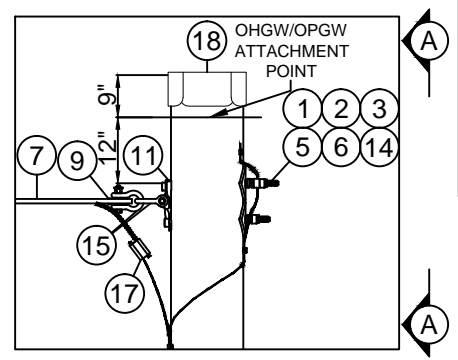
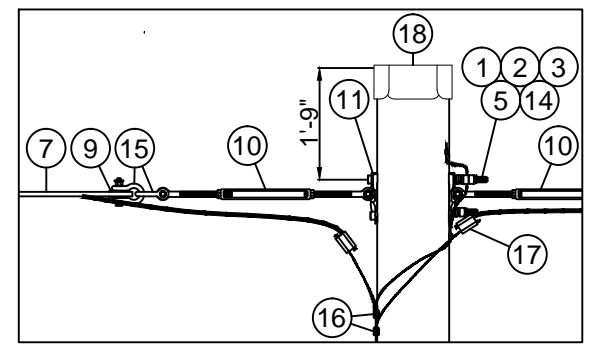
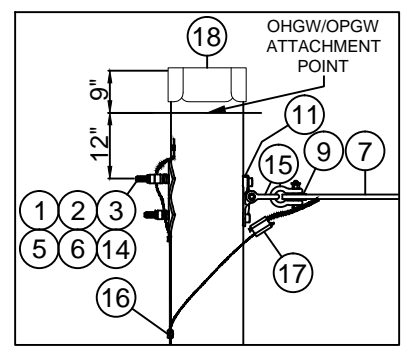
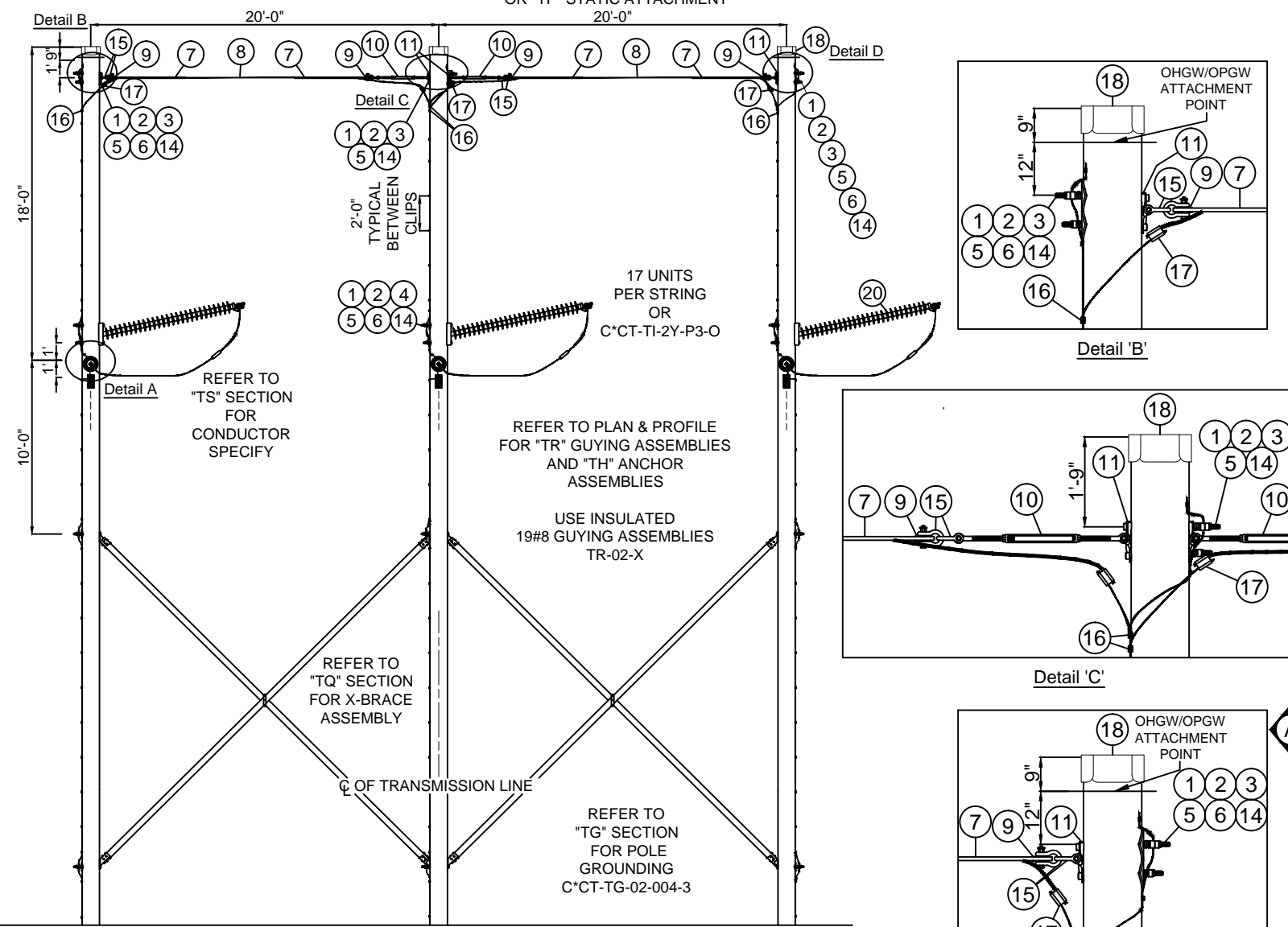
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5/21/2015

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
B. Franklin	5/22/2013	Becken/Hart	1/22/2015	Barry R. Hart	3/12/2015

TM2.23.TN-2HHTB-X

Sheet 2

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



BILL OF MATERIAL (CU Type: POLE)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-2HHYL
1	24	EA	1000910800	NUT LCK MF SQ 7/8 BOLT GALV
2	12	EA	6000273770	NUT SQ 7/8 BOLT GALV
3	6	EA	1035475016	BOLT SQ HEAD 7/8 X 16 W/ SQ NUT (NOTE F)
4	18	EA	1035475022	BOLT SQ HEAD 7/8 X 22 W/ SQ NUT (NOTE F)
5	24	EA	6000274612	WASHER HELICAL (7/8")
6	10	EA	6000274880	WASHER 4" SQ CURVED (7/8")
7	4	EA	1005259000	GRIP PRFRMD GUY 19#8 AWLD
8	50	EA	6000252362	WIRE ALWD GUY 19#8
9	4	EA	1010145562	THMBL ROLLER 3-1/4" DIA 1-1/16" H
10	2	EA	6000274527	TURNBUCKLE, 7/8 X 27 (+/- 6 IN), JAW-ROD, 30K
11	4	EA	6000274040	PLT POLE EYE 15/16 H
12	12	EA	6000274505	DEAD END TEE, 60K
13	12	EA	6000273231	GAIN GRID, 4-1/2" X 9", BONDING F/ 7/8 BOLTS
14	12	EA	1036200007	CLMP GRD WIRE U-CLIP 15/16" H
15	8	EA	1039220531	SHCKL ANCH 7/8 BNK 1-1/4 OPNG
16	4	EA	1036232100	CONN 1B W/SPCR
17	4	EA	6000113887	CONN COMP #2 SOL - 19#8 AWLD
18	3	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (CU Type: INSO) - SINGLE CONDUCTOR PER PHASE

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-17
19	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (17 UNITS/STRING)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-O
19	6	EA	6000312023	INS POLY Y-BALL 30K 17 UNIT EQ. W/COR RING

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-HC
20	3	EA	6000310281	INS LINE POST 230KV W/ CLAMP FITTING & GAIN BASE

ADDITIONAL BILL OF MATERIAL (CU Type: INSO) - TWO CONDUCTORS PER PHASE

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-17
19	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (17 UNITS/STRING)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-O
19	6	EA	6000312023	INS POLY Y-BALL 30K 17 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
 - TH GUYING ASSEMBLIES
 - TK MARKINGS
 - TR GUY ANCHORS

NOTE B: POLE DRILLING: ALL HOLES - 15/16" DIAMETER

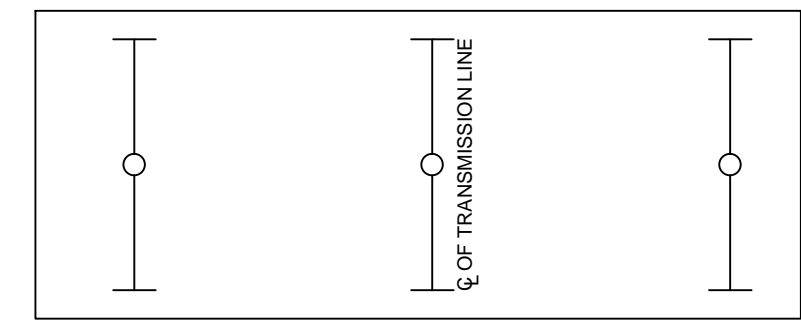
NOTE C: IF CONDUCTOR NESC HEAVY LOADING TENSION IS LESS THAN 10,000#, USE STRAIN CLAMPS; IF NESC TENSION IS 10,000# OR GREATER, USE COMPRESSION DEAD END ASSEMBLIES.

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

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.

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 SYSTEM ENGINEERING - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

NOTE G: USE A STEEL DEADEND STRUCTURE WHEN USING BUNDLED CONDUCTOR CONFIGURATION.



GUYING PLAN

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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 230KV H-FRAME SINGLE CIRCUIT TANGENT DEADEND STRUCTURE		REVISION 00
	Drwn. By: B. Franklin Date Dr.: 2/14/2013	Checked By: Becken/Hart	Date Ck.: 3/18/2015	Approved By: Barry R. Hart Date App.: 5/20/2015
TM2.23.TN-2HHYL-X				Sheet 1

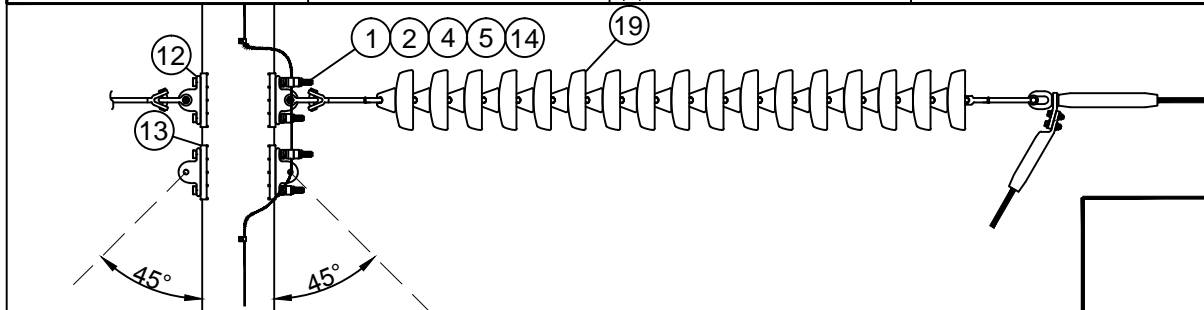
USE THE MACRO CUs INSTEAD OF INDIVIDUAL CU COMPONENTS FOR EASE OF WORK ORDER ENTRY.

BILL OF MATERIAL WITH STRAIN CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2HHYLF-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-X	(2) TP-W-DE-G-H
C*M-TN2HHYLF-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-X	TP-W-DE-G-H TO-W-DE-G-O
C*M-TN2HHYLF-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-X	TP-W-DE-G-H TO-W-DE-G-S
C*M-TN2HHYLF-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-K	(2) TP-W-DE-G-H
C*M-TN2HHYLF-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-K	TP-W-DE-G-H TO-W-DE-G-O
C*M-TN2HHYLF-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-K	TP-W-DE-G-H TO-W-DE-G-S
C*M-TN2HHYLF-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-L	(2) TP-W-DE-G-H
C*M-TN2HHYLF-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-L	TP-W-DE-G-H TO-W-DE-G-O
C*M-TN2HHYLF-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-L	TP-W-DE-G-H TO-W-DE-G-S

BILL OF MATERIAL WITH COMPRESSION DEADEND CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2HHYLG-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-C2P1-X	(2) TP-W-DE-G-H
C*M-TN2HHYLG-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-X	TP-W-DE-G-H TO-W-DE-G-O
C*M-TN2HHYLG-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-X	TP-W-DE-G-H TO-W-DE-G-S
C*M-TN2HHYLG-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-C2P1-K	(2) TP-W-DE-G-H
C*M-TN2HHYLG-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-K	TP-W-DE-G-H TO-W-DE-G-O
C*M-TN2HHYLG-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-K	TP-W-DE-G-H TO-W-DE-G-S
C*M-TN2HHYLG-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-C2P1-L	(2) TP-W-DE-G-H
C*M-TN2HHYLG-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-L	TP-W-DE-G-H TO-W-DE-G-O
C*M-TN2HHYLG-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-L	TP-W-DE-G-H TO-W-DE-G-S



Detail 'A'

(ASSEMBLY FOR COMPRESSION CLAMP SINGLE CONDUCTOR PER PHASE SHOWN)

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

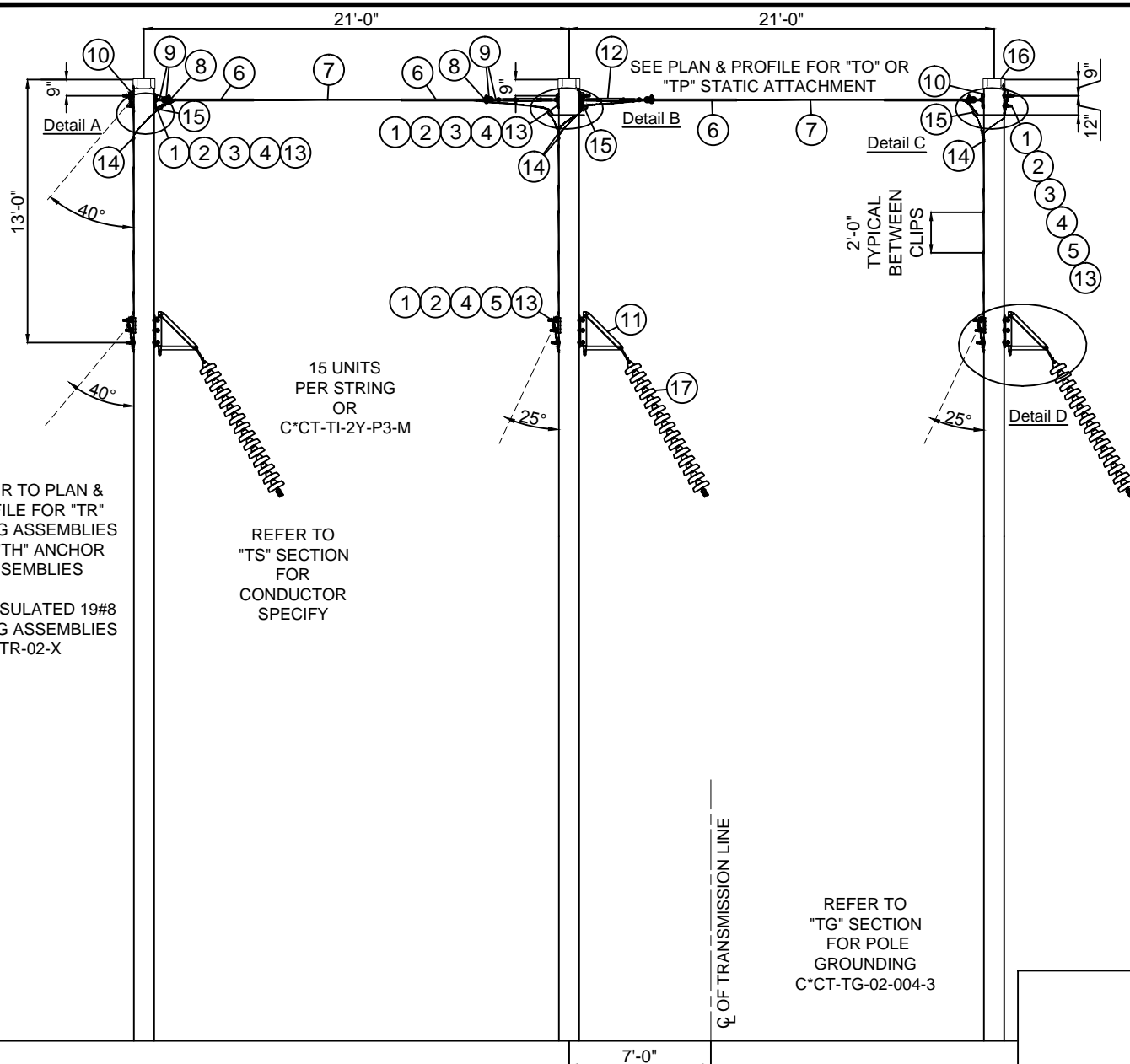
STRUCTURE STANDARDS - WOOD
230kV H-FRAME SINGLE CIRCUIT
TANGENT DEADEND STRUCTURE

REVISION
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DATE
5/21/2015

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
B. Franklin	2/14/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015

TM2.23.TN-2HHYL-X

Sheet 2



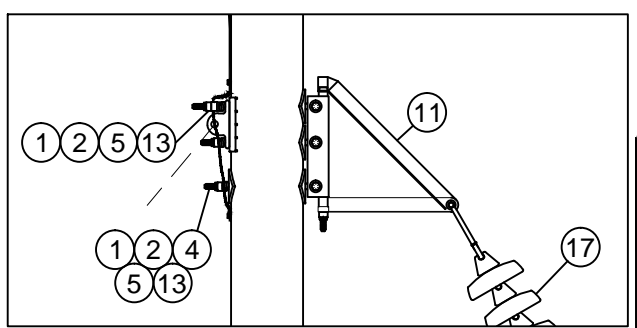
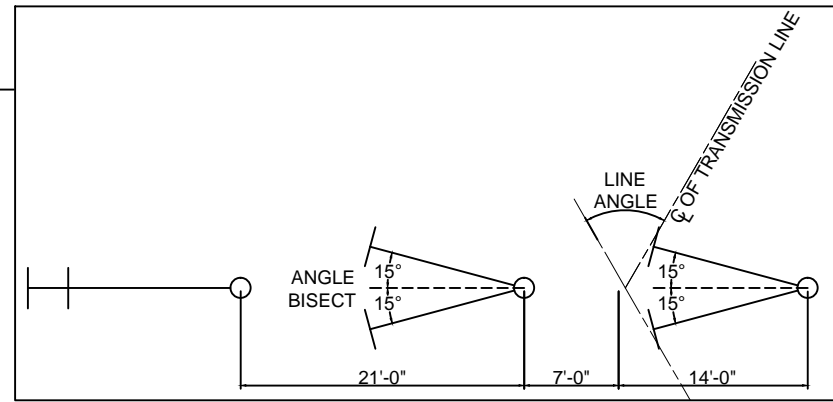
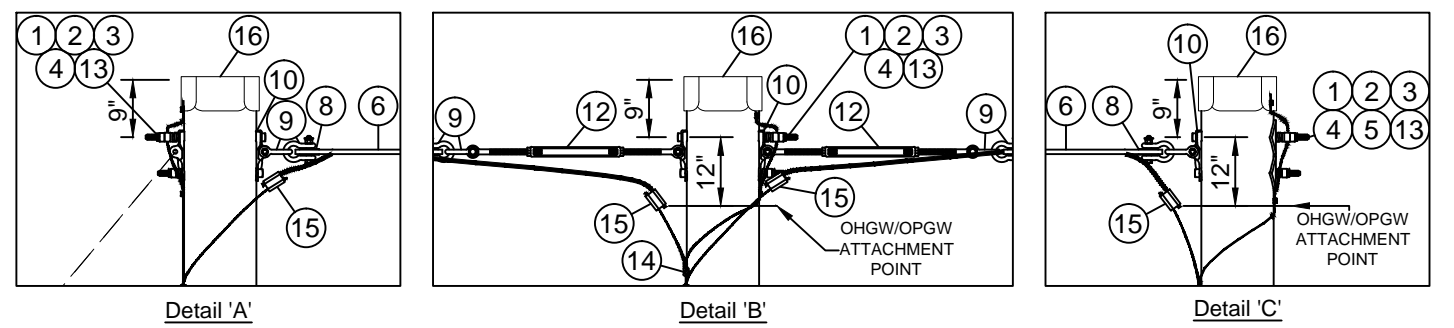
REFER TO PLAN & PROFILE FOR "TR" GUYING ASSEMBLIES AND "TH" ANCHOR ASSEMBLIES
 USE INSULATED 19#8 GUYING ASSEMBLIES TR-02-X

REFER TO "TS" SECTION FOR CONDUCTOR SPECIFY

REFER TO "TG" SECTION FOR POLE GROUNDING C*CT-TG-02-004-3

BILL OF MATERIAL (CU Type: POLE)					
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-2HSBB	
1	15	EA	1000910800	NUT LCK MF SQ 7/8 BOLT GALV	
2	6	EA	6000273770	NUT SQ 7/8 BOLT GALV	
3	6	EA	1035475016	BOLT SQ HEAD 7/8 X 16 W/ SQ NUT (NOTE E)	
4	15	EA	6000274612	WASHER HELICAL (7/8")	
5	14	EA	6000274880	WASHER 4" SQ CURVED (7/8")	
6	4	EA	1005259000	GRIP PRFRMD GUY 19#8 AWLD	
7	45	EA	6000252362	WIRE ALWD GUY 19#8	
8	4	EA	1010145562	THMBL ROLLER 3-1/4" DIA 1-1/16" H	
9	8	EA	1039220531	SHCKL ANCH 7/8 BNK 1-1/4 OPNG	
10	5	EA	6000274040	PLT POLE EYE 15/16 H	
11	3	EA	6000250716	SWINGING ANGLE BRACKET (NOTE F)	
12	2	EA	6000274527	TURNBUCKLE, 7/8 X 27 (+/- 6 IN), JAW-ROD, 30K	
13	6	EA	1036200007	CLMP GRD WIRE U-CLIP 15/16" H	
14	4	EA	1036232100	CONN 1B W/SPCR	
15	4	EA	6000113887	CONN COMP #2 SOL - 19#8 AWLD	
16	3	EA	6000820052	POLE TOPPER 19"	

BILL OF MATERIAL (CU Type: INSO)					
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-15	
17	3 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (15 UNITS/STRING)	
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-M	
17	3	EA	6000312037	INS POLY Y-BALL 30K 15 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
 - TH GUYING ASSEMBLIES
 - TK MARKINGS
 - TR GUY ANCHORS

NOTE B: POLE DRILLING: ALL HOLES - 15/16" DIAMETER

NOTE C: 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 D: REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.

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 SYSTEM ENGINEERING - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

NOTE F: SWINGING ANGLE BRACKET SUPPLIED WITH MOUNTING BOLTS, CHANNEL, DEAD END TEE AND GAIN. DO NOT USE GAIN FOR LAMINATED POLES.

NOTE G: IF POLE SPACING IS ANYTHING OTHER THAN 21' IT SHALL BE NOTED ON THE 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: N/A	
	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - WOOD 230KV H-FRAME SINGLE CIRCUIT ANGLE SUSPENSION STRUCTURE - SWINGING BRACKETS FOR ANGLES 5° TO 20°			REVISION 00
					DATE 5/21/2015
Drwn. By: B. Franklin	Date Dr.: 2/14/2013	Checked By: Becken/Hart	Date Ck.: 3/18/2015	Approved By: Barry R. Hart	Date App.: 5/20/2015
TM2.23.TN-2HSBB-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-TN2HSBB-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-S1A1-X	(2) TP-W-TS-G-H
C*M-TN2HSBB-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD	TS-S1A1-X	TP-W-TS-G-H
		(1) - 36 FIBER OPGW		TO-W-TS-G-O
C*M-TN2HSBB-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD	TS-S1A1-X	TP-W-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-TS-G-S
C*M-TN2HSBB-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S1A1-K	(2) TP-W-TS-G-H
		(1) - 7#7 (7/16") AWLD		TP-W-TS-G-H
C*M-TN2HSBB-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD	TS-S1A1-K	TP-W-TS-G-H
		(1) - 36 FIBER OPGW		TO-W-TS-G-O
C*M-TN2HSBB-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD	TS-S1A1-K	TP-W-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-TS-G-S
C*M-TN2HSBB-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S1A1-L	(2) TP-W-TS-G-H
		(1) - 7#7 (7/16") AWLD		TP-W-TS-G-H
C*M-TN2HSBB-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S1A1-L	TP-W-TS-G-H
		(1) - 36 FIBER OPGW		TO-W-TS-G-O
C*M-TN2HSBB-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S1A1-L	TP-W-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-TS-G-S
C*M-TN2ISBB-X2H2	(6) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-S2A2Z1-X	(2) TP-W-TS-G-H
		(1) - 7#7 (7/16") AWLD		TP-W-TS-G-H
C*M-TN2ISBB-X2HO	(6) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD	TS-S2A2Z1-X	TP-W-TS-G-H
		(1) - 36 FIBER OPGW		TO-W-TS-G-O
C*M-TN2ISBB-X2HS	(6) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD	TS-S2A2Z1-X	TP-W-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-TS-G-S
C*M-TN2ISBB-K2H2	(6) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S2A2Z1-K	(2) TP-W-TS-G-H
		(1) - 7#7 (7/16") AWLD		TP-W-TS-G-H
C*M-TN2ISBB-K2HO	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD	TS-S2A2Z1-K	TP-W-TS-G-H
		(1) - 36 FIBER OPGW		TO-W-TS-G-O
C*M-TN2ISBB-K2HS	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD	TS-S2A2Z1-K	TP-W-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-TS-G-S
C*M-TN2ISBB-L2H2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2Z1-L	(2) TP-W-TS-G-H
		(1) - 7#7 (7/16") AWLD		TP-W-TS-G-H
C*M-TN2ISBB-L2HO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2Z1-L	TP-W-TS-G-H
		(1) - 36 FIBER OPGW		TO-W-TS-G-O
C*M-TN2ISBB-L2HS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2Z1-L	TP-W-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		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*_).

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

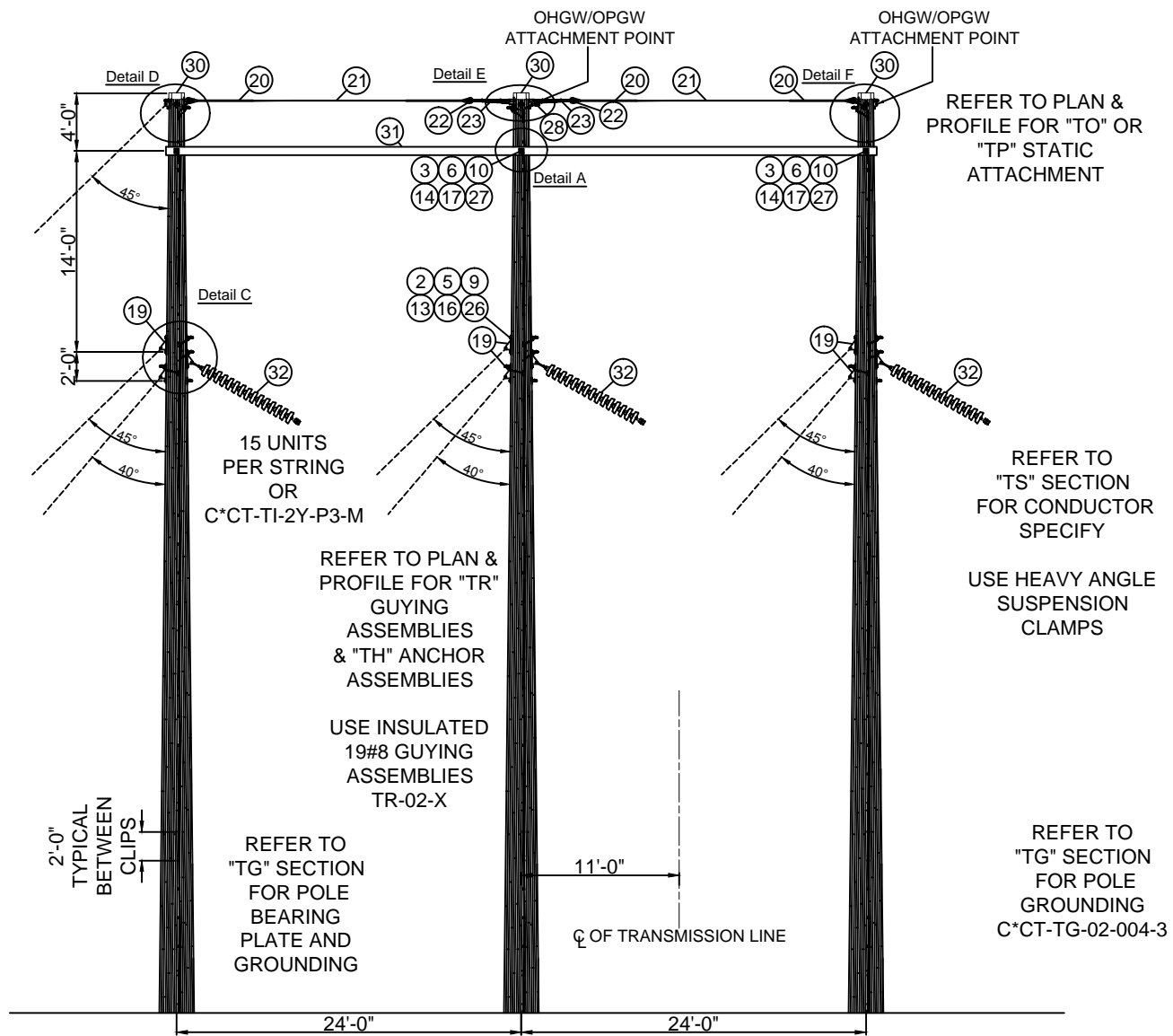
STRUCTURE STANDARDS - WOOD
230kV H-FRAME SINGLE CIRCUIT
ANGLE SUSPENSION STRUCTURE - SWINGING BRACKETS
FOR ANGLES 5° TO 20°

REVISION
00
DATE
5/21/2015

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
B. Franklin	2/14/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015

TM2.23.TN-2HSBB-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
 TH GUYING ASSEMBLIES
 TK MARKINGS
 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: 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 D: REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.

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 SYSTEM ENGINEERING - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

NOTE F: MOUNTING BOLTS, NUTS AND WASHERS ARE PROVIDED WITH THE SPACER ASSEMBLY.

NOTE G: USE A STEEL DEADEND STRUCTURE WHEN USING BUNDLED CONDUCTOR CONFIGURATION.

BILL OF MATERIAL (Type of CU: POLE)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-2JA0B
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 E)
8	6	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE E)
9	12	EA	1035476024	BOLT SQ HEAD 1 X 24 W/ SQ NUT (NOTE E)
10	3	EA	6000272050	BOLT SQ HEAD 1-1/4 X 28 W/ SQ NUT (NOTE E)
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-ROD, 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	20	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)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TT-2S-B-FC50
31	1 CU	EA	1036235426	SINGLE CROSSARM, STEEL, 7" X 7" X 50'

BILL OF MATERIAL - SINGLE CONDUCTOR PER PHASE (Type of CU: INSO)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-15
32	3 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (15 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-M
32	3	EA	6000312037	INS POLY Y-BALL 30K 15 UNIT EQ. W/COR RING

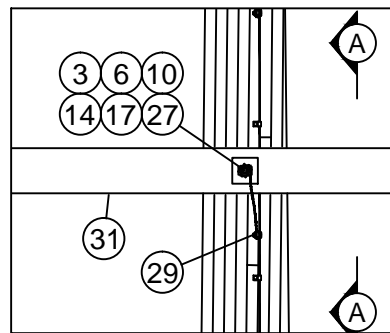
ADDITIONAL BILL OF MATERIAL - TWO CONDUCTORS PER PHASE (Type of CU: INSO)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-15
32	3 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (15 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-M
32	3	EA	6000312037	INS POLY Y-BALL 30K 15 UNIT EQ. W/COR RING

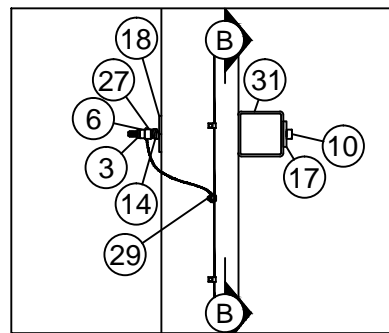
THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

Contact Engineering Standards - Transmission Section for the creation of new standards and CUs. Drawing Scale: N/A

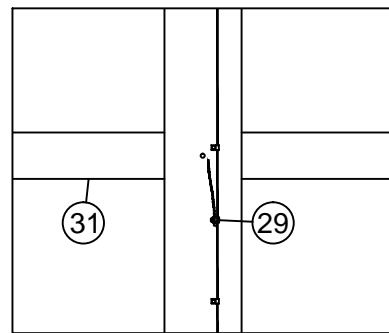
	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - LAMINATED WOOD 230KV H-FRAME SINGLE CIRCUIT H-FRAME RUNNING ANGLE - 30° TO 45° SINGLE STEEL CROSSARM	REVISION
			00
			DATE
			5/21/2015
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:
B. Franklin	2/14/2013	Becken/Hart	3/18/2015
Approved By:	Date App.:	TM2.23.TN-2JA0B-X	
Barry R. Hart	5/20/2015	Sheet 1	



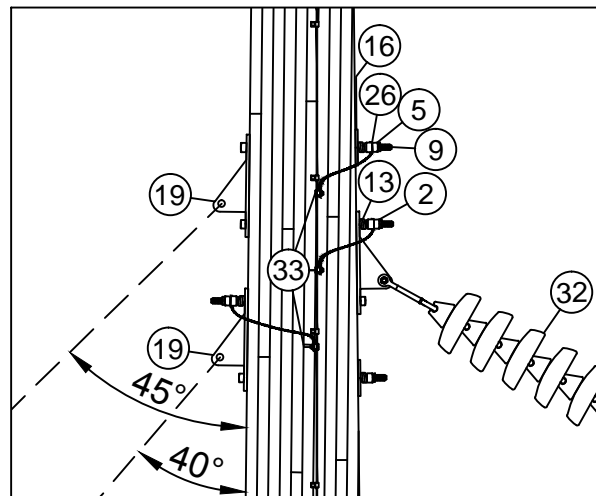
Detail 'A'



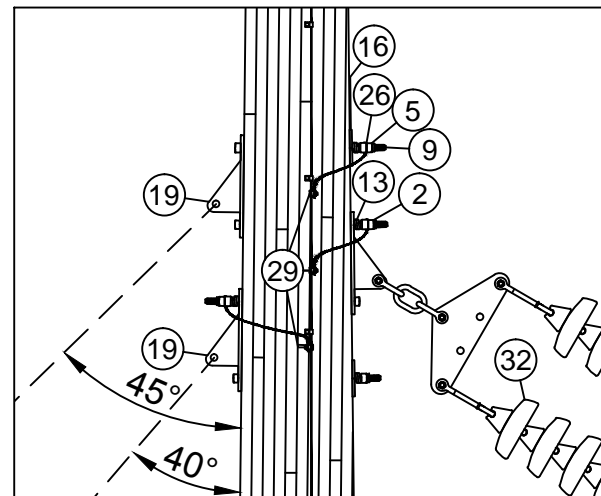
Section A-A



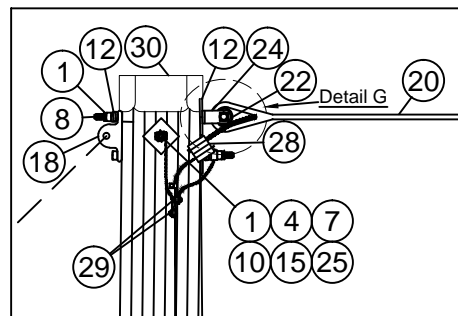
Section B-B



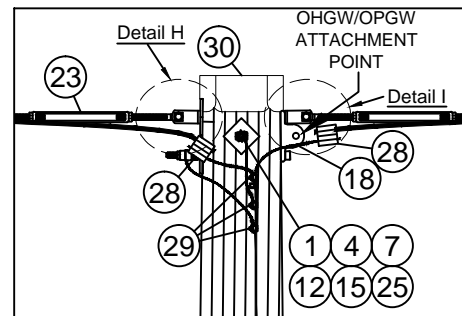
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SINGLE CONDUCTOR PER PHASE



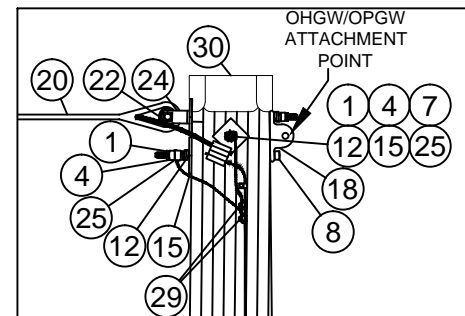
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TWO CONDUCTORS PER PHASE



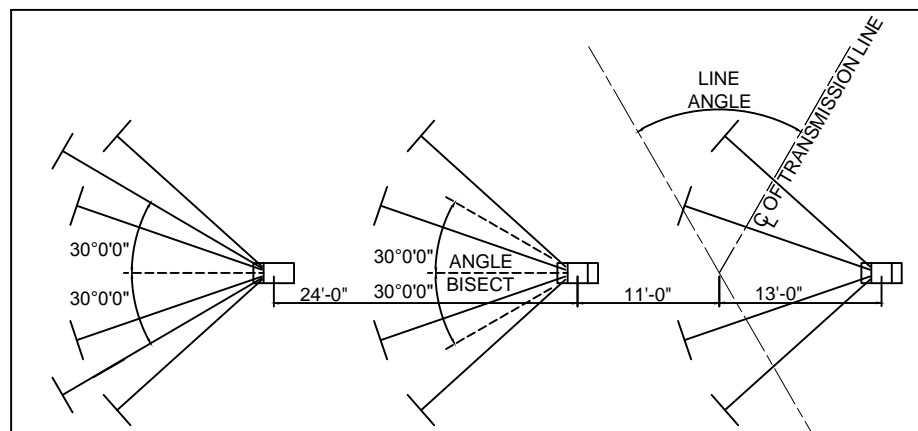
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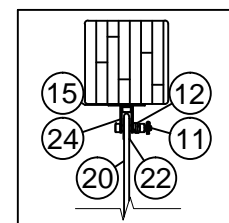
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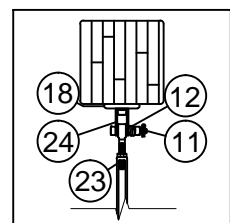
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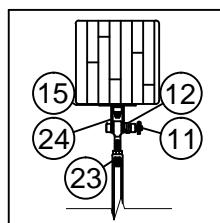
GUYING PLAN



Detail 'G'



Detail 'H'



Detail 'I'

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-TN2JA0BA-X2H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-S4A1-X	(2) TP-W-A1-G-H
C*M-TN2JA0BA-X2HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S4A1-X	TP-W-A1-G-H TO-W-A2-G-O
C*M-TN2JA0BA-X2HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S4A1-X	TP-W-A1-G-H TO-W-A2-G-S
C*M-TN2JA0BA-K2H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S4A1-K	(2) TP-W-A1-G-H
C*M-TN2JA0BA-K2HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S4A1-K	TP-W-A1-G-H TO-W-A2-G-O
C*M-TN2JA0BA-K2HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S4A1-K	TP-W-A1-G-H TO-W-A2-G-S
C*M-TN2JA0BA-L2H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S4A1-L	(2) TP-W-A1-G-H
C*M-TN2JA0BA-L2HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S4A1-L	TP-W-A1-G-H TO-W-A2-G-O
C*M-TN2JA0BA-L2HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S4A1-L	TP-W-A1-G-H TO-W-A2-G-S
C*M-TN2KA0BA-X2B2	(6) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-S5A2D1-X	(2) TP-W-A1-G-H
C*M-TN2KA0BA-X2BO	(6) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S5A2D1-X	TP-W-A1-G-H TO-W-A2-G-O
C*M-TN2KA0BA-X2BS	(6) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S5A2D1-X	TP-W-A1-G-H TO-W-A2-G-S
C*M-TN2KA0BA-K2B2	(6) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S5A2D1-K	(2) TP-W-A1-G-H
C*M-TN2KA0BA-K2BO	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S5A2D1-K	TP-W-A1-G-H TO-W-A2-G-O
C*M-TN2KA0BA-K2BS	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S5A2D1-K	TP-W-A1-G-H TO-W-A2-G-S
C*M-TN2KA0BA-L2B2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S5A2D1-L	(2) TP-W-A1-G-H
C*M-TN2KA0BA-L2BO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S5A2D1-L	TP-W-A1-G-H TO-W-A2-G-O
C*M-TN2KA0BA-L2BS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S5A2D1-L	TP-W-A1-G-H TO-W-A2-G-S

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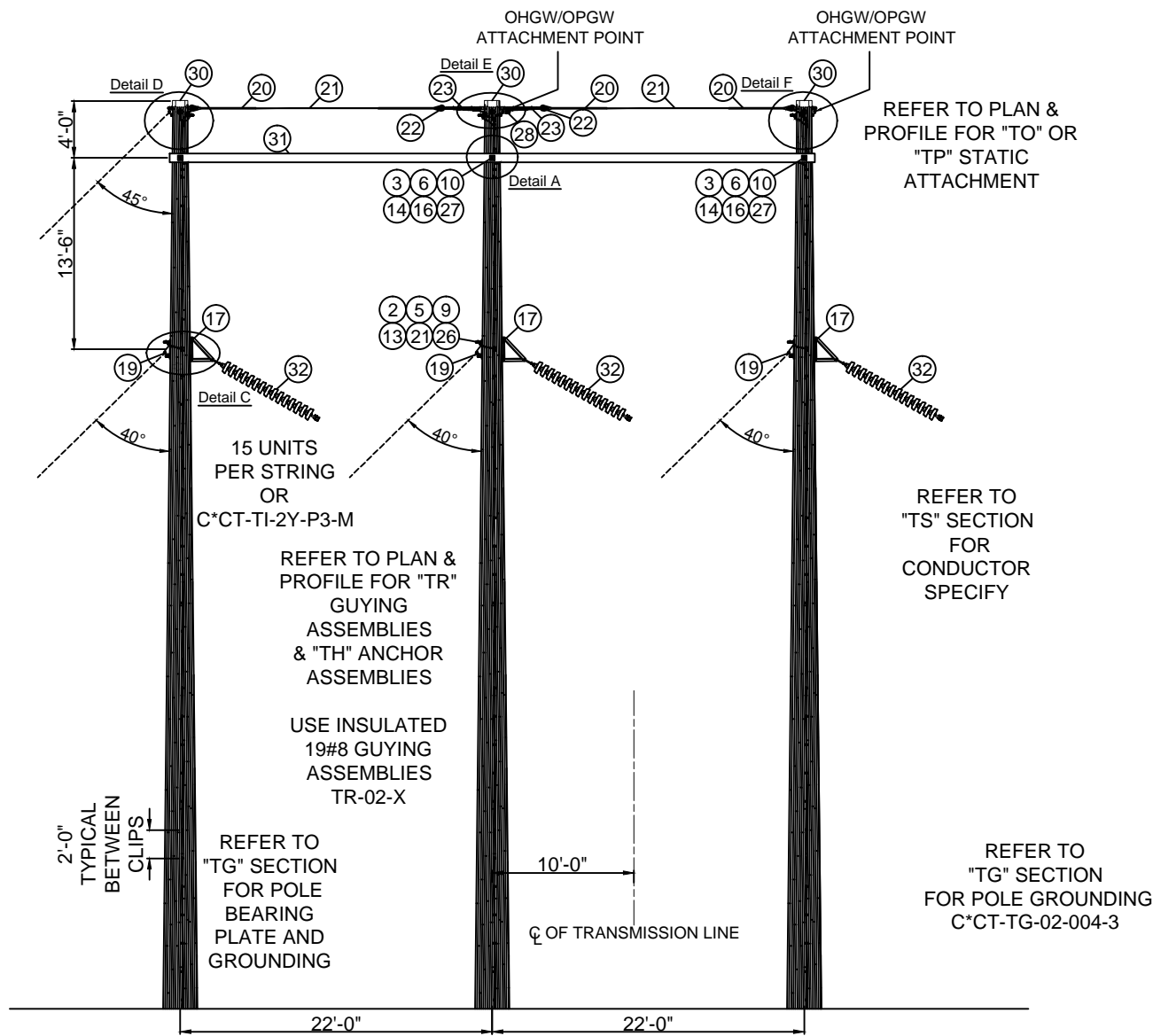
Contact Engineering Standards - Transmission Section for the creation of new standards and CUs. Drawing Scale: N/A

	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - LAMINATED WOOD 230KV H-FRAME SINGLE CIRCUIT H-FRAME RUNNING ANGLE - 30° TO 45° SINGLE STEEL CROSSARM	REVISION
			00
Drwn. By: B. Franklin	Date Dr.: 2/14/2013	Checked By: Becken/Hart	Date Ck.: 3/18/2015
Approved By: Barry R. Hart	Date App.: 5/20/2015	TM2.23.TN-2JA0B-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*_).

REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.



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
 TH GUYING ASSEMBLIES
 TK MARKINGS
 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: 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 D: REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.

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 SYSTEM ENGINEERING - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

NOTE F: MOUNTING BOLTS, NUTS AND WASHERS ARE PROVIDED WITH THE SPACER ASSEMBLY.

NOTE G: USE A STEEL DEADEND STRUCTURE WHEN USING BUNDLED CONDUCTOR CONFIGURATION.

BILL OF MATERIAL (Type of CU: POLE)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-2JA9B
1	9	EA	1000910800	NUT LCK MF SQ 7/8" BOLT GALV
2	6	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 E)
8	6	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE E)
9	6	EA	1035476024	BOLT SQ HEAD 1 X 24 W/ SQ NUT (NOTE E)
10	3	EA	6000272050	BOLT SQ HEAD 1-1/4 X 28 W/ SQ NUT (NOTE E)
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-ROD, 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)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TT-2S-B-FC46
31	1 CU	EA	1036235420	SINGLE CROSSARM, STEEL, 7" X 7" X 46'

BILL OF MATERIAL - SINGLE CONDUCTOR PER PHASE (Type of CU: INSO)

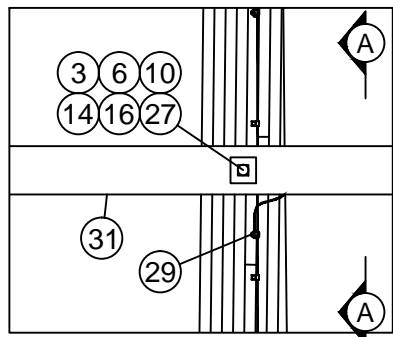
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-15
32	3 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (15 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-M
32	3	EA	6000312037	INS POLY Y-BALL 30K 15 UNIT EQ. W/COR RING

ADDITIONAL BILL OF MATERIAL - TWO CONDUCTORS PER PHASE (Type of CU: INSO)

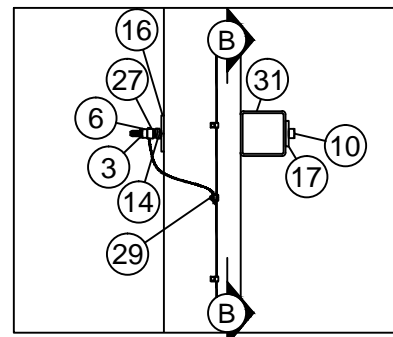
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-15
32	3 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (15 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-M
32	3	EA	6000312037	INS POLY Y-BALL 30K 15 UNIT EQ. W/COR RING

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

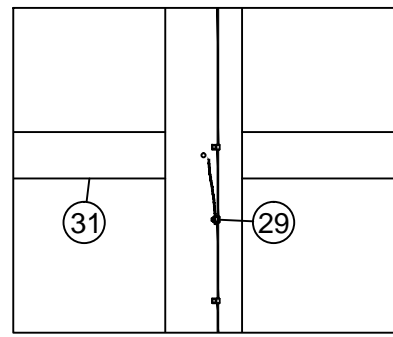
Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.				Drawing Scale: N/A	
	TRANSMISSION CONSTRUCTION STANDARDS MANUAL		STRUCTURE STANDARDS - LAMINATED WOOD 230KV H-FRAME SINGLE CIRCUIT H-FRAME RUNNING ANGLE - 20° TO 30° SINGLE STEEL CROSSARM		REVISION 00
	Drwn. By: B. Franklin Date Dr.: 2/14/2013		Checked By: Becken/Hart	Date Ck.: 3/18/2015	Approved By: Barry R. Hart Date App.: 5/20/2015
TM2.23.TN-2JA9B-X					Sheet 1



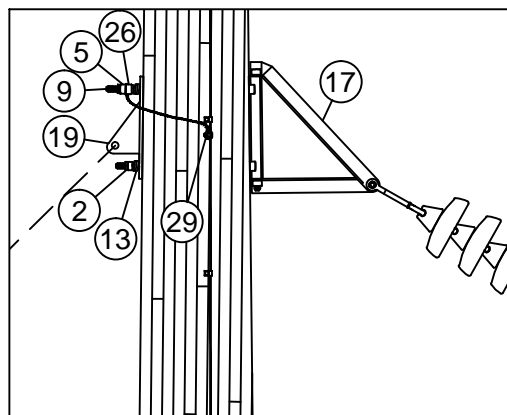
Detail 'A'



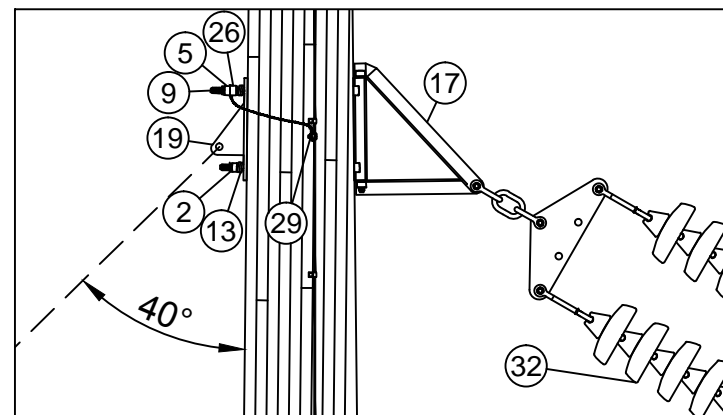
Section A-A



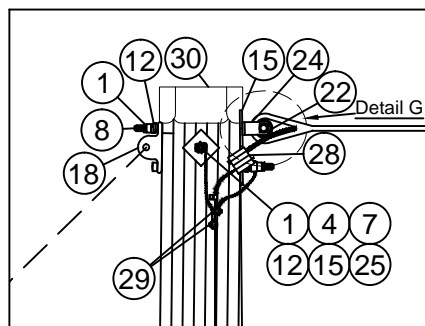
Section B-B



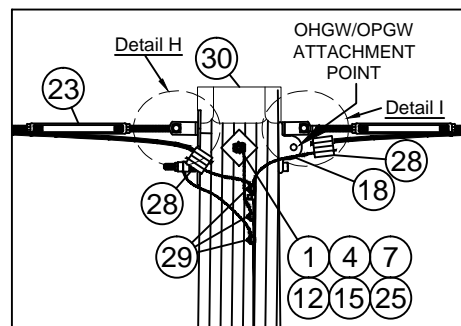
Detail 'C'
SINGLE CONDUCTOR PER PHASE



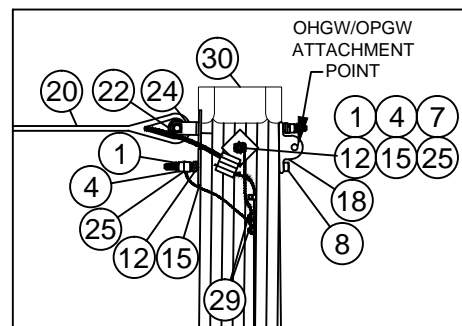
Detail 'C'
TWO CONDUCTOR PER PHASE



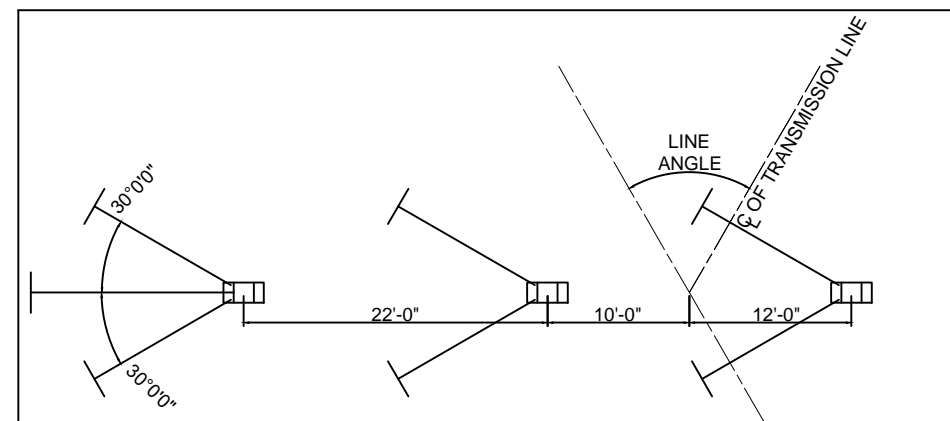
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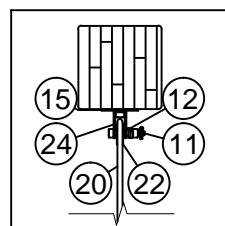
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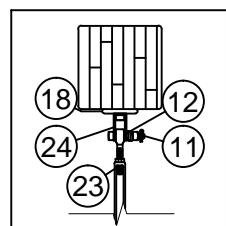
Detail 'F'



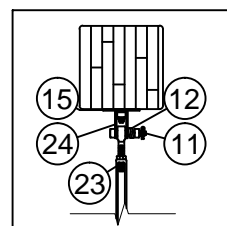
GUYING PLAN



Detail 'G'



Detail 'H'



Detail 'I'

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-TN2JA9B-X2H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-S1A1-X	(2) TP-L-TS-G-H
C*M-TN2JA9B-X2HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S1A1-X	TP-L-TS-G-H TO-L-TS-G-O
C*M-TN2JA9B-X2HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S1A1-X	TP-L-TS-G-H TO-L-TS-G-S
C*M-TN2JA9B-K2H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S1A1-K	(2) TP-L-TS-G-H
C*M-TN2JA9B-K2HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S1A1-K	TP-L-TS-G-H TO-L-TS-G-O
C*M-TN2JA9B-K2HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S1A1-K	TP-L-TS-G-H TO-L-TS-G-S
C*M-TN2JA9B-L2H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S1A1-L	(2) TP-L-TS-G-H
C*M-TN2JA9B-L2HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S1A1-L	TP-L-TS-G-H TO-L-TS-G-O
C*M-TN2JA9B-L2HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S1A1-L	TP-L-TS-G-H TO-L-TS-G-S
C*M-TN2KA9B-X2B2	(6) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-S2A2D1-X	(2) TP-L-TS-G-H
C*M-TN2KA9B-X2BO	(6) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2D1-X	TP-L-TS-G-H TO-L-TS-G-O
C*M-TN2KA9B-X2BS	(6) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2D1-X	TP-L-TS-G-H TO-L-TS-G-S
C*M-TN2KA9B-K2B2	(6) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S2A2D1-K	(2) TP-L-TS-G-H
C*M-TN2KA9B-K2BO	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2D1-K	TP-L-TS-G-H TO-L-TS-G-O
C*M-TN2KA9B-K2BS	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2D1-K	TP-L-TS-G-H TO-L-TS-G-S
C*M-TN2KA9B-L2B2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2D1-L	(2) TP-L-TS-G-H
C*M-TN2KA9B-L2BO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S2A2D1-L	TP-L-TS-G-H TO-L-TS-G-O
C*M-TN2KA9B-L2BS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S2A2D1-L	TP-L-TS-G-H TO-L-TS-G-S

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

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.



TRANSMISSION
CONSTRUCTION
STANDARDS
MANUAL

STRUCTURE STANDARDS - LAMINATED WOOD
230KV H-FRAME SINGLE CIRCUIT
H-FRAME RUNNING ANGLE - 20° TO 30° SINGLE STEEL CROSSARM

REVISION
00
DATE
5/21/2015

Drwn. By: B. Franklin
Date Dr.: 2/14/2013

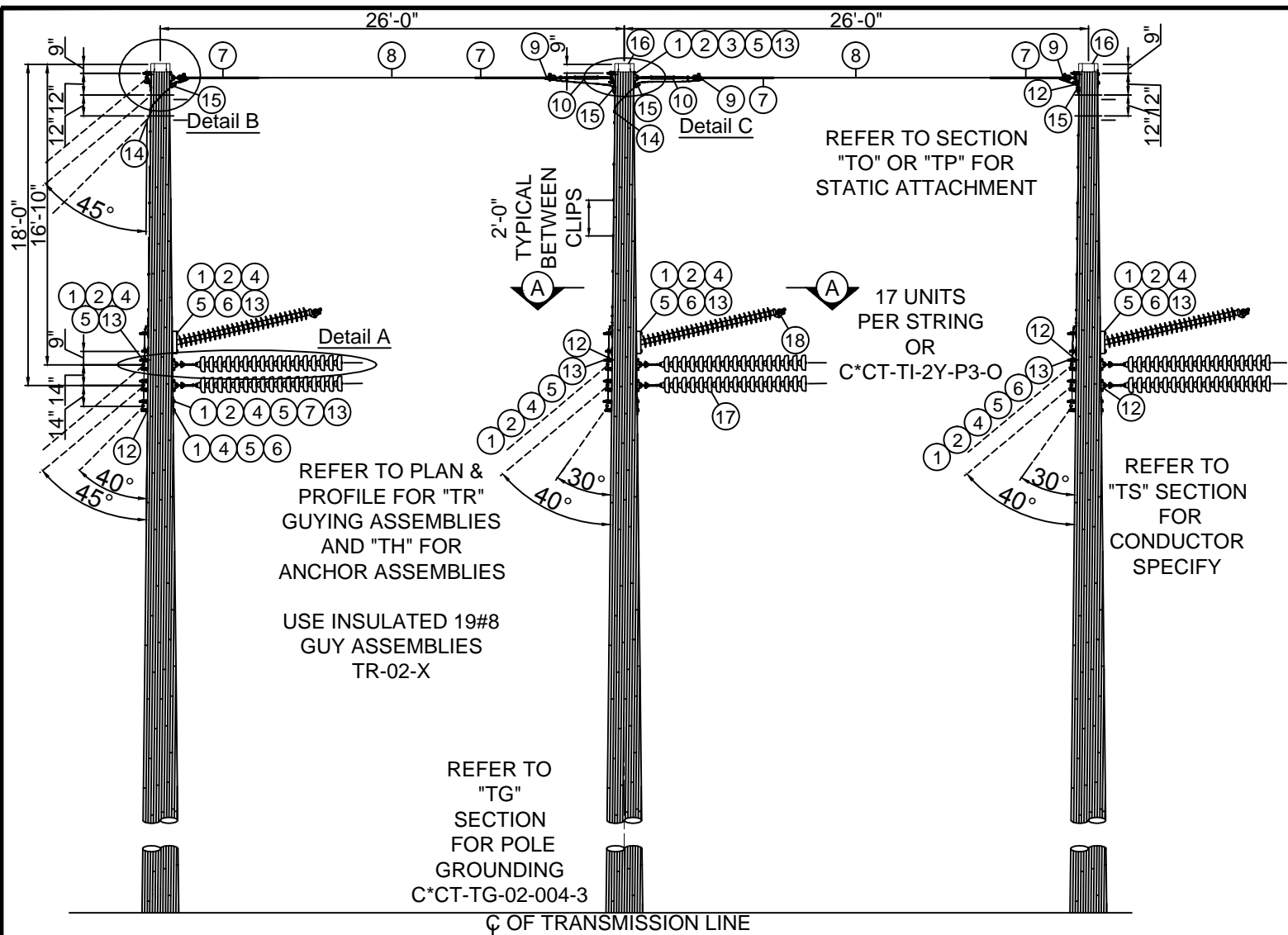
Checked By: Becken/Hart

Date Ck.: 3/18/2015

Approved By: Barry R. Hart
Date App.: 5/20/2015

TM2.23.TN-2JA9B-X

Sheet 2



BILL OF MATERIAL (Type of CU: POLE)					
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-2JDJL	
1	30	EA	1000910800	NUT LCK MF SQ 7/8 BOLT GALV	
2	15	EA	6000273770	NUT SQ 7/8" BOLT GALV	
3	16	EA	1035475016	BOLT SQ HD 7/8 X 16 W/SN (NOTE H)	
4	24	EA	1035475020	BOLT SQ HD 7/8 X 20 W/SN (NOTE H)	
5	30	EA	6000274612	WASHER HELICAL (7/8")	
6	18	EA	1000946500	WASHER 4" SQ FLAT (7/8")	
7	4	EA	1005259000	GRIP PRFRMD GUY 19#8 AWLD	
8	55	FT	6000252362	WIRE ALWD GUY 19#8	
9	4	EA	1010145562	THMBL ROLLER 3-1/4" DIA 1-1/16" H	
10	2	EA	6000274527	TURNBUCKLE, 7/8 X 27 (+/- 6 IN), JAW-ROD, 30K	
11	8	EA	1039220531	SHCKL ANCH 7/8 BNK 1-1/4 OPNG	
12	20	EA	6000274505	DEAD END TEE, 60K	
13	15	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H	
14	2	EA	1036232100	CONN 1B W/SPCR	
15	4	EA	6000113887	CONN COMP #2 SOL - 19#8 AWLD	
16	3	EA	6000820052	POLE TOPPER 19"	

BILL OF MATERIAL (Type of CU: INSO) - SINGLE CONDUCTOR PER PHASE					
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-17	
17	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (17 UNITS/STRING)	
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-O	
17	6	EA	6000312023	INS POLY Y-BALL 30K 17 UNIT EQ. W/COR RING	
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-HF	
18	3	EA	6000310283	INS LINE POST 230KV W/ CLAMP FITTING & FLAT BASE	

ADDITIONAL BILL OF MATERIAL (Type of CU: INSO) - TWO CONDUCTORS PER PHASE					
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-17	
17	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (17 UNITS/STRING)	
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-O	
17	6	EA	6000312023	INS POLY Y-BALL 30K 17 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
- TH GUYING ASSEMBLIES
- TK MARKINGS
- TR GUY ANCHORS

NOTE B: POLE DRILLING: ALL HOLES - 15/16" DIAMETER

NOTE C: IF CONDUCTOR NESC HEAVY LOADING TENSION IS LESS THAN 10,000#, USE STRAIN CLAMPS; IF NESC TENSION IS 10,000# OR GREATER, USE COMPRESSION DEAD END ASSEMBLIES.

NOTE D: FOR LINE ANGLES LESS THAN 20° DEAD END ASSEMBLIES SHALL BE INSTALLED BACK TOBACK AND SUBSEQUENTLY THE CORRESPONDING IN-LINE GUYS SHALL BE INSTALLED BACK TO BACK.

NOTE E: FOR SHALLOW ANGLES, THE STATIC WIRE IN-LINE GUYS MAY BE SHIFTED OUT OF DIRECT LINE IN ORDER TO MAINTAIN PROPER CLEARANCE TO THE PHASE CONDUCTORS.

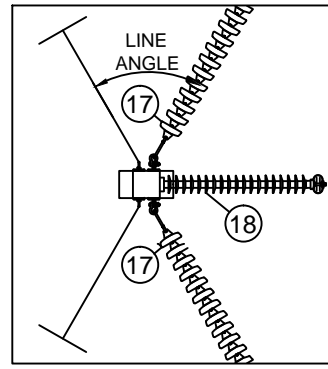
NOTE F: IF POLE SPACING IS DIFFERENT IT SHALL BE NOTED ON THE PLAN AND PROFILE DRAWINGS.

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.

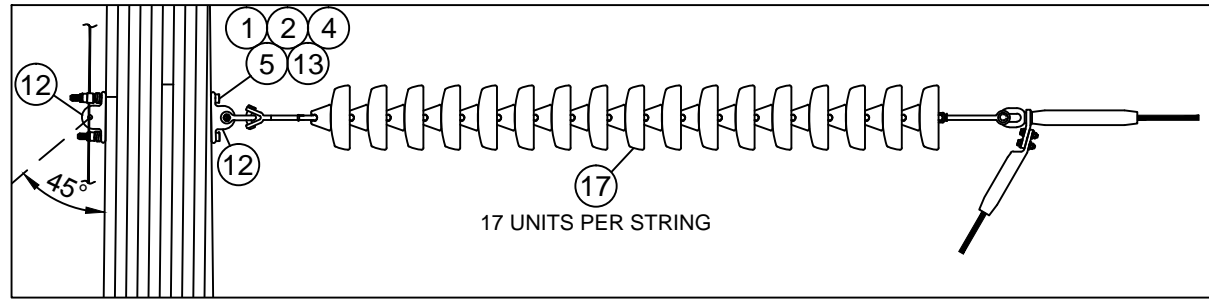
NOTE H: LARGER OR SMALLER BOLTS MAY BE REQUIRED DEPENDING ON THE DIAMETER OF THE POLE USED. SUBSTITUTE MATERIAL ID (MID) ON THE WORK ORDER COMPONENTS PAGE FOR THE LENGTH NEEDED IF DIFFERENT THAN THE GENERIC LENGTH SHOWN IN THE BILL OF MATERIALS. CONTACT SYSTEM ENGINEERING - TRANSMISSION SECTION IF YOU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

NOTE I: USE A STEEL DEADEND STRUCTURE WHEN USING BUNDLED CONDUCTOR CONFIGURATION.

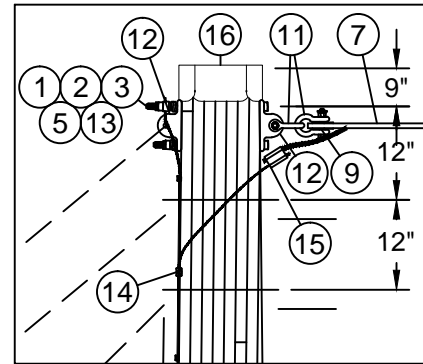
THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY					
Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.				Drawing Scale: N/A	
	TRANSMISSION CONSTRUCTION STANDARDS MANUAL		STRUCTURE STANDARDS - LAMINATED WOOD 230KV H-FRAME SINGLE CIRCUIT ANGLE DEAD END 60° AND LESS		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-2JDJL-X					Sheet 1



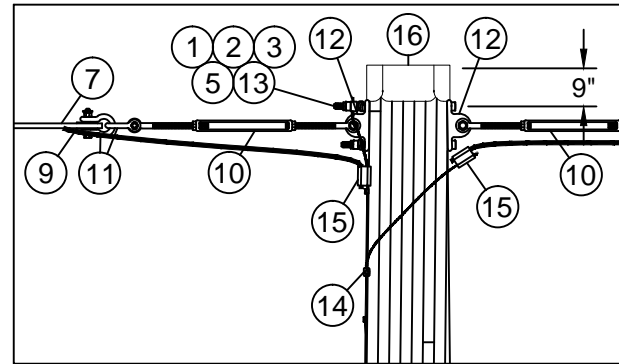
VIEW A-A



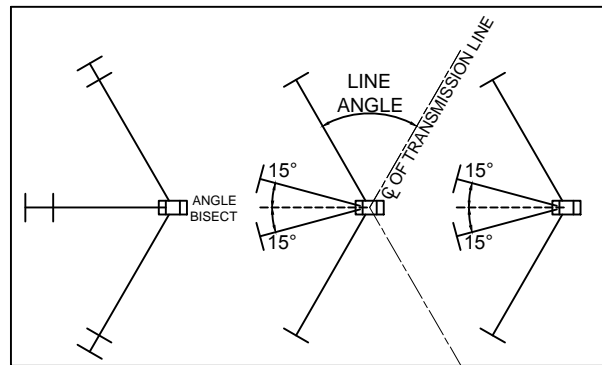
Detail 'A'
(ASSEMBLY FOR COMPRESSION CLAMP SINGLE CONDUCTOR PER PHASE SHOWN)



Detail 'B'



Detail 'C'



GUYING PLAN

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

BILL OF MATERIAL WITH STRAIN CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2JDJLF-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-X	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2JDJLF-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-X	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2JDJLF-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-X	TP-W-AU-G-H TO-W-AD-G-S
C*M-TN2JDJLF-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-K	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2JDJLF-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-K	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2JDJLF-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-K	TP-W-AU-G-H TO-W-AD-G-S
C*M-TN2JDJLF-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-L	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2JDJLF-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-L	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2JDJLF-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-L	TP-W-AU-G-H TO-W-AD-G-S

BILL OF MATERIAL WITH COMPRESSION DEADEND CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2JDJLG-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-C2P1-X	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2JDJLG-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-X	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2JDJLG-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-X	TP-W-AU-G-H TO-W-AD-G-S
C*M-TN2JDJLG-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-C2P1-K	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2JDJLG-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-K	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2JDJLG-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-K	TP-W-AU-G-H TO-W-AD-G-S
C*M-TN2JDJLG-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-C2P1-L	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2JDJLG-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-L	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2JDJLG-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-L	TP-W-AU-G-H TO-W-AD-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*_)

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

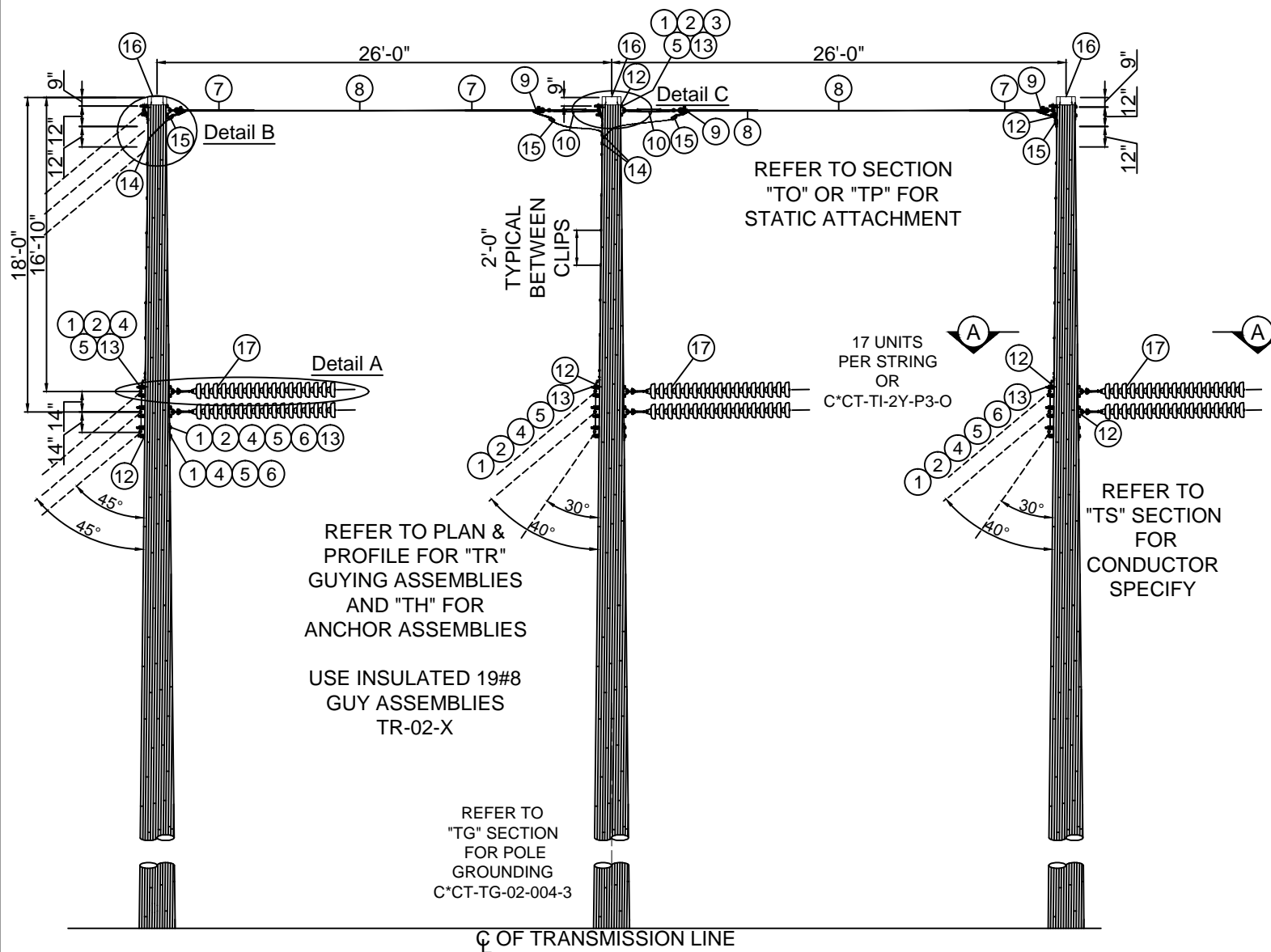
STRUCTURE STANDARDS - LAMINATED WOOD
230KV H-FRAME SINGLE CIRCUIT
ANGLE DEAD END 60° AND LESS

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-2JDJL-X

Sheet 2



BILL OF MATERIAL (Type of CU: POLE)					
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-2JDOB	
1	24	EA	1000910800	NUT LCK MF SQ 7/8 BOLT GALV	
2	12	EA	6000273770	NUT SQ 7/8" BOLT GALV	
3	6	EA	1035475016	BOLT SQ HEAD 7/8 X 16 W/ SQ NUT (NOTE G)	
4	18	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE G)	
5	24	EA	6000274612	WASHER HELICAL (7/8")	
6	12	EA	1000946500	WASHER 4" SQ FLAT (7/8")	
7	4	EA	1005259000	GRIP PRFRMD GUY 19#8 AWLD	
8	55	FT	6000252362	WIRE ALWD GUY 19#8	
9	4	EA	1010145562	THMBL ROLLER 3-1/4" DIA 1-1/16" H	
10	2	EA	6000274527	TURNBUCKLE, 7/8 X 27 (+/- 6 IN), JAW-ROD, 30K	
11	8	EA	1039220531	SHCKL ANCH 7/8 BNK 1-1/4 OPNG	
12	20	EA	6000274505	DEAD END TEE, 60K	
13	12	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H	
14	3	EA	1036232100	CONN 1B W/SPCR	
15	4	EA	6000113887	CONN COMP #2 SOL - 19#8 AWLD	
16	3	EA	6000820052	POLE TOPPER 19"	

BILL OF MATERIAL (Type of CU: INSO) - SINGLE CONDUCTOR PER PHASE					
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-17	
17	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (17 UNITS/STRING)	
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-O	
17	6	EA	6000312023	INS POLY Y-BALL 30K 17 UNIT EQ. W/COR RING	

ADDITIONAL BILL OF MATERIAL (Type of CU: INSO) - TWO CONDUCTORS PER PHASE					
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-17	
17	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (17 UNITS/STRING)	
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-O	
17	6	EA	6000312023	INS POLY Y-BALL 30K 17 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
 TH GUYING ASSEMBLIES
 TK MARKINGS
 TR GUY ANCHORS

NOTE B: POLE DRILLING: ALL HOLES - 15/16" DIAMETER

NOTE C: IF CONDUCTOR NESC HEAVY LOADING TENSION IS LESS THAN 10,000#, USE STRAIN CLAMPS; IF NESC TENSION IS 10,000# OR GREATER, USE COMPRESSION DEAD END ASSEMBLIES.

NOTE D: FOR LINE ANGLES LESS THAN 20° DEAD END ASSEMBLIES SHALL BE INSTALLED BACK TO BACK AND SUBSEQUENTLY THE CORRESPONDING IN-LINE GUYS SHALL BE INSTALLED BACK TO BACK.

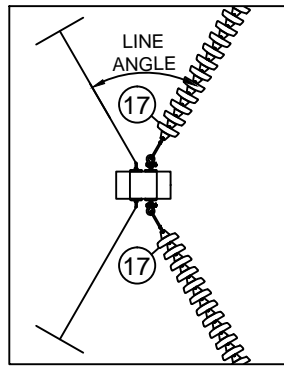
NOTE E: IF POLE SPACING IS DIFFERENT IT SHALL BE NOTED ON THE PLAN AND PROFILE DRAWINGS.

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.

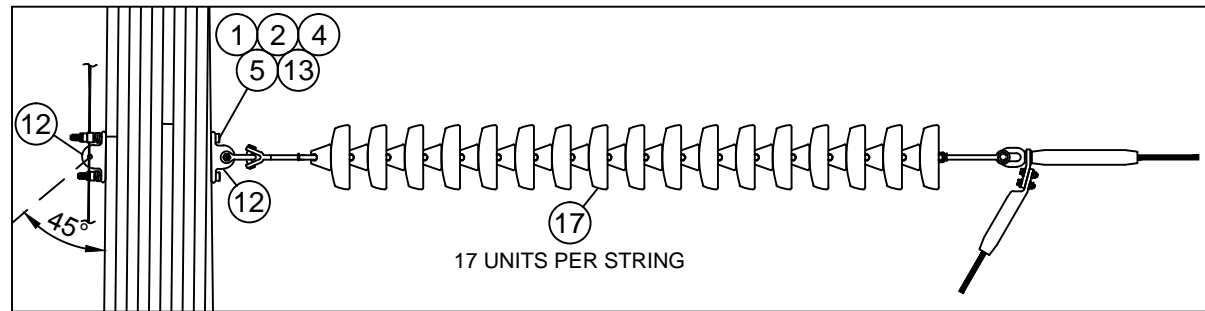
NOTE G: LARGER OR SMALLER BOLTS MAY BE REQUIRED DEPENDING ON THE DIAMETER OF THE POLE USED. SUBSTITUTE MATERIAL ID (MID) ON THE WORK ORDER COMPONENTS PAGE FOR THE LENGTH NEEDED IF DIFFERENT THAN THE GENERIC LENGTH SHOWN IN THE BILL OF MATERIALS. CONTACT SYSTEM ENGINEERING - TRANSMISSION SECTION IF YOU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

NOTE H: USE A STEEL DEADEND STRUCTURE WHEN USING BUNDLED CONDUCTOR CONFIGURATION.

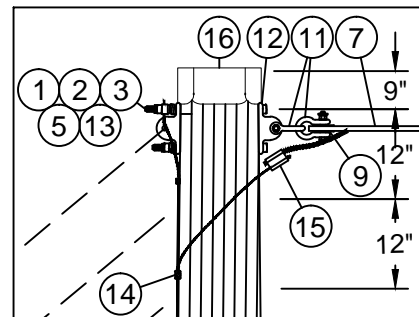
THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY					
Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.				Drawing Scale: N/A	
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					DATE 5/21/2015
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
B. Franklin	2/15/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015
TM2.23.TN-2JDOB-X					Sheet 1



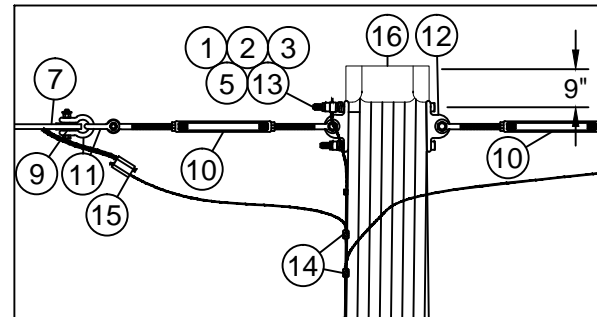
VIEW A-A



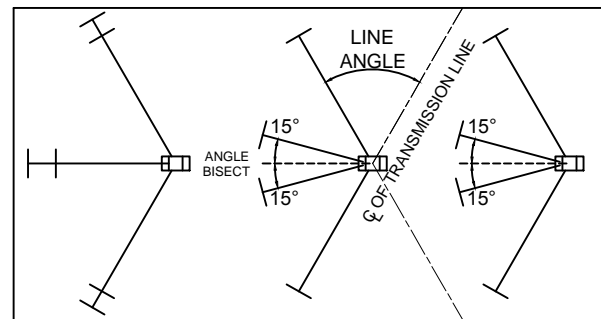
Detail 'A'
(ASSEMBLY FOR COMPRESSION CLAMP SINGLE CONDUCTOR PER PHASE SHOWN)



Detail 'B'



Detail 'C'



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

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

BILL OF MATERIAL WITH STRAIN CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2JDOBC-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-X	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2JDOBC-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-X	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2JDOBC-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-X	TP-W-AU-G-H TO-W-AD-G-S
C*M-TN2JDOBC-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-K	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2JDOBC-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-K	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2JDOBC-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-K	TP-W-AU-G-H TO-W-AD-G-S
C*M-TN2JDOBC-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-L	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2JDOBC-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-L	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2JDOBC-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-L	TP-W-AU-G-H TO-W-AD-G-S

BILL OF MATERIAL WITH COMPRESSION DEADEND CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2JDOBD-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-C2P1-X	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2JDOBD-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-X	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2JDOBD-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-X	TP-W-AU-G-H TO-W-AD-G-S
C*M-TN2JDOBD-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-C2P1-K	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2JDOBD-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-K	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2JDOBD-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-K	TP-W-AU-G-H TO-W-AD-G-S
C*M-TN2JDOBD-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-C2P1-L	TP-W-AU-G-H TP-W-AD-G-H
C*M-TN2JDOBD-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-L	TP-W-AU-G-H TO-W-AD-G-O
C*M-TN2JDOBD-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-L	TP-W-AU-G-H TO-W-AD-G-S

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

Drawing Scale: N/A



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STANDARDS
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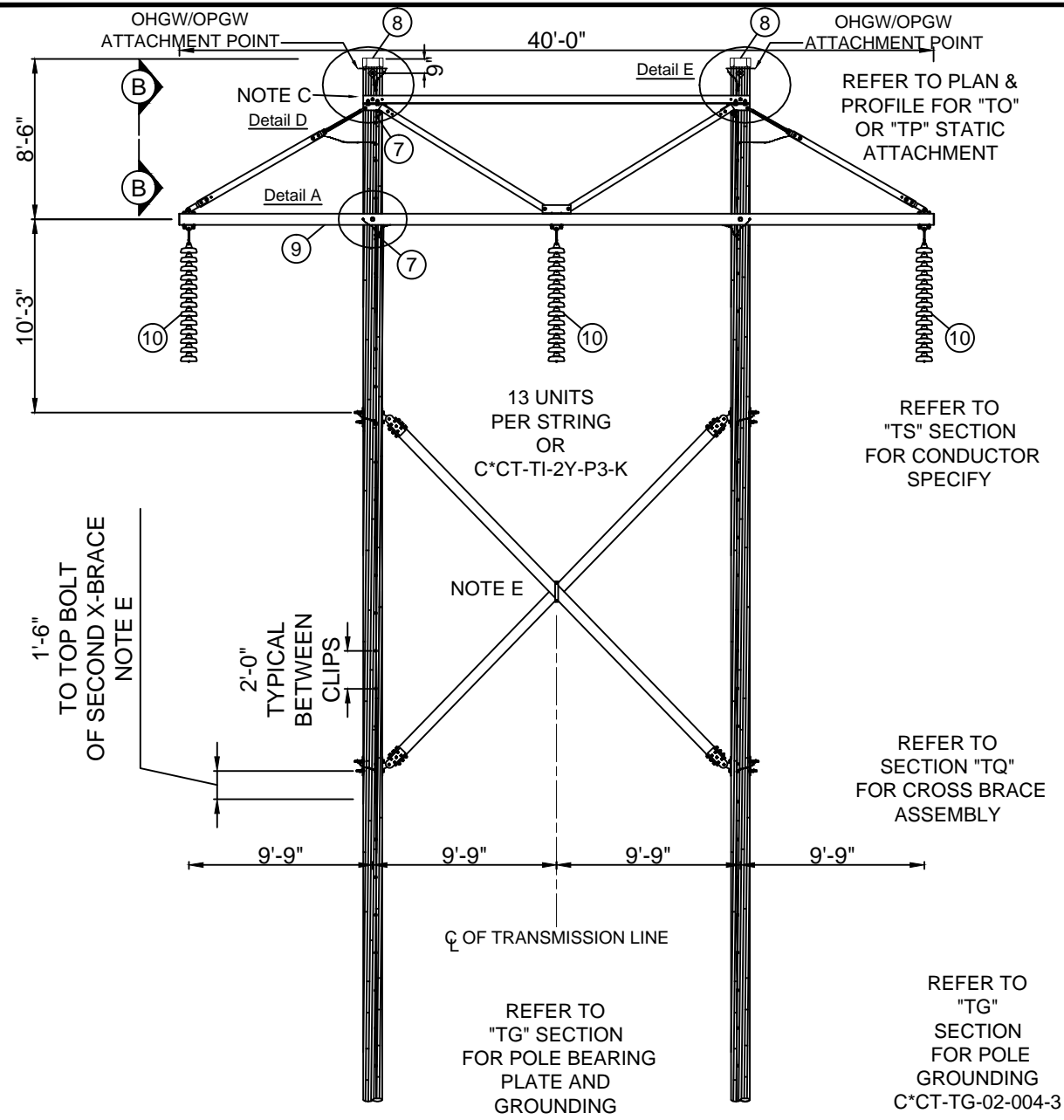
STRUCTURE STANDARDS - LAMINATED WOOD
230KV H-FRAME SINGLE CIRCUIT
ANGLE DEAD END 60° AND GREATER

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-2JDOB-X

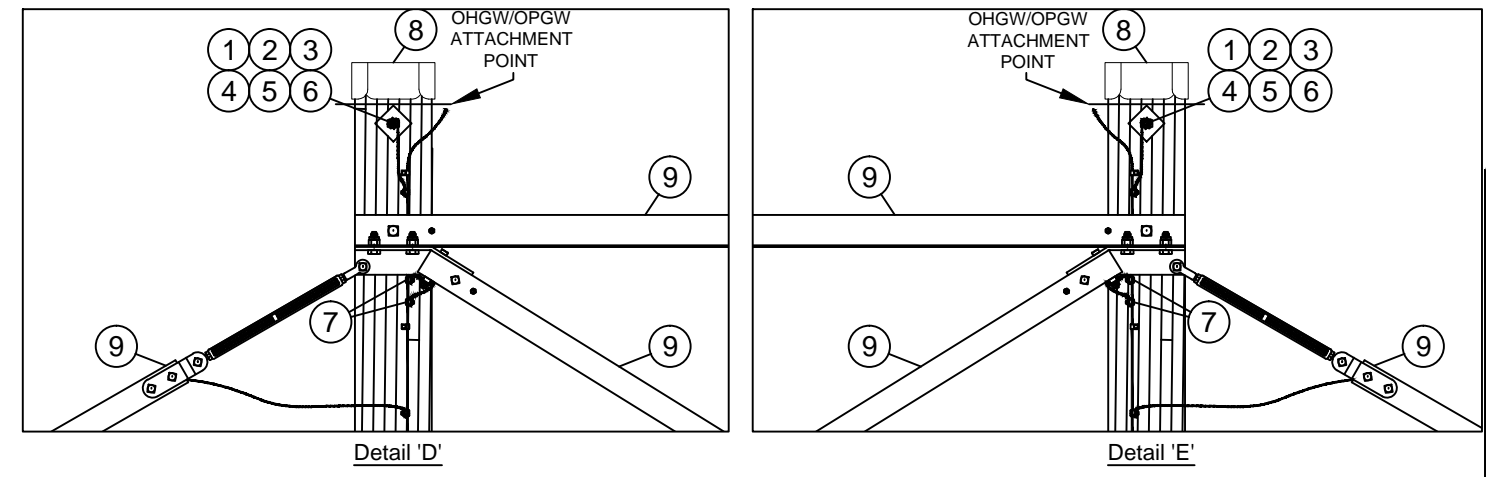
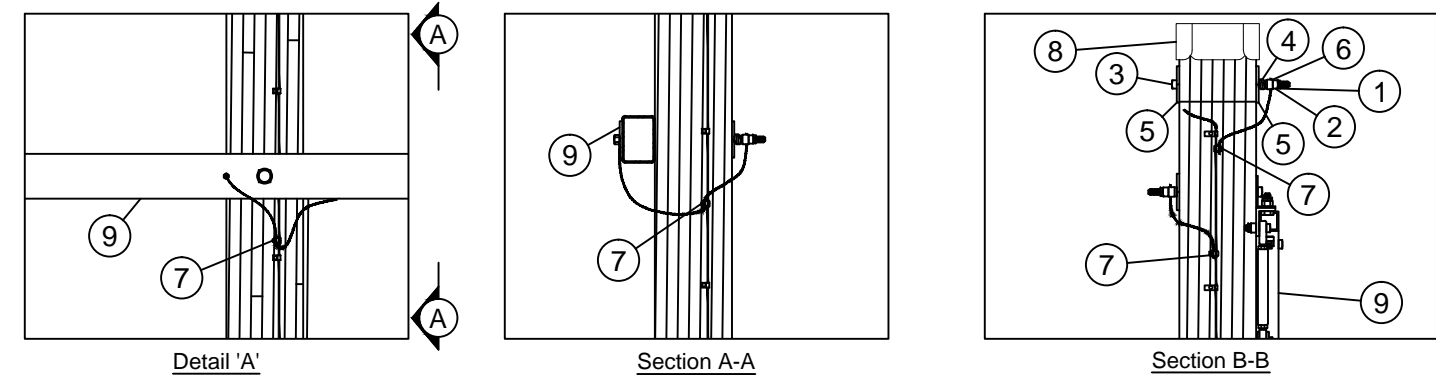
Sheet 2



BILL OF MATERIAL (Type of CU: POLE)				
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-2JHTB
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 D)
4	2	EA	6000274612	WASHER HELICAL (7/8")
5	4	EA	1000946500	WASHER 4" SQ FLAT (7/8")
6	2	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
7	15	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-2S-A-FC40
9	1 CU	EA	1036235440	SINGLE CROSSARM, STEEL, 7" X 7" X 40'-0"

BILL OF MATERIAL (Type of CU: INSO)				
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-13
10	3 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (13 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-K
10	3	EA	6000312031	INS POLY Y-BALL 30K 13 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
 XARM 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: 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: STRUCTURES USING 80' LONG POLES OR LONGER REQUIRE (2) CROSS BRACES, REFER TO SECTION TQ FOR ADDITIONAL CROSS BRACE ASSEMBLY.

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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			REVISION
		230KV H-FRAME SINGLE CIRCUIT TANGENT SUSPENSION STRUCTURE - SINGLE STEEL ARM			00
Drwn. By: B. Franklin	Date Dr.: 5/22/2013	Checked By: Becken/Hart	Date Ck.: 3/18/2015	Approved By: Barry R. Hart	Date App.: 5/20/2015
TM2.23.TN-2JHTB-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-TN2JHTB-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-S1A1-X	(2) TP-W-TS-G-H
C*M-TN2JHTB-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD	TS-S1A1-X	TP-W-TS-G-H
		(1) - 36 FIBER OPGW		TO-W-TS-G-O
C*M-TN2JHTB-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD	TS-S1A1-X	TP-W-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-TS-G-S
C*M-TN2JHTB-K-H2	(3) - 1192 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S1A1-K	(2) TP-W-TS-G-H
C*M-TN2JHTB-K-HO	(3) - 1192 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S1A1-K	TP-W-TS-G-H
		(1) - 36 FIBER OPGW		TO-W-TS-G-O
C*M-TN2JHTB-K-HS	(3) - 1192 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S1A1-K	TP-W-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-TS-G-S
C*M-TN2JHTB-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S1A1-L	(2) TP-W-TS-G-H
C*M-TN2JHTB-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S1A1-L	TP-W-TS-G-H
		(1) - 36 FIBER OPGW		TO-W-TS-G-O
C*M-TN2JHTB-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S1A1-L	TP-W-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-TS-G-S
C*M-TN2KHTB-X2H2	(6) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-S2A2Y1-X	(2) TP-W-TS-G-H
C*M-TN2KHTB-X2HO	(6) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD	TS-S2A2Y1-X	TP-W-TS-G-H
		(1) - 36 FIBER OPGW		TO-W-TS-G-O
C*M-TN2KHTB-X2HS	(6) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD	TS-S2A2Y1-X	TP-W-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-TS-G-S
C*M-TN2KHTB-K2H2	(6) - 1192 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2Y1-K	(2) TP-W-TS-G-H
C*M-TN2KHTB-K2HO	(6) - 1192 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2Y1-K	TP-W-TS-G-H
		(1) - 36 FIBER OPGW		TO-W-TS-G-O
C*M-TN2KHTB-K2HS	(6) - 1192 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2Y1-K	TP-W-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-W-TS-G-S
C*M-TN2KHTB-L2H2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2Y1-L	(2) TP-W-TS-G-H
C*M-TN2KHTB-L2HO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2Y1-L	TP-W-TS-G-H
		(1) - 36 FIBER OPGW		TO-W-TS-G-O
C*M-TN2KHTB-L2HS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S2A2Y1-L	TP-W-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		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*_).

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

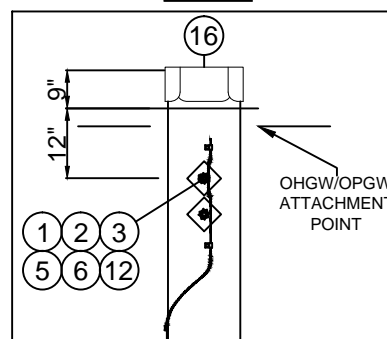
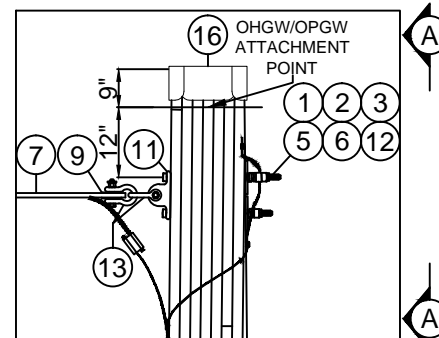
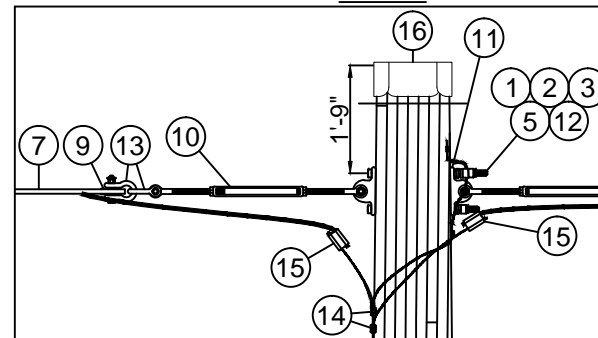
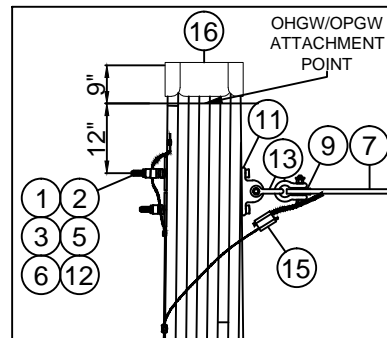
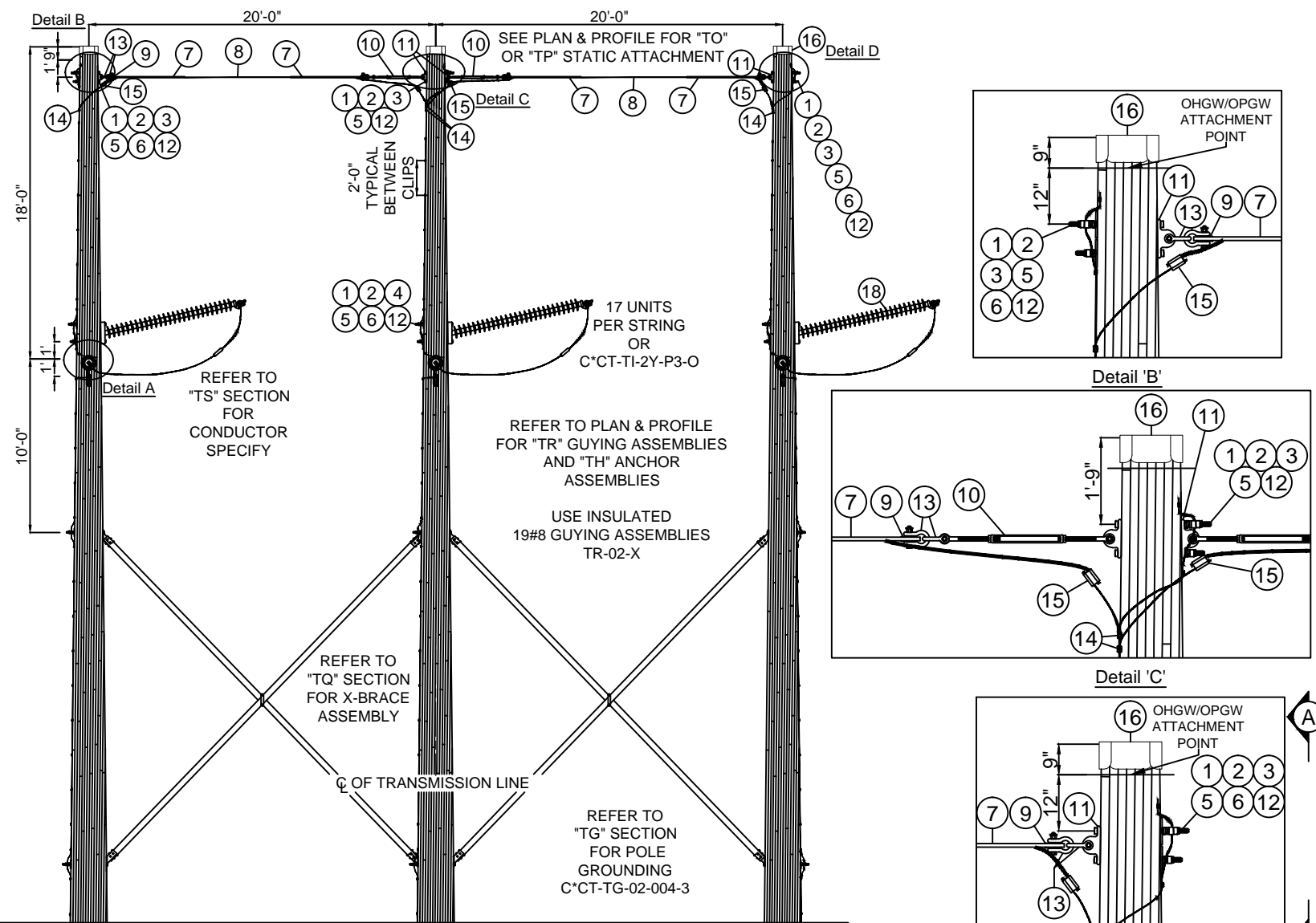
STRUCTURE STANDARDS - LAMINATED WOOD
230kV H-FRAME SINGLE CIRCUIT
TANGENT SUSPENSION STRUCTURE - SINGLE STEEL ARM

REVISION
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DATE
5/21/2015

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
B. Franklin	5/22/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015

TM2.23.TN-2JHTB-X

Sheet 2



BILL OF MATERIAL (CU Type: POLE)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-2JHYL
1	24	EA	1000910800	NUT LCK MF SQ 7/8 BOLT GALV
2	12	EA	6000273770	NUT SQ 7/8 BOLT GALV
3	6	EA	1035475016	BOLT SQ HEAD 7/8 X 16 W/ SQ NUT (NOTE F)
4	18	EA	1035475022	BOLT SQ HEAD 7/8 X 22 W/ SQ NUT (NOTE F)
5	24	EA	6000274612	WASHER HELICAL (7/8")
6	10	EA	1000946500	WASHER 4" SQ FLAT (7/8")
7	4	EA	1005259000	GRIP PRFRMD GUY 19#8 AWLD
8	50	EA	6000252362	WIRE ALWD GUY 19#8
9	4	EA	1010145562	THMBL ROLLER 3-1/4" DIA 1-1/16" H
10	2	EA	6000274527	TURNBUCKLE, 7/8 X 27 (+/- 6 IN), JAW-ROD, 30K
11	16	EA	6000274505	DEAD END TEE, 60K
12	12	EA	1036200007	CLMP GRD WIRE U-CLIP 15/16" H
13	8	EA	1039220531	SHCKL ANCH 7/8 BNK 1-1/4 OPNG
14	4	EA	1036232100	CONN 1B W/SPCR
15	4	EA	6000113887	CONN COMP #2 SOL - 19#8 AWLD
16	3	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (CU Type: INSO) - SINGLE CONDUCTOR PER PHASE

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-17
17	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (17 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-O
17	6	EA	6000312023	INS POLY Y-BALL 30K 17 UNIT EQ. W/COR RING
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-HF
18	3	EA	6000310283	INS LINE POST 230KV W/ CLAMP FITTING & FLAT BASE

ADDITIONAL BILL OF MATERIAL (CU Type: INSO) - TWO CONDUCTORS PER PHASE

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-17
17	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (17 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-O
17	6	EA	6000312023	INS POLY Y-BALL 30K 17 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
 - TH GUYING ASSEMBLIES
 - TK MARKINGS
 - TR GUY ANCHORS

NOTE B: POLE DRILLING: ALL HOLES - 15/16" DIAMETER

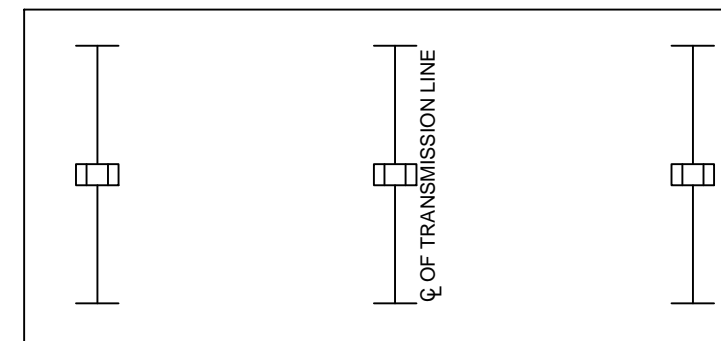
NOTE C: IF CONDUCTOR NESC HEAVY LOADING TENSION IS LESS THAN 10,000#, USE STRAIN CLAMPS; IF NESC TENSION IS 10,000# OR GREATER, USE COMPRESSION DEAD END ASSEMBLIES.

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

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.

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 SYSTEM ENGINEERING - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

NOTE G: USE A STEEL DEADEND STRUCTURE WHEN USING BUNDLED CONDUCTOR CONFIGURATION.



GUYING PLAN

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			REVISION
		230KV H-FRAME SINGLE CIRCUIT TANGENT DEADEND STRUCTURE			00
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-2JHYL-X					Sheet 1

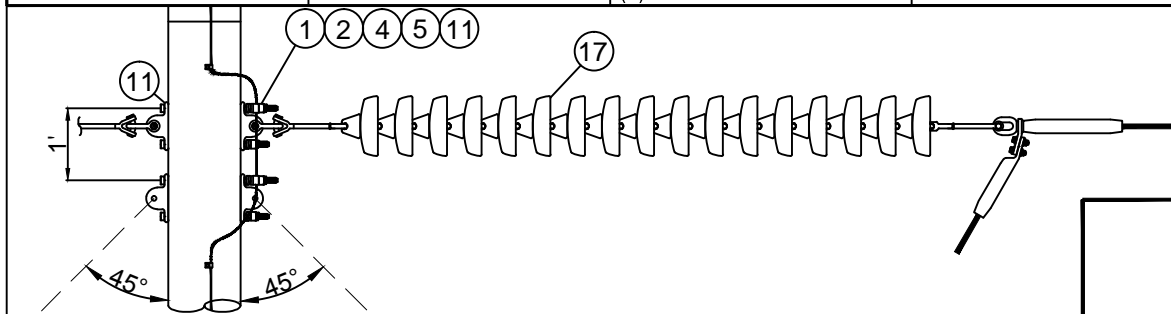
USE THE MACRO CUs INSTEAD OF INDIVIDUAL CU COMPONENTS FOR EASE OF WORK ORDER ENTRY.

BILL OF MATERIAL WITH STRAIN CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2JHYLF-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-X	(2) TP-W-DE-G-H
C*M-TN2JHYLF-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-X	TP-W-DE-G-H TO-W-DE-G-O
C*M-TN2JHYLF-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-X	TP-W-DE-G-H TO-W-DE-G-S
C*M-TN2JHYLF-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-K	(2) TP-W-DE-G-H
C*M-TN2JHYLF-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-K	TP-W-DE-G-H TO-W-DE-G-O
C*M-TN2JHYLF-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-K	TP-W-DE-G-H TO-W-DE-G-S
C*M-TN2JHYLF-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-L	(2) TP-W-DE-G-H
C*M-TN2JHYLF-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-L	TP-W-DE-G-H TO-W-DE-G-O
C*M-TN2JHYLF-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-L	TP-W-DE-G-H TO-W-DE-G-S

BILL OF MATERIAL WITH COMPRESSION DEADEND CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2JHYLG-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-C2P1-X	(2) TP-W-DE-G-H
C*M-TN2JHYLG-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-X	TP-W-DE-G-H TO-W-DE-G-O
C*M-TN2JHYLG-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-X	TP-W-DE-G-H TO-W-DE-G-S
C*M-TN2JHYLG-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-C2P1-K	(2) TP-W-DE-G-H
C*M-TN2JHYLG-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-K	TP-W-DE-G-H TO-W-DE-G-O
C*M-TN2JHYLG-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-K	TP-W-DE-G-H TO-W-DE-G-S
C*M-TN2JHYLG-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-C2P1-L	(2) TP-W-DE-G-H
C*M-TN2JHYLG-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-L	TP-W-DE-G-H TO-W-DE-G-O
C*M-TN2JHYLG-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-L	TP-W-DE-G-H TO-W-DE-G-S



Detail 'A'

(ASSEMBLY FOR COMPRESSION CLAMP SINGLE CONDUCTOR PER PHASE SHOWN)

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

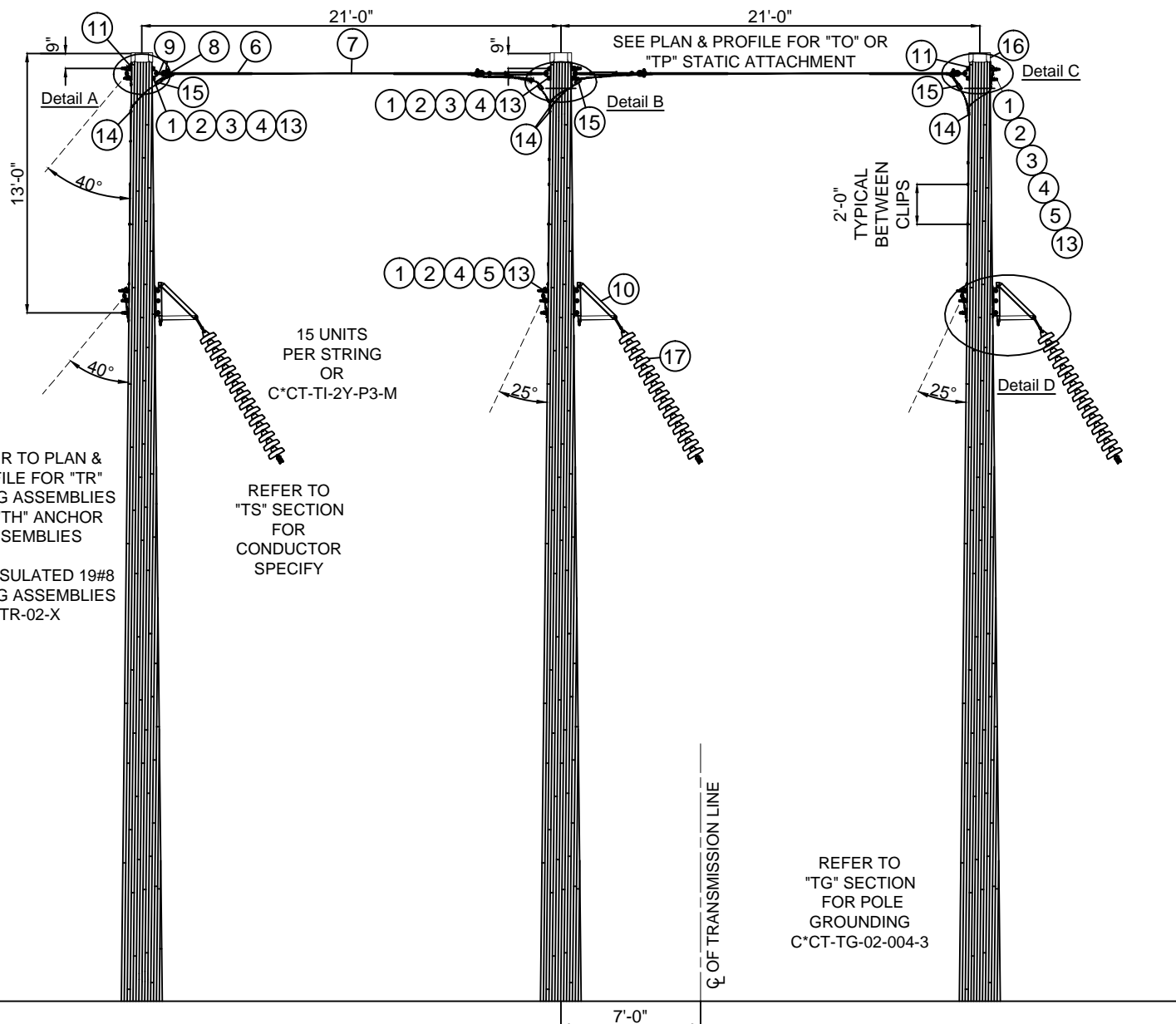
STRUCTURE STANDARDS - LAMINATED WOOD
230kV H-FRAME SINGLE CIRCUIT
TANGENT DEADEND STRUCTURE

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-2JHYL-X

Sheet 2



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

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

REFER TO "TS" SECTION FOR CONDUCTOR SPECIFY

15 UNITS PER STRING OR C*CT-TI-2Y-P3-M

REFER TO "TG" SECTION FOR POLE GROUNDING C*CT-TG-02-004-3

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
 - TH GUYING ASSEMBLIES
 - TK MARKINGS
 - TR GUY ANCHORS

NOTE B: POLE DRILLING: ALL HOLES - 15/16" DIAMETER

NOTE C: 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 D: REFER TO SECTION "TS" FOR CONDUCTOR ASSEMBLIES.

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 SYSTEM ENGINEERING - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

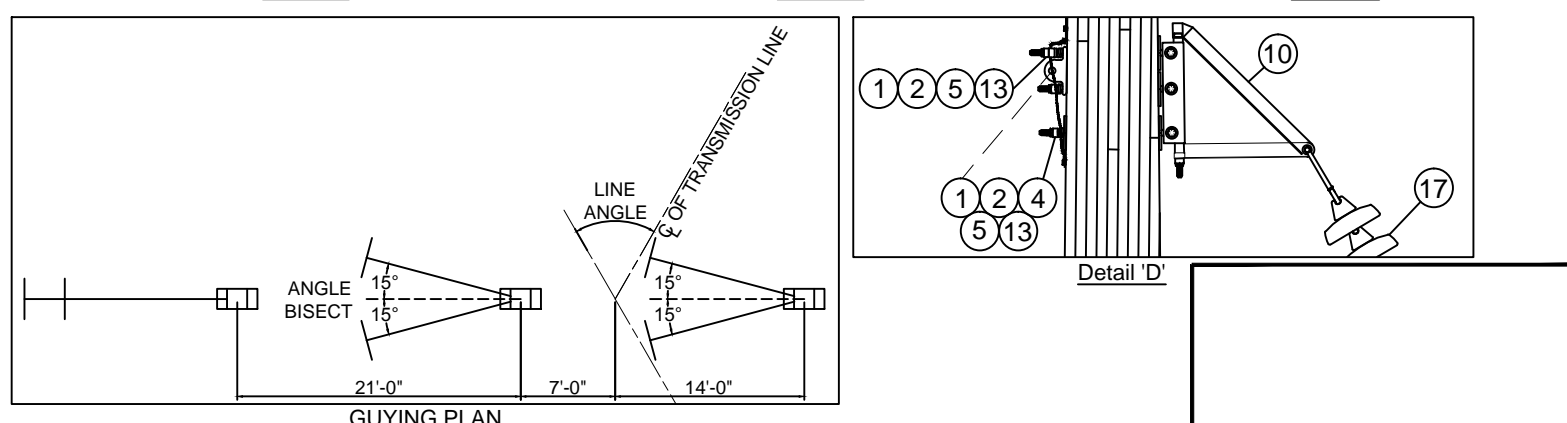
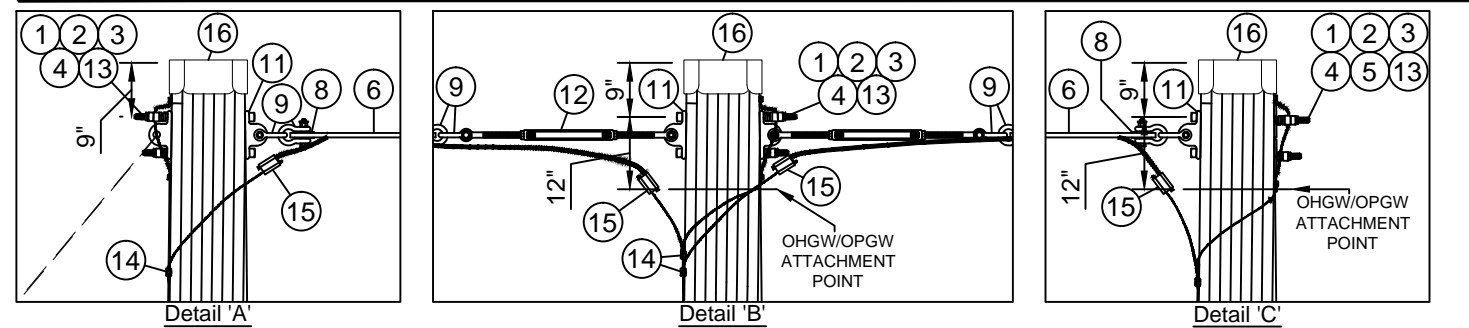
NOTE F: SWINGING ANGLE BRACKET SUPPLIED WITH MOUNTING BOLTS, CHANNEL, DEAD END TEE AND GAIN. DO NOT USE GAIN FOR LAMINATED POLES.

NOTE G: IF POLE SPACING IS ANYTHING OTHER THAN 21' IT SHALL BE NOTED ON THE PLAN AND PROFILE DRAWING.

BILL OF MATERIAL (CU Type: POLE)					
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-2JSBB	
1	15	EA	1000910800	NUT LCK MF SQ 7/8 BOLT GALV	
2	6	EA	6000273770	NUT SQ 7/8 BOLT GALV	
3	6	EA	1035475016	BOLT SQ HEAD 7/8 X 16 W/ SQ NUT (NOTE E)	
4	15	EA	6000274612	WASHER HELICAL (7/8")	
5	14	EA	1000946500	WASHER 4" SQ FLAT (7/8")	
6	4	EA	1005259000	GRIP PRFRMD GUY 19#8 AWLD	
7	45	EA	6000252362	WIRE ALWD GUY 19#8	
8	4	EA	1010145562	THMBL ROLLER 3-1/4" DIA 1-1/16" H	
9	8	EA	1039220531	SHCKL ANCH 7/8 BNK 1-1/4 OPNG	
10	3	EA	6000250716	SWINGING ANGLE BRACKET (NOTE F)	
11	5	EA	6000274505	DEAD END TEE, 60K	
12	2	EA	6000274527	TURNBUCKLE, 7/8 X 27 (+/- 6 IN), JAW-ROD, 30K	
13	6	EA	1036200007	CLMP GRD WIRE U-CLIP 15/16" H	
14	4	EA	1036232100	CONN 1B W/SPCR	
15	4	EA	6000113887	CONN COMP #2 SOL - 19#8 AWLD	
16	3	EA	6000820052	POLE TOPPER 19"	

BILL OF MATERIAL (CU Type: INSO)					
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-15	
17	3 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (15 UNITS/STRING)	

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-M	
17	3	EA	6000312037	INS POLY Y-BALL 30K 15 UNIT EQ. W/COR RING	



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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 230KV H-FRAME SINGLE CIRCUIT ANGLE SUSPENSION STRUCTURE - SWINGING BRACKETS FOR ANGLES 5° TO 20°	REVISION 00 DATE 5/21/2015
	Drwn. By: B. Franklin Date Dr.: 2/14/2013	Checked By: Becken/Hart	Date Ck.: 3/18/2015
Approved By: Barry R. Hart Date App.: 5/20/2015		TM2.23.TN-2JSBB-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-TN2JSBB-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-S1A1-X	(2) TP-L-TS-G-H
C*M-TN2JSBB-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD	TS-S1A1-X	TP-L-TS-G-H
		(1) - 36 FIBER OPGW		TO-L-TS-G-O
C*M-TN2JSBB-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD	TS-S1A1-X	TP-L-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-L-TS-G-S
C*M-TN2JSBB-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S1A1-K	(2) TP-L-TS-G-H
		(1) - 7#7 (7/16") AWLD		TP-L-TS-G-H
C*M-TN2JSBB-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD	TS-S1A1-K	TP-L-TS-G-H
		(1) - 36 FIBER OPGW		TO-L-TS-G-O
C*M-TN2JSBB-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD	TS-S1A1-K	TP-L-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-L-TS-G-S
C*M-TN2JSBB-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S1A1-L	(2) TP-L-TS-G-H
		(1) - 7#7 (7/16") AWLD		TP-L-TS-G-H
C*M-TN2JSBB-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S1A1-L	TP-L-TS-G-H
		(1) - 36 FIBER OPGW		TO-L-TS-G-O
C*M-TN2JSBB-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD	TS-S1A1-L	TP-L-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-L-TS-G-S
C*M-TN2KSBB-X2H2	(6) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-S2A2Z1-X	(2) TP-L-TS-G-H
		(1) - 7#7 (7/16") AWLD		TP-L-TS-G-H
C*M-TN2KSBB-X2HO	(6) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD	TS-S2A2Z1-X	TP-L-TS-G-H
		(1) - 36 FIBER OPGW		TO-L-TS-G-O
C*M-TN2KSBB-X2HS	(6) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD	TS-S2A2Z1-X	TP-L-TS-G-H
		(1) - 36 FIBER SPEC. OPGW		TO-L-TS-G-S
C*M-TN2KSBB-K2H2	(6) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S2A2Z1-K	(2) TP-L-TS-G-H
		(1) - 7#7 (7/16") AWLD		TP-L-TS-G-H
C*M-TN2KSBB-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-TN2KSBB-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-TN2KSBB-L2H2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S2A2Z1-L	(2) TP-L-TS-G-H
		(1) - 7#7 (7/16") AWLD		TP-L-TS-G-H
C*M-TN2KSBB-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-TN2KSBB-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

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

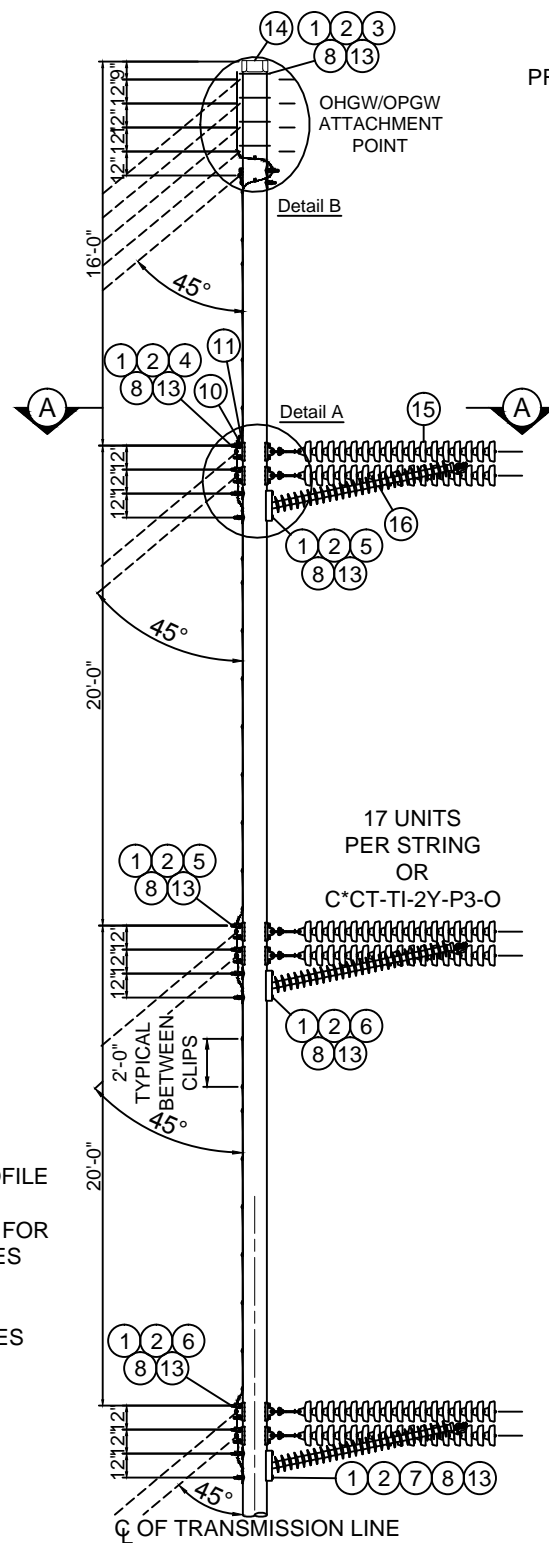
STRUCTURE STANDARDS - LAMINATED WOOD
230kV H-FRAME SINGLE CIRCUIT
ANGLE SUSPENSION STRUCTURE - SWINGING BRACKETS
FOR ANGLES 5° TO 20°

REVISION
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DATE
5/21/2015

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
B. Franklin	2/14/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015

TM2.23.TN-2JSBB-X

Sheet 2



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

REFER TO "TS" SECTION FOR CONDUCTOR SPECIFY

REFER TO "TG" SECTION FOR POLE GROUNDING C*CT-TG-02-002

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

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

BILL OF MATERIAL (Type of CU: POLE)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-2VDJL
1	20	EA	1000910800	NUT LCK MF SQ 7/8 BOLT GALV
2	10	EA	6000273770	NUT SQ 7/8" BOLT GALV
3	2	EA	1035475016	BOLT SQ HEAD 7/8 X 16 W/ SQ NUT (NOTE F)
4	4	EA	1035475018	BOLT SQ HEAD 7/8 X 18 W/ SQ NUT (NOTE F)
5	6	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE F)
6	6	EA	1035475022	BOLT SQ HEAD 7/8 X 22 W/ SQ NUT (NOTE F)
7	2	EA	1035475024	BOLT SQ HEAD 7/8 X 24 W/ SQ NUT (NOTE F)
8	20	EA	6000274612	WASHER HELICAL (7/8")
9	8	EA	6000274880	WASHER 4" SQ CURVED (7/8")
10	12	EA	6000274505	DEAD END TEE, 60K
11	12	EA	6000273231	GAIN GRID, 4-1/2" X 9", BONDING F/ 7/8 BOLTS
12	7	EA	6000274040	PLT POLE EYE 15/16 H
13	10	EA	6000251031	CLMP GRND WIRE U-CLIP 15/16" H
14	1	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: INSO) - SINGLE CONDUCTOR PER PHASE

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-17
15	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (17 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-O
15	6	EA	6000312023	INS POLY Y-BALL 30K 17 UNIT EQ. W/COR RING
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-HC
16	3	EA	6000310281	INS LINE POST 230KV W/ CLAMP FITTING & GAIN BASE

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
- TH GUYING ASSEMBLIES
- TK MARKINGS
- TR GUY ANCHORS

NOTE B: POLE DRILLING: ALL HOLES - 15/16" DIAMETER

NOTE C: IF CONDUCTOR NESC HEAVY LOADING TENSION IS LESS THAN 10,000#, USE STRAIN CLAMPS; IF NESC TENSION IS 10,000# OR GREATER, USE COMPRESSION DEAD END ASSEMBLIES.

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.

NOTE E: FOR SHALLOW ANGLES, THE STATIC WIRE IN-LINE GUYS MAY BE SHIFTED OUT OF DIRECT LINE IN ORDER TO MAINTAIN PROPER CLEARANCE TO THE PHASE CONDUCTORS.

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 SYSTEM ENGINEERING - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

NOTE G: USE A STEEL DEADEND STRUCTURE WHEN USING BUNDLED CONDUCTOR CONFIGURATION.

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

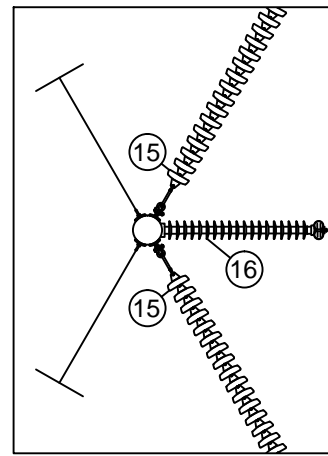


TRANSMISSION CONSTRUCTION STANDARDS MANUAL

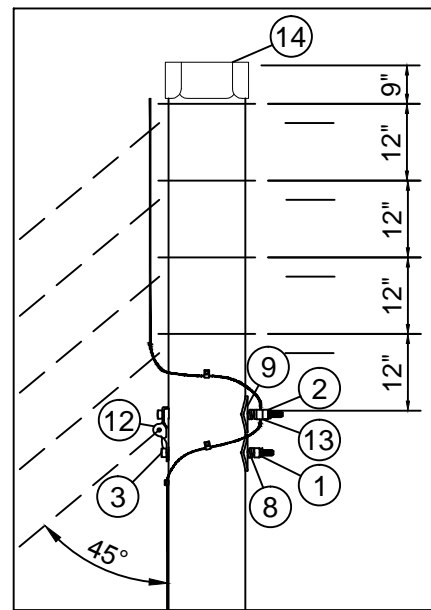
STRUCTURE STANDARDS - WOOD
230KV SINGLE POLE SINGLE CIRCUIT
VERTICAL DEADEND - 25° TO 60°

REVISION
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DATE
5/21/2015

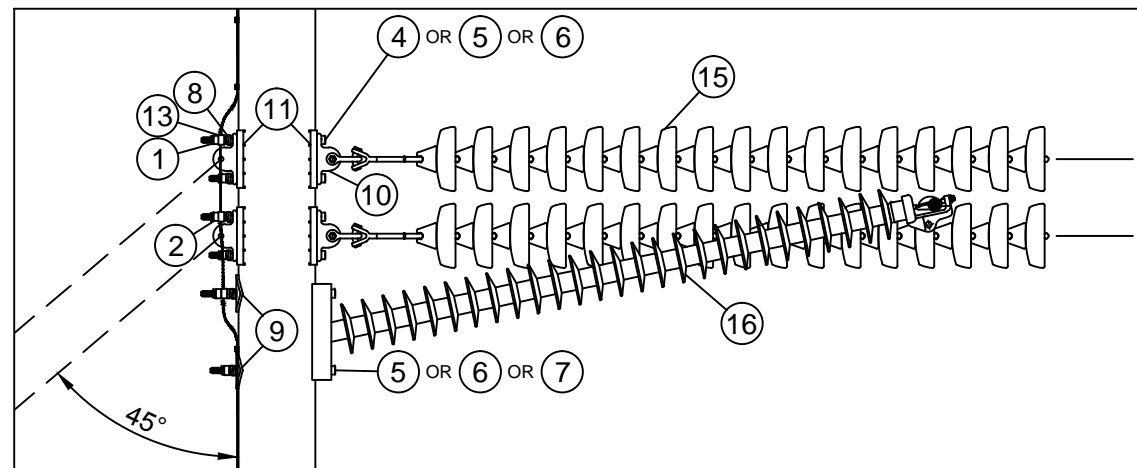
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:	TM2.23.TN-2VDJL-X	Sheet 1
B. Franklin	2/15/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015		



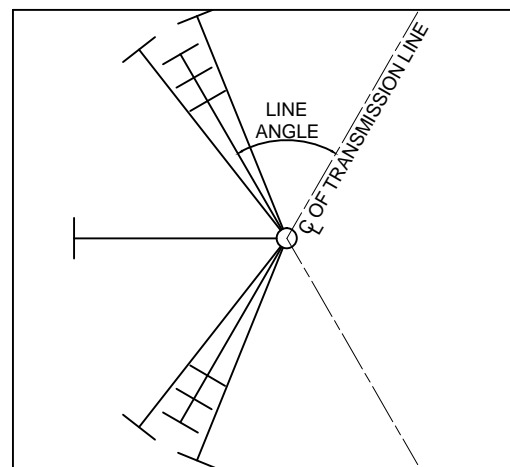
VIEW A-A



Detail 'B'
OHGW/OPGW ATTACHMENT
LOCATIONS



Detail 'A'
(ASSEMBLY SINGLE CONDUCTOR PER PHASE SHOWN)



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

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

BILL OF MATERIAL WITH STRAIN CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2VDJLF-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-X	(2) TP-W-AD-G-H
C*M-TN2VDJLF-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-X	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2VDJLF-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-X	TP-W-AD-G-H TO-W-AD-G-S
C*M-TN2VDJLF-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-K	(2) TP-W-AD-G-H
C*M-TN2VDJLF-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-K	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2VDJLF-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-K	TP-W-AD-G-H TO-W-AD-G-S
C*M-TN2VDJLF-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-L	(2) TP-W-AD-G-H
C*M-TN2VDJLF-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-L	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2VDJLF-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-L	TP-W-AD-G-H TO-W-AD-G-S

BILL OF MATERIAL WITH COMPRESSION DEADEND CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2VDJLG-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-C2P1-X	(2) TP-W-AD-G-H
C*M-TN2VDJLG-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-X	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2VDJLG-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-X	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2VDJLG-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-C2P1-K	(2) TP-W-AD-G-H
C*M-TN2VDJLG-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-K	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2VDJLG-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-K	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2VDJLG-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-C2P1-L	(2) TP-W-AD-G-H
C*M-TN2VDJLG-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-L	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2VDJLG-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-L	TP-W-AD-G-H TO-W-AD-G-O

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

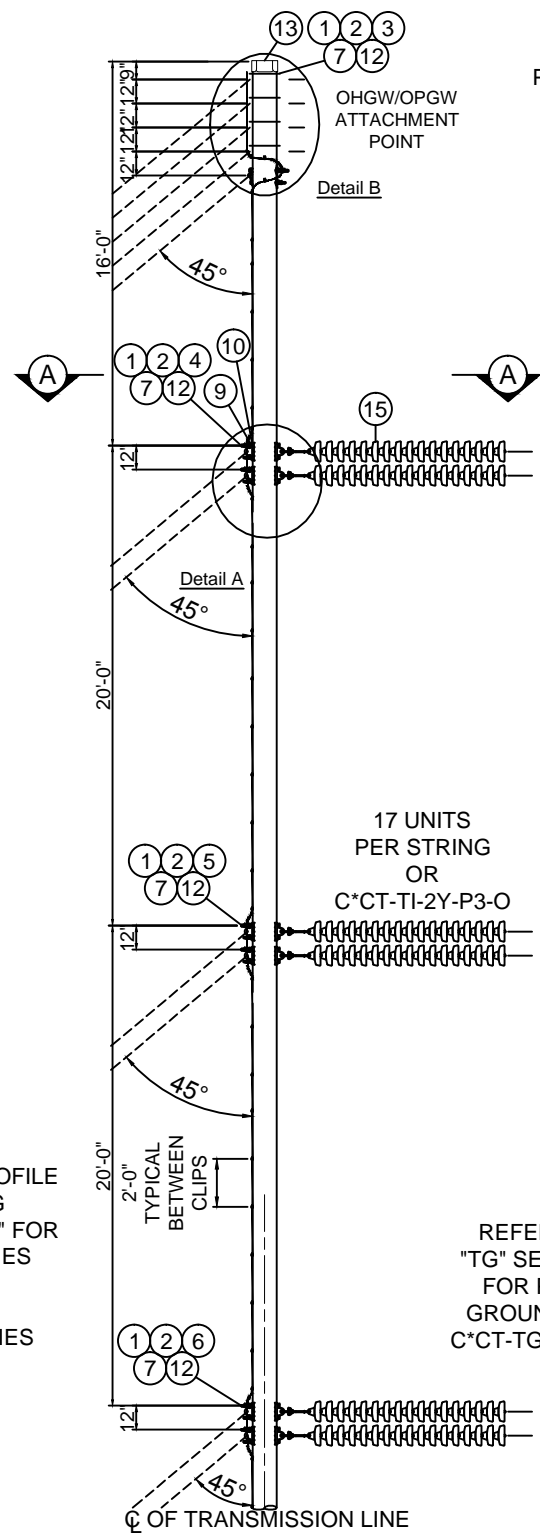
STRUCTURE STANDARDS - WOOD
230KV SINGLE POLE SINGLE CIRCUIT
VERTICAL DEADEND - 25° TO 60°

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-2VDJL-X

Sheet 2



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

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

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

REFER TO "TG" SECTION FOR POLE GROUNDING C*CT-TG-02-002

REFER TO "TS" SECTION FOR CONDUCTOR SPECIFY

17 UNITS PER STRING OR C*CT-TI-2Y-P3-O

BILL OF MATERIAL (Type of CU: POLE)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-2VDOB
1	14	EA	1000910800	NUT LCK MF SQ 7/8 BOLT GALV
2	7	EA	6000273770	NUT SQ 7/8" BOLT GALV
3	2	EA	1035475016	BOLT SQ HEAD 7/8 X 16 W/ SQ NUT (NOTE E)
4	4	EA	1035475018	BOLT SQ HEAD 7/8 X 18 W/ SQ NUT (NOTE E)
5	4	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE E)
6	4	EA	1035475022	BOLT SQ HEAD 7/8 X 22 W/ SQ NUT (NOTE E)
7	14	EA	6000274612	WASHER HELICAL (7/8")
8	2	EA	6000274880	WASHER 4" SQ CURVED (7/8")
9	12	EA	6000274505	DEAD END TEE, 60K
10	12	EA	6000273231	GAIN GRID, 4-1/2" X 9", BONDING F/ 7/8 BOLTS
11	1	EA	6000274040	PLT POLE EYE 15/16 H
12	7	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
13	1	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: INSO) - SINGLE CONDUCTOR PER PHASE

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-17
14	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (17 UNITS/STRING)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-O
14	6	EA	6000312023	INS POLY Y-BALL 30K 17 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
 - TH GUYING ASSEMBLIES
 - TK MARKINGS
 - TR GUY ANCHORS

NOTE B: POLE DRILLING: ALL HOLES - 15/16" DIAMETER

NOTE C: IF CONDUCTOR NESC HEAVY LOADING TENSION IS LESS THAN 10,000#, USE STRAIN CLAMPS; IF NESC TENSION IS 10,000# OR GREATER, USE COMPRESSION DEAD END ASSEMBLIES.

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.

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 SYSTEM ENGINEERING - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

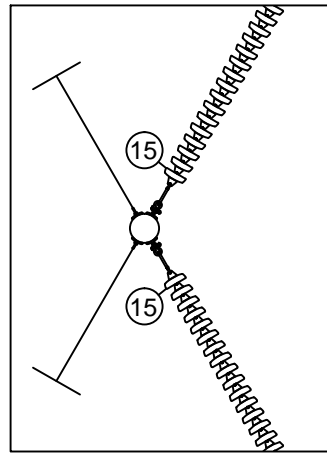
NOTE F: USE A STEEL DEADEND STRUCTURE WHEN USING BUNDLED CONDUCTOR CONFIGURATION.

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

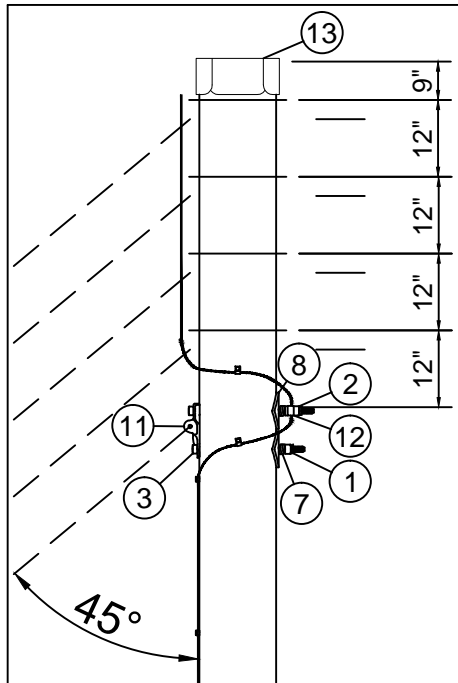
Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.

Drawing Scale: N/A

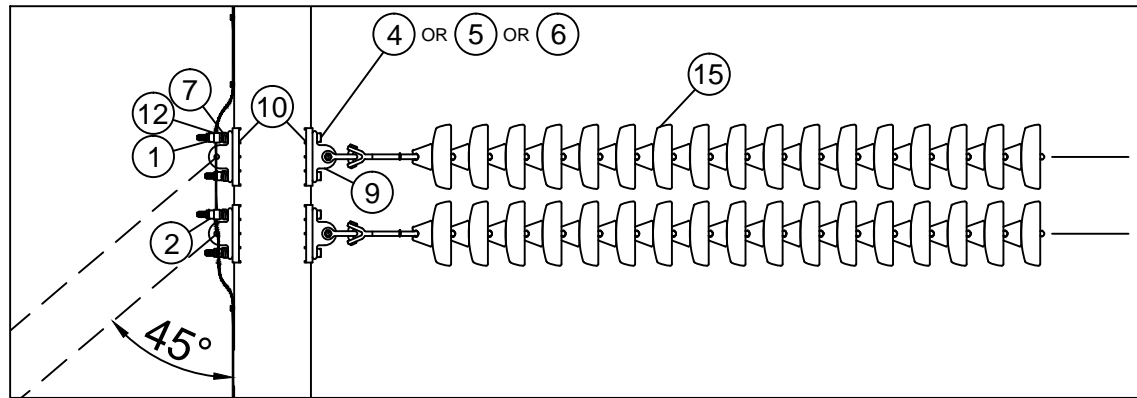
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			DATE
			5/21/2015
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:
B. Franklin	2/15/2013	Becken/Hart	3/18/2015
Approved By:	Date App.:	TM2.23.TN-2VDOB-X	
Barry R. Hart	5/20/2015	Sheet 1	



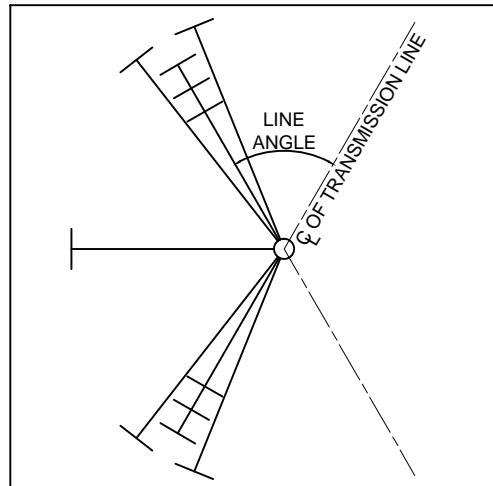
VIEW A-A



Detail 'B'
OHGW/OPGW ATTACHMENT
LOCATIONS



Detail 'A'
(ASSEMBLY SINGLE CONDUCTOR PER PHASE SHOWN)



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.

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

BILL OF MATERIAL WITH STRAIN CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2VDOBC-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-N2L1-X	(2) TP-W-AD-G-H
C*M-TN2VDOBC-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2L1-X	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2VDOBC-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2L1-X	TP-W-AD-G-H TO-W-AD-G-S
C*M-TN2VDOBC-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-N2L1-K	(2) TP-W-AD-G-H
C*M-TN2VDOBC-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2L1-K	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2VDOBC-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2L1-K	TP-W-AD-G-H TO-W-AD-G-S
C*M-TN2VDOBC-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-N2L1-L	(2) TP-W-AD-G-H
C*M-TN2VDOBC-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2L1-L	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2VDOBC-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2L1-L	TP-W-AD-G-H TO-W-AD-G-S

BILL OF MATERIAL WITH COMPRESSION DEADEND CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2VDOBD-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-C2-X	(2) TP-W-AD-G-H
C*M-TN2VDOBD-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2-X	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2VDOBD-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2-X	TP-W-AD-G-H TO-W-AD-G-S
C*M-TN2VDOBD-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-C2-K	(2) TP-W-AD-G-H
C*M-TN2VDOBD-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2-K	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2VDOBD-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2-K	TP-W-AD-G-H TO-W-AD-G-S
C*M-TN2VDOBD-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-C2-L	(2) TP-W-AD-G-H
C*M-TN2VDOBD-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2-L	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2VDOBD-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2-L	TP-W-AD-G-H TO-W-AD-G-S

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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
230KV SINGLE POLE SINGLE CIRCUIT
VERTICAL DEADEND - 60° AND GREATER

REVISION
00
DATE
5/21/2015

Drwn. By: B. Franklin
Date Dr.: 2/15/2013

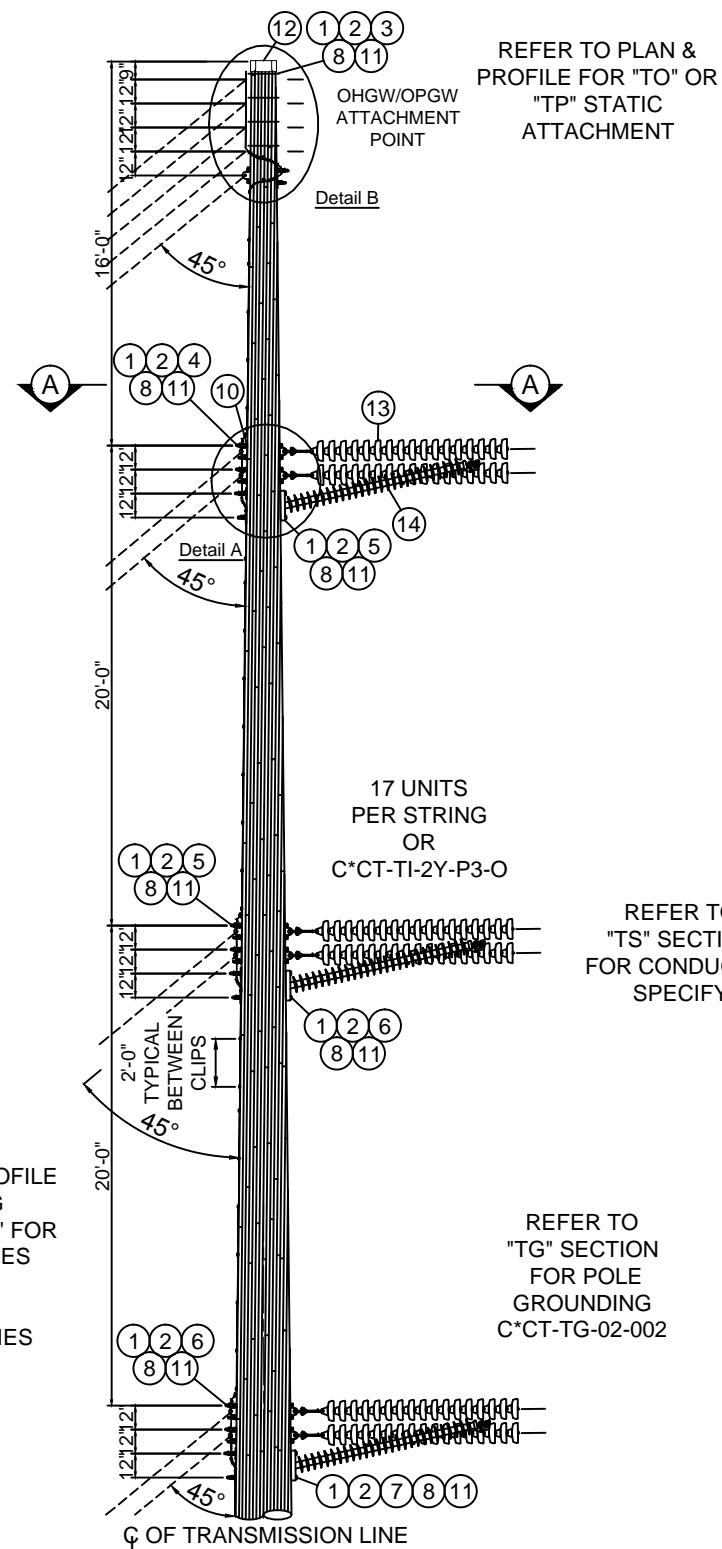
Checked By: Becken/Hart

Date Ck.: 3/18/2015

Approved By: Barry R. Hart
Date App.: 5/20/2015

TM2.23.TN-2VDOB-X

Sheet 2



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

Detail B

Detail A

17 UNITS PER STRING OR C*CT-TI-2Y-P3-O

REFER TO "TS" SECTION FOR CONDUCTOR SPECIFY

REFER TO "TG" SECTION FOR POLE GROUNDING C*CT-TG-02-002

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

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

☐ OF TRANSMISSION LINE

BILL OF MATERIAL (Type of CU: POLE)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-2XDJL
1	20	EA	1000910800	NUT LCK MF SQ 7/8 BOLT GALV
2	10	EA	6000273770	NUT SQ 7/8" BOLT GALV
3	2	EA	1035475016	BOLT SQ HEAD 7/8 X 16 W/ SQ NUT (NOTE F)
4	4	EA	1035475018	BOLT SQ HEAD 7/8 X 18 W/ SQ NUT (NOTE F)
5	6	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE F)
6	6	EA	1035475022	BOLT SQ HEAD 7/8 X 22 W/ SQ NUT (NOTE F)
7	2	EA	1035475024	BOLT SQ HEAD 7/8 X 24 W/ SQ NUT (NOTE F)
8	20	EA	6000274612	WASHER HELICAL (7/8")
9	8	EA	1000946500	WASHER 4" SQ FLAT (7/8")
10	13	EA	6000274505	DEAD END TEE, 60K
11	10	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
12	1	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: INSO) - SINGLE CONDUCTOR PER PHASE

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-17
13	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (17 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-O
13	6	EA	6000312023	INS POLY Y-BALL 30K 17 UNIT EQ. W/COR RING
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-HF
14	3	EA	6000310283	INS LINE POST 230KV W/ CLAMP FITTING & FLAT BASE

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
 - TH GUYING ASSEMBLIES
 - TK MARKINGS
 - TR GUY ANCHORS

NOTE B: POLE DRILLING: ALL HOLES - 15/16" DIAMETER

NOTE C: IF CONDUCTOR NESC HEAVY LOADING TENSION IS LESS THAN 10,000#, USE STRAIN CLAMPS; IF NESC TENSION IS 10,000# OR GREATER, USE COMPRESSION DEAD END ASSEMBLIES.

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.

NOTE E: FOR SHALLOW ANGLES, THE STATIC WIRE IN-LINE GUYS MAY BE SHIFTED OUT OF DIRECT LINE IN ORDER TO MAINTAIN PROPER CLEARANCE TO THE PHASE CONDUCTORS.

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 SYSTEM ENGINEERING - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

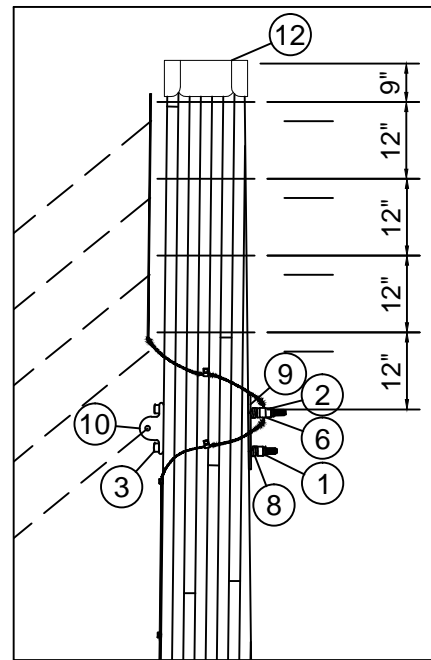
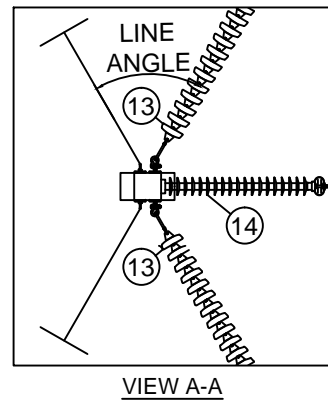
NOTE G: USE A STEEL DEADEND STRUCTURE WHEN USING BUNDLED CONDUCTOR CONFIGURATION.

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

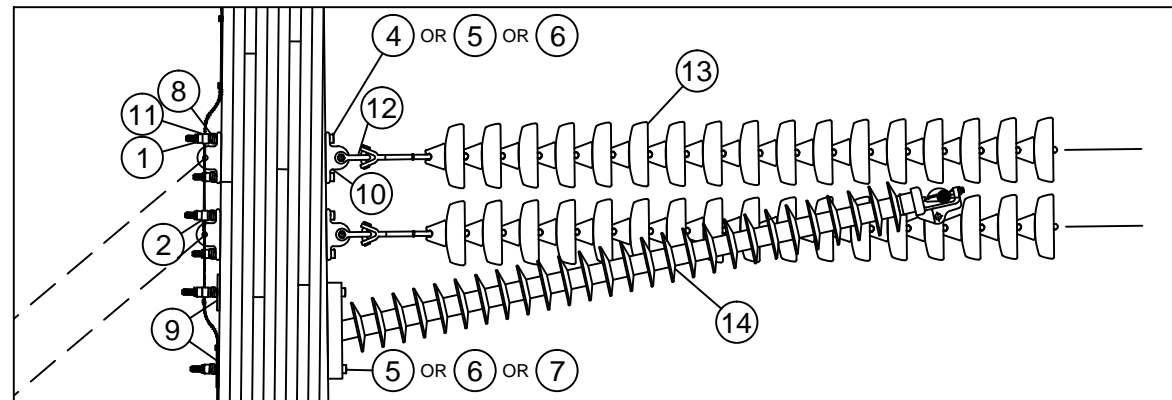
Contact Engineering Standards - Transmission Section for the creation of new standards and CUs.

Drawing Scale: N/A

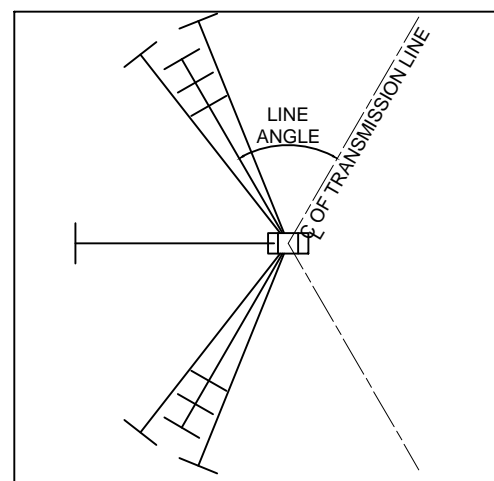
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			00
			DATE
			5/21/2015
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:
B. Franklin	2/15/2013	Becken/Hart	3/18/2015
Approved By:	Date App.:	TM2.23.TN-2XDJL-X	
Barry R. Hart	5/20/2015	Sheet 1	



Detail 'B'
OHGW/OPGW ATTACHMENT
LOCATIONS



Detail 'A'
(ASSEMBLY SINGLE CONDUCTOR PER PHASE SHOWN)



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.

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

BILL OF MATERIAL WITH STRAIN CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2XDJLF-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-X	(2) TP-W-AD-G-H
C*M-TN2XDJLF-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-X	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2XDJLF-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-X	TP-W-AD-G-H TO-W-AD-G-S
C*M-TN2XDJLF-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-K	(2) TP-W-AD-G-H
C*M-TN2XDJLF-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-K	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2XDJLF-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-K	TP-W-AD-G-H TO-W-AD-G-S
C*M-TN2XDJLF-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-L	(2) TP-W-AD-G-H
C*M-TN2XDJLF-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-L	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2XDJLF-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-L	TP-W-AD-G-H TO-W-AD-G-S

BILL OF MATERIAL WITH COMPRESSION DEADEND CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2XDJLG-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-C2P1-X	(2) TP-W-AD-G-H
C*M-TN2XDJLG-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-X	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2XDJLG-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-X	TP-W-AD-G-H TO-W-AD-G-S
C*M-TN2XDJLG-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-C2P1-K	(2) TP-W-AD-G-H
C*M-TN2XDJLG-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-K	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2XDJLG-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-K	TP-W-AD-G-H TO-W-AD-G-S
C*M-TN2XDJLG-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-C2P1-L	(2) TP-W-AD-G-H
C*M-TN2XDJLG-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-L	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2XDJLG-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-L	TP-W-AD-G-H TO-W-AD-G-S

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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

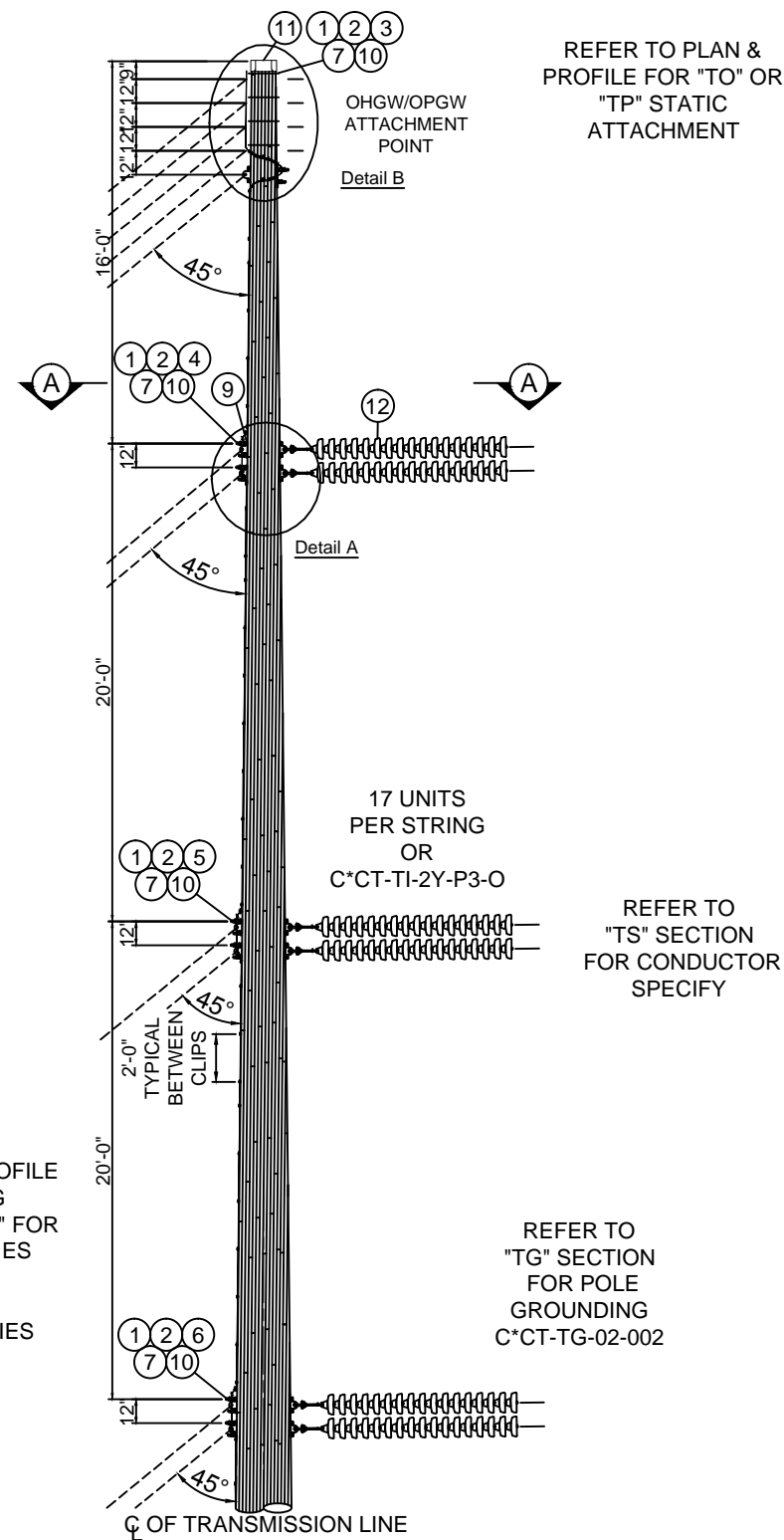
STRUCTURE STANDARDS - LAMINATED WOOD
230KV SINGLE POLE SINGLE CIRCUIT
VERTICAL DEADEND - 25° TO 60°

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-2XDJL-X

Sheet 2



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

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

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

REFER TO "TG" SECTION FOR POLE GROUNDING C*CT-TG-02-002

REFER TO "TS" SECTION FOR CONDUCTOR SPECIFY

17 UNITS PER STRING OR C*CT-TI-2Y-P3-O

BILL OF MATERIAL (Type of CU: POLE)

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TN-2XDOB
1	22	EA	1000910800	NUT LCK MF SQ 7/8 BOLT GALV
2	11	EA	6000273770	NUT SQ 7/8" BOLT GALV
3	10	EA	1035475016	BOLT SQ HEAD 7/8 X 16 W/ SQ NUT (NOTE E)
4	4	EA	1035475018	BOLT SQ HEAD 7/8 X 18 W/ SQ NUT (NOTE E)
5	4	EA	1035475020	BOLT SQ HEAD 7/8 X 20 W/ SQ NUT (NOTE E)
6	4	EA	1035475022	BOLT SQ HEAD 7/8 X 22 W/ SQ NUT (NOTE E)
7	22	EA	6000274612	WASHER HELICAL (7/8")
8	2	EA	1000946500	WASHER 4" SQ FLAT (7/8")
9	21	EA	6000274505	DEAD END TEE, 60K
10	11	EA	1036200007	CLMP GRND WIRE U-CLIP 15/16" H
11	1	EA	6000820052	POLE TOPPER 19"

BILL OF MATERIAL (Type of CU: INSO) - SINGLE CONDUCTOR PER PHASE

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-9P-D5-17
12	6 CUs	EA	6000310768	INS SUS CL52-5 30K M&E GRY (17 UNITS/STRING)
ITEM NO.	QTY.	UOM	IUSA MID	CU: C*CT-TI-2Y-P3-O
12	6	EA	6000312023	INS POLY Y-BALL 30K 17 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
- TH GUYING ASSEMBLIES
- TK MARKINGS
- TR GUY ANCHORS

NOTE B: POLE DRILLING: ALL HOLES - 15/16" DIAMETER

NOTE C: IF CONDUCTOR NESC HEAVY LOADING TENSION IS LESS THAN 10,000#, USE STRAIN CLAMPS; IF NESC TENSION IS 10,000# OR GREATER, USE COMPRESSION DEAD END ASSEMBLIES.

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.

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 SYSTEM ENGINEERING - TRANSMISSION SECTION IF YOU NEED ASSISTANCE.

NOTE F: USE A STEEL DEADEND STRUCTURE WHEN USING BUNDLED CONDUCTOR CONFIGURATION.

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

Drawing Scale: N/A

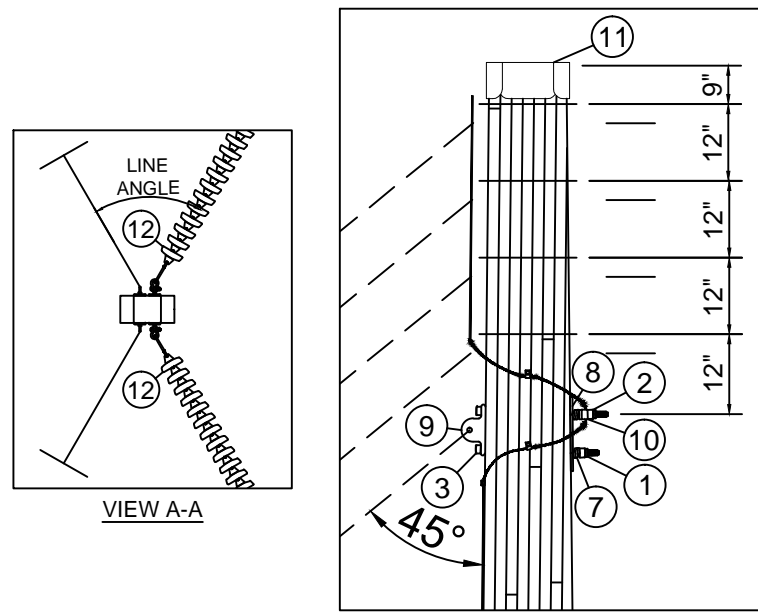


TRANSMISSION CONSTRUCTION STANDARDS MANUAL

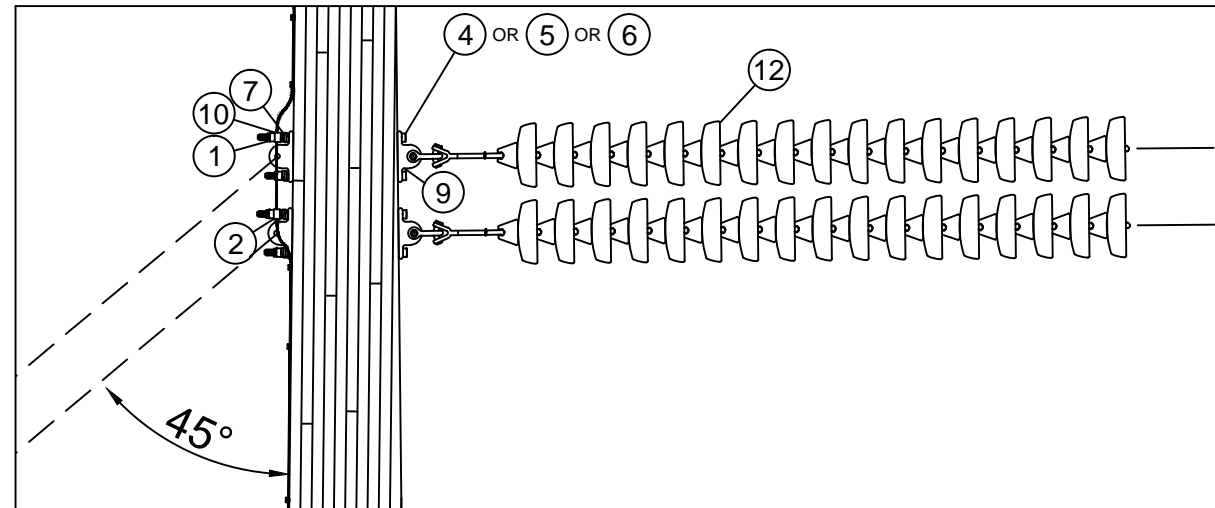
STRUCTURE STANDARDS - LAMINATED WOOD
230KV SINGLE POLE SINGLE CIRCUIT
VERTICAL DEADEND - 60° AND GREATER

REVISION	00
DATE	5/21/2015

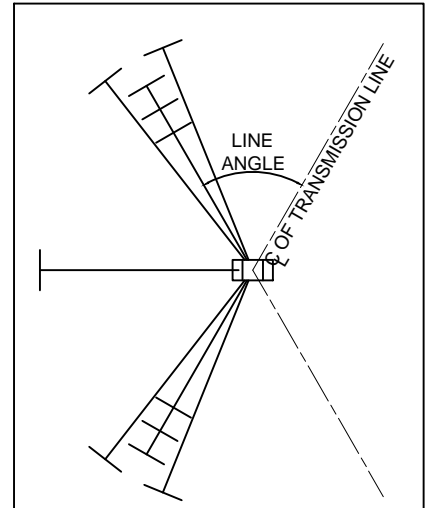
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:	TM2.23.TN-2XDOB-X	Sheet 1
B. Franklin	2/15/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015		



Detail 'B'
OHGW/OPGW ATTACHMENT
LOCATIONS



Detail 'A'
(ASSEMBLY SINGLE CONDUCTOR PER PHASE SHOWN)



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.

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

BILL OF MATERIAL WITH STRAIN CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2XDOBC-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-X	(2) TP-W-AD-G-H
C*M-TN2XDOBC-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-X	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2XDOBC-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-X	TP-W-AD-G-H TO-W-AD-G-S
C*M-TN2XDOBC-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-K	(2) TP-W-AD-G-H
C*M-TN2XDOBC-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-K	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2XDOBC-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-K	TP-W-AD-G-H TO-W-AD-G-S
C*M-TN2XDOBC-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-N2P1L1-L	(2) TP-W-AD-G-H
C*M-TN2XDOBC-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-N2P1L1-L	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2XDOBC-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-N2P1L1-L	TP-W-AD-G-H TO-W-AD-G-S

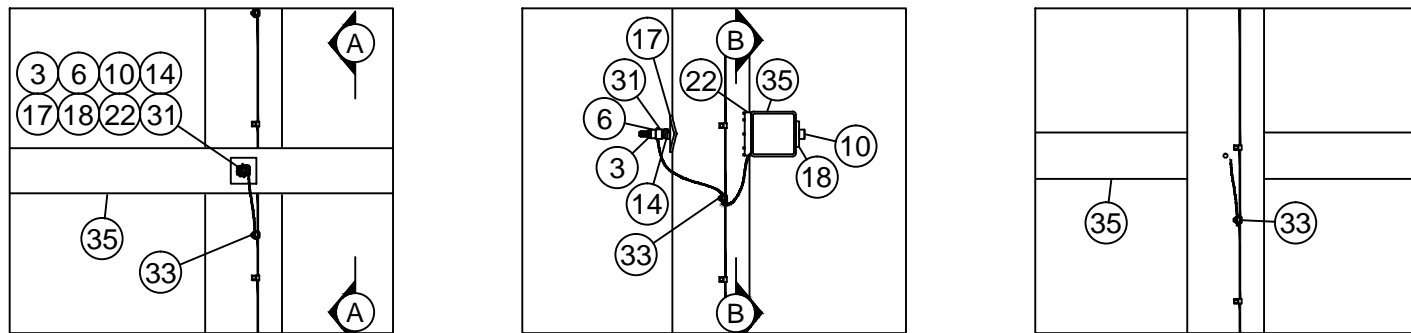
BILL OF MATERIAL WITH COMPRESSION DEADEND CLAMPS

CU MACRO	CONDUCTOR	STATIC	COND SPECIFY	STATIC SPECIFY
C*M-TN2XDOBD-X-H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-C2P1-X	(2) TP-W-AD-G-H
C*M-TN2XDOBD-X-HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-X	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2XDOBD-X-HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-X	TP-W-AD-G-H TO-W-AD-G-S
C*M-TN2XDOBD-K-H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-C2P1-K	(2) TP-W-AD-G-H
C*M-TN2XDOBD-K-HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-K	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2XDOBD-K-HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-K	TP-W-AD-G-H TO-W-AD-G-S
C*M-TN2XDOBD-L-H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-C2P1-L	(2) TP-W-AD-G-H
C*M-TN2XDOBD-L-HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-C2P1-L	TP-W-AD-G-H TO-W-AD-G-O
C*M-TN2XDOBD-L-HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-C2P1-L	TP-W-AD-G-H TO-W-AD-G-S

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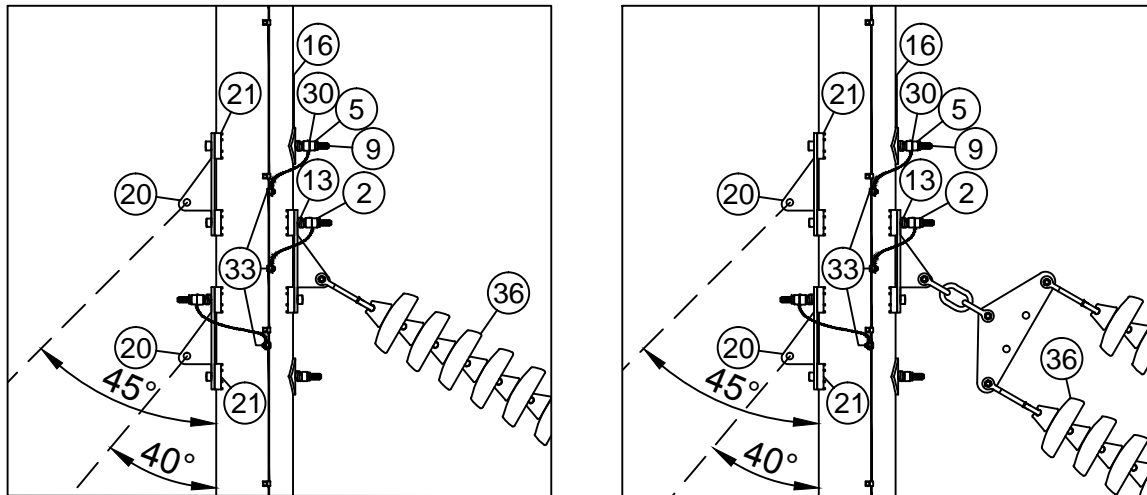
	TRANSMISSION CONSTRUCTION STANDARDS MANUAL	STRUCTURE STANDARDS - LAMINATED WOOD 230KV SINGLE POLE SINGLE CIRCUIT VERTICAL DEADEND - 60° AND GREATER	REVISION
			00
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			5/21/2015
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:
B. Franklin	2/15/2013	Becken/Hart	3/18/2015
Approved By:	Date App.:	TM2.23.TN-2XDOB-X	
Barry R. Hart	5/20/2015	Sheet 2	



Detail 'A'

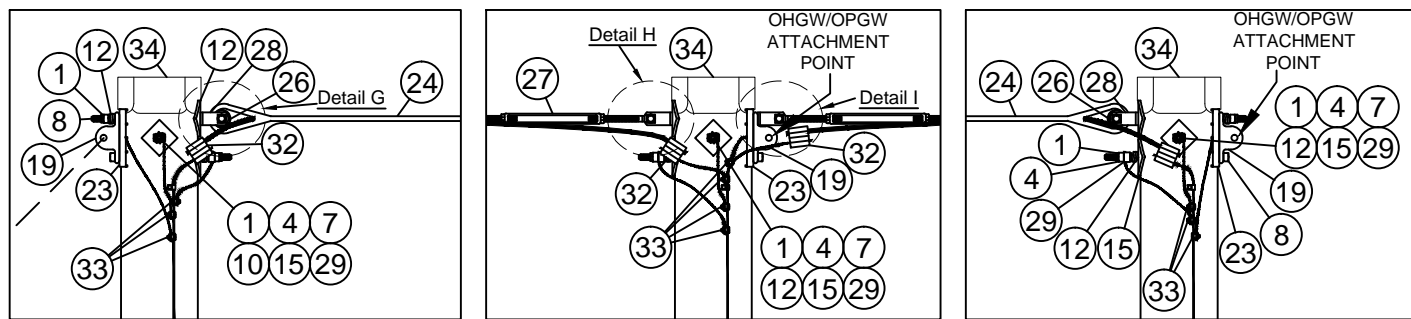
Section A-A

Section B-B



Detail 'C'
SINGLE CONDUCTOR PER PHASE

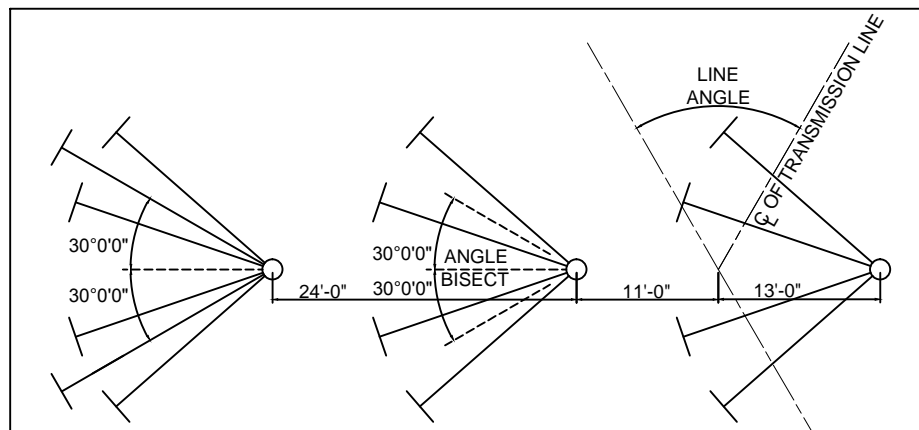
Detail 'C'
TWO CONDUCTORS PER PHASE



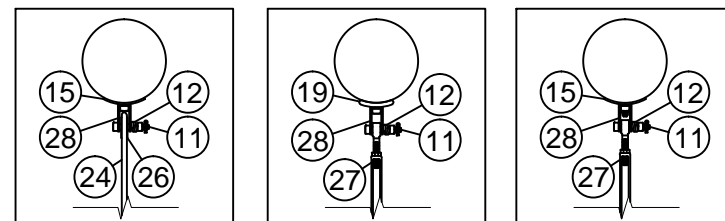
Detail 'D'

Detail 'E'

Detail 'F'



GUYING PLAN



Detail 'G'

Detail 'H'

Detail 'I'

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-TN2HA0BA-X2H2	(3) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-S4A1-X	(2) TP-W-A1-G-H
C*M-TN2HA0BA-X2HO	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S4A1-X	TP-W-A1-G-H TO-W-A2-G-O
C*M-TN2HA0BA-X2HS	(3) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S4A1-X	TP-W-A1-G-H TO-W-A2-G-S
C*M-TN2HA0BA-K2H2	(3) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S4A1-K	(2) TP-W-A1-G-H
C*M-TN2HA0BA-K2HO	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S4A1-K	TP-W-A1-G-H TO-W-A2-G-O
C*M-TN2HA0BA-K2HS	(3) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S4A1-K	TP-W-A1-G-H TO-W-A2-G-S
C*M-TN2HA0BA-L2H2	(3) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S4A1-L	(2) TP-W-A1-G-H
C*M-TN2HA0BA-L2HO	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S4A1-L	TP-W-A1-G-H TO-W-A2-G-O
C*M-TN2HA0BA-L2HS	(3) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S4A1-L	TP-W-A1-G-H TO-W-A2-G-S
C*M-TN2IA0BA-X2B2	(6) - 795 ACSR 26/7	(2) - 7#7 (7/16") AWLD	TS-S5A2D1-X	(2) TP-W-A1-G-H
C*M-TN2IA0BA-X2BO	(6) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S5A2D1-X	TP-W-A1-G-H TO-W-A2-G-O
C*M-TN2IA0BA-X2BS	(6) - 795 ACSR 26/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S5A2D1-X	TP-W-A1-G-H TO-W-A2-G-S
C*M-TN2IA0BA-K2B2	(6) - 1192 ACSR 45/7	(2) - 7#7 (7/16") AWLD	TS-S5A2D1-K	(2) TP-W-A1-G-H
C*M-TN2IA0BA-K2BO	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S5A2D1-K	TP-W-A1-G-H TO-W-A2-G-O
C*M-TN2IA0BA-K2BS	(6) - 1192 ACSR 45/7	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S5A2D1-K	TP-W-A1-G-H TO-W-A2-G-S
C*M-TN2IA0BA-L2B2	(6) - 1590 ACSR 54/19	(2) - 7#7 (7/16") AWLD	TS-S5A2D1-L	(2) TP-W-A1-G-H
C*M-TN2IA0BA-L2BO	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER OPGW	TS-S5A2D1-L	TP-W-A1-G-H TO-W-A2-G-O
C*M-TN2IA0BA-L2BS	(6) - 1590 ACSR 54/19	(1) - 7#7 (7/16") AWLD (1) - 36 FIBER SPEC. OPGW	TS-S5A2D1-L	TP-W-A1-G-H TO-W-A2-G-S

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Drawing Scale: N/A



TRANSMISSION
CONSTRUCTION
STANDARDS
MANUAL

STRUCTURE STANDARDS - WOOD
230KV H-FRAME SINGLE CIRCUIT
H-FRAME RUNNING ANGLE - 30° TO 45° SINGLE STEEL CROSSARM

REVISION	00
DATE	5/21/2015

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.

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
B. Franklin	2/14/2013	Becken/Hart	3/18/2015	Barry R. Hart	5/20/2015

TM2.23.TN-2HA0B-X

Sheet 2