

GENERAL FOUNDATION INFORMATION					ANCHOR BOLTS		LONG. REINFORCEMENT			AREA 1			AREA 2			AREA 3			
STR. #	"H" (FT.)	"S" (FT.)	"R" (FT.)	"D" (FT.)	"A" (FT.)	# OF ANCHOR BOLTS	"C" (FT.)	LONG. BARS SIZE	# OF LONG. BARS	TIE SIZE	# OF TIES	TIE SPACING (IN.)	TIE SIZE	# OF TIES	TIE SPACING (IN.)	TIE SIZE	# OF TIES	TIE SPACING (IN.)	

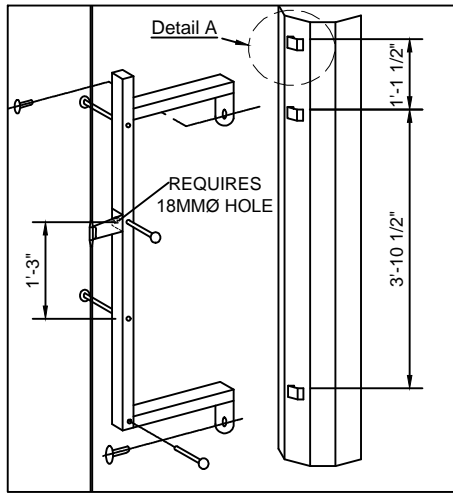
- NOTE A: ALL TRANSMISSION STRUCTURE FOUNDATIONS SHALL BE REINFORCED CONCRETE DRILLED PIER FOUNDATIONS.
- NOTE B: DESIGNER SHALL PERFORM GEOTECHNICAL SUBSURFACE INVESTIGATION AT EACH FOUNDATION LOCATION. THE DEPTH OF THE INVESTIGATION SHALL BE A MINIMUM OF 20' OR THE ESTIMATED DEPTH OF THE FOUNDATION PLUS 5'. IF THE INVESTIGATION ENCOUNTERS BEDROCK A MINIMUM OF 10' OF ROCK CORE SHALL BE OBTAINED AS PART OF THE INVESTIGATION.
- NOTE C: THE FOUNDATION DESIGN SHALL NOT ACCOUNT FOR THE TOP TWO FEET OF SOIL.
- NOTE D: THE FOUNDATION DESIGN SHALL WITHSTAND ALL SERVICE LOADS WITH A MINIMUM FACTOR OF SAFETY OF 3.0.
- NOTE E: CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH (F<sub>c</sub>) OF 4,000 PSI.
- NOTE F: REINFORCING BAR AND ANCHOR BOLT DEVELOPMENT LENGTH CALCULATIONS SHALL BE PERFORMED ASSUMING A 3,000 PSI CONCRETE.
- NOTE G: REINFORCING BARS SHALL MAINTAIN 3" CLEAR COVER FROM TOP AND BOTTOM OF FOUNDATION AND 6" CLEAR COVER FROM SIDES OF FOUNDATION.
- NOTE H: ALL LONGITUDINAL REINFORCING BARS SHALL BE THE SAME SIZE.
- NOTE I: LONGITUDINAL REINFORCING BARS SHALL BE EVENLY DISTRIBUTED AROUND THE FOUNDATION.
- NOTE J: THERE SHALL BE AN EQUAL NUMBER OF LONGITUDINAL REINFORCING BARS IN EACH QUADRANT. (I.E. NUMBER OF LONGITUDINAL REINFORCING BARS SHALL BE EVENLY DIVISIBLE BY 4).
- NOTE K: ALL SHEAR TIES SHALL BE THE SAME SIZE THROUGHOUT THE FOUNDATION.
- NOTE L: ANCHOR BOLT CAGES MAY BE "DRY SET" OR "WET SET".

- NOTE M: ANCHOR BOLT CAGES SHALL BE INSTALLED SUCH THAT ONCE THE CONCRETE HAS CURED THE ANCHOR BOLTS ARE EACH WITHIN 1/16" OF THE DESIGN LOCATION AND PLUMB WITHIN 1/8" OVER THE ANCHOR ROD PROJECTION.
- NOTE N: THE TOP EDGE OF THE FOUNDATION SHALL HAVE A 2" CHAMFER.
- NOTE O: IF REINFORCING BARS ARE DESIGNED TO BE DOWELED INTO THE BEDROCK BELOW THE FOUNDATION THE REINFORCING BARS SHALL BE INSTALLED USING BASF MASTERFLOW 713+ NON-SHRINK CEMENT GROUT.
- NOTE P: IF REINFORCING BARS ARE DESIGNED TO BE DOWELED INTO THE BEDROCK THE DESIGNER SHALL SUBMIT A DETAILED DESIGN DRAWING SHOWING THE REINFORCING BARS TO BE DOWELED.

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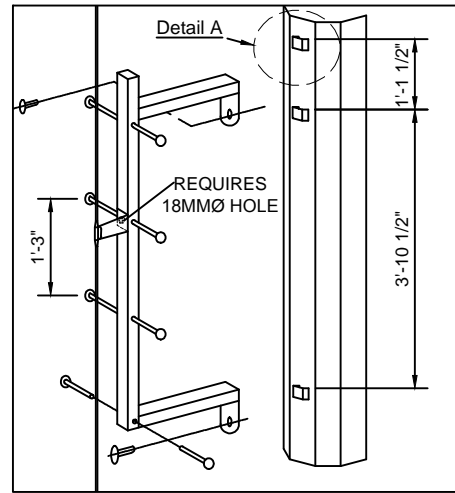
Contact Engineering Standards - Transmission Section for the creation of new standards and CUs. Drawing Scale: 1" = 30"

 <b>IBERDROLA USA</b>	<b>TRANSMISSION CONSTRUCTION STANDARDS MANUAL</b>	<b>STRUCTURE STANDARDS - STEEL FOUNDATION DETAIL FOR STEEL POLES DRILLED PIER</b>	REVISION 00
			DATE 5/21/2015
Drwn. By: B. Franklin	Date Dr.: 9/09/2014	Checked By: Becken/Hart	Date Ck.: 3/05/2015
Approved By: Barry R. Hart	Date App.: 4/09/2015	<b>TM2.23.TE-01-001</b>	
			Sheet 1

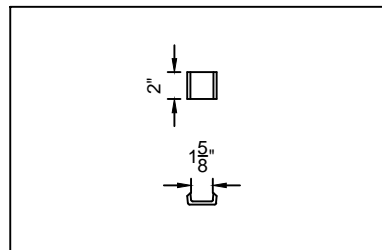


CLIMBING LADDER DETAIL

NOTE A



WORKING LADDER DETAIL



Detail 'A'  
LADDER CLIP DETAIL  
SCALE: 1" = 15"

NOTE A: CLIMBING LADDERS SHALL BE PERMANENT INSTALLATIONS. STEEL POLE MANUFACTURER TO PROVIDE LADDERS.

NOTE B: THERE SHALL BE A STRAIGHT PATH OF LADDERS, FREE OF OBSTRUCTION (CONDUCTOR OR GUY ATTACHMENT) FROM THE POINT WHERE PERMANENT LADDERS BEGIN TO THE TOP OF THE STRUCTURE.

NOTE C: LADDER CLIPS SHALL BE POSITIONED SUCH THAT TRANSIT TO ALL SIDES OF THE POLE IS POSSIBLE ABOVE AND BELOW ALL CONDUCTOR, GUY AND ARM CONNECTIONS.

NOTE D: LADDERS SHALL BE STANDARD "MACGREGOR" TYPE LADDERS.

NOTE E: THERE SHALL BE NO LADDERS LESS THAN 12' FROM FINAL GRADE.

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Drawing Scale: 1" = 30"



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CONSTRUCTION  
STANDARDS  
MANUAL

STRUCTURE STANDARDS - STEEL  
LADDERS FOR STEEL STRUCTURES

REVISION

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Date Dr.: 4/16/2013

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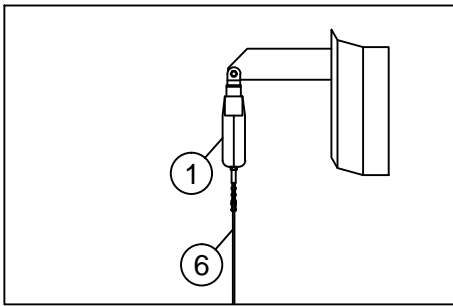
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Approved By: Barry R. Hart

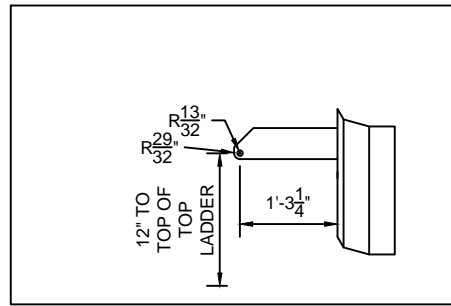
Date App.: 4/09/2015

TM2.23.TE-06-001

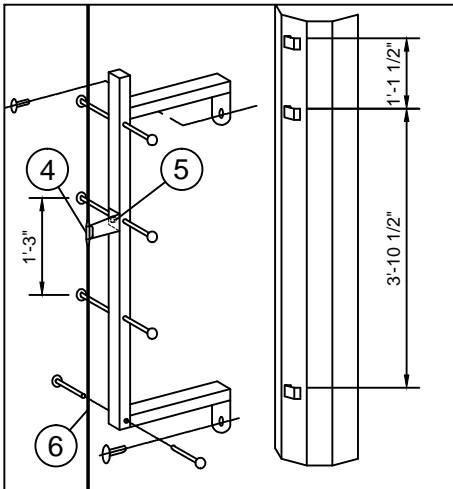
Sheet 1



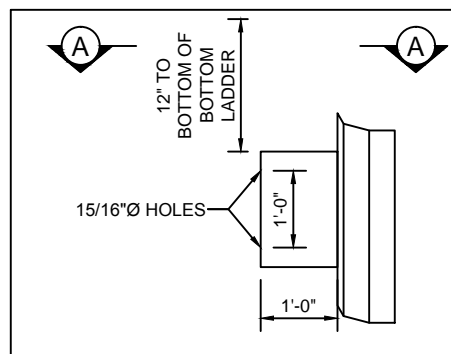
FALL ARREST TOP ANCHOR  
WITH CONSTANT DESCENT FORCE  
ENERGY ABSORBING DEVICE



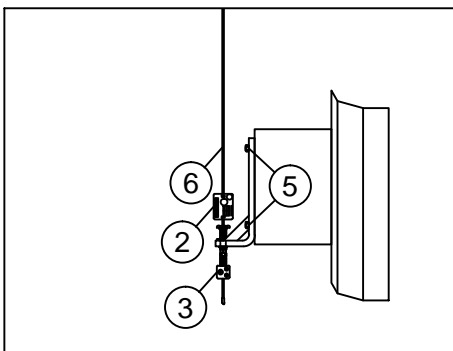
FALL ARREST TOP ANCHOR VANG  
MINIMUM VERTICAL LOAD CAPACITY: 5 KIPS



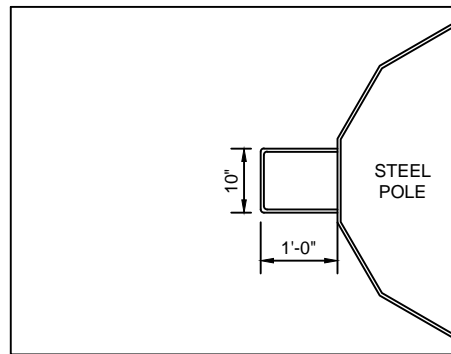
FALL ARREST SYSTEM  
INTERMEDIATE SUPPORT MOUNTED TO  
EVERY OTHER LADDER



FALL ARREST BOTTOM ANCHOR ATTACHMENT  
MINIMUM VERTICAL LOAD CAPACITY: 5 KIPS



FALL ARREST BOTTOM ANCHOR  
WITH NO-SWAGE TENSIONING DEVICE  
AND WARNING TAG



Section 'A-A'  
FALL ARREST BOTTOM ANCHOR ATTACHMENT  
MINIMUM VERTICAL LOAD CAPACITY: 5 KIPS

NOTE A: MAXIMUM VANG PLATE THICKNESS SHALL NOT BE GREATER THAN 3/4"

NOTE B: STEEL POLE MANUFACTURER SHALL ALIGN FALL ARREST VANGS WITH THE STRAIGHTEST PATH OF LADDERS INSTALLED FROM TOP TO BOTTOM OF THE STRUCTURE.

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

Drawing Scale: 1" = 30"



TRANSMISSION  
CONSTRUCTION  
STANDARDS  
MANUAL

STRUCTURE STANDARDS - STEEL  
FALL PROTECTION SYSTEMS  
FOR STEEL STRUCTURES

REVISION
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Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
B. Franklin	2/11/2013	Becken/Hart	9/5/2013	Barry R. Hart	4/09/2015

TM2.23.TE-06-002

Sheet 1

**BILL OF MATERIAL (Type of CU: POLE)**

ITEM NO.	QTY.	UOM	IUSA MID	CU: C*PT-TE-06-002
1	1	EA	6000618000	LATCHWAYS CONSTANT FORCE ENERGY ABSORBER - 3 MAN
2	1	EA	6000618010	LATCHWAYS CABLE WARNING TAG
3	1	EA	6000618020	LATCHWAYS BOTTOM ANCHOR & SWAGE-FREE CABLE TENSIONING DEVICE
4	20	EA	6000618030	LATCHWAYS MANSAFE THRU BOLT INTERMEDIATE HELIX CABLE GUIDE
5	22	EA	6000618040	LATCHWAYS MANSAFE THRU BOLT FIXING KIT
6	150	FT	6000618050	LATCHWAYS SS 8MM DIAM. 1 X 19 CABLE

CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 35KV 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: MAXIMUM VANG PLATE THICKNESS SHALL NOT BE GREATER THAN 3/4"

NOTE B: STEEL POLE MANUFACTURER SHALL ALIGN FALL ARREST VANGS WITH THE STRAIGHTEST PATH OF LADDERS INSTALLED FROM TOP TO BOTTOM OF THE STRUCTURE.

NOTE C: ON A MULTI-POLE STRUCTURE, A FALL RESTRAINT SYSTEM IS REQUIRED ON EACH POLE.

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Drawing Scale: 1" = 30"

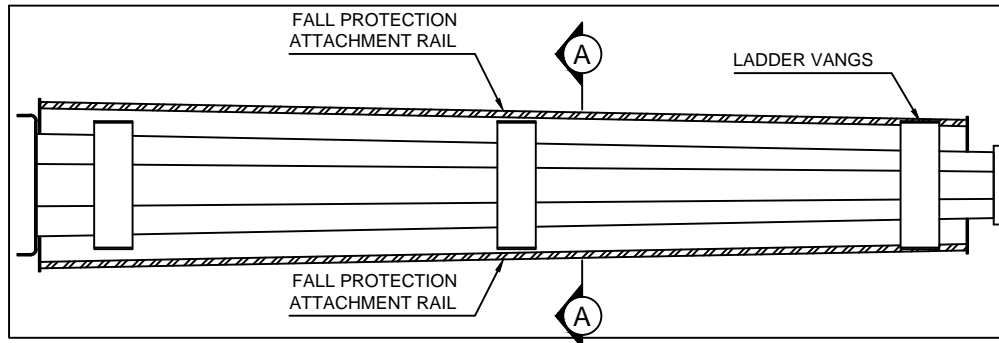


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STANDARDS  
MANUAL**

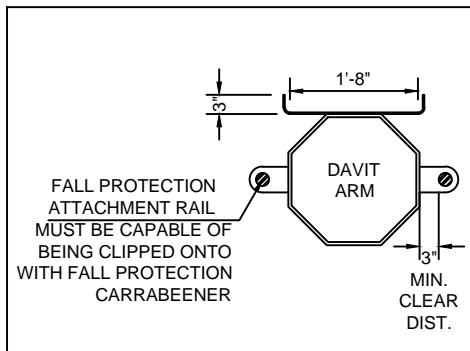
**STRUCTURE STANDARDS - STEEL  
FALL PROTECTION SYSTEMS  
FOR STEEL STRUCTURES**

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Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:	<b>TM2.23.TE-06-002</b>	Sheet 2
B. Franklin	2/11/2013	Becken/Hart	9/5/2013	Barry R. Hart	4/09/2015		



TOP VIEW OF DAVIT ARM  
NOTE A



Section 'A-A'  
DAVIT ARM LADDER VANGS  
AND FALL PROTECTION RAILS

NOTE A: FALL PROTECTION ATTACHMENT RAILS AND LADDER VANGS SHALL BE DESIGNED TO WITHSTAND 5000# OF LOAD AT ANY POINT ALONG THE RAIL.

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MANUAL

STRUCTURE STANDARDS - STEEL  
FALL PROTECTION SYSTEMS  
FOR DAVIT ARMS ON STEEL STRUCTURES

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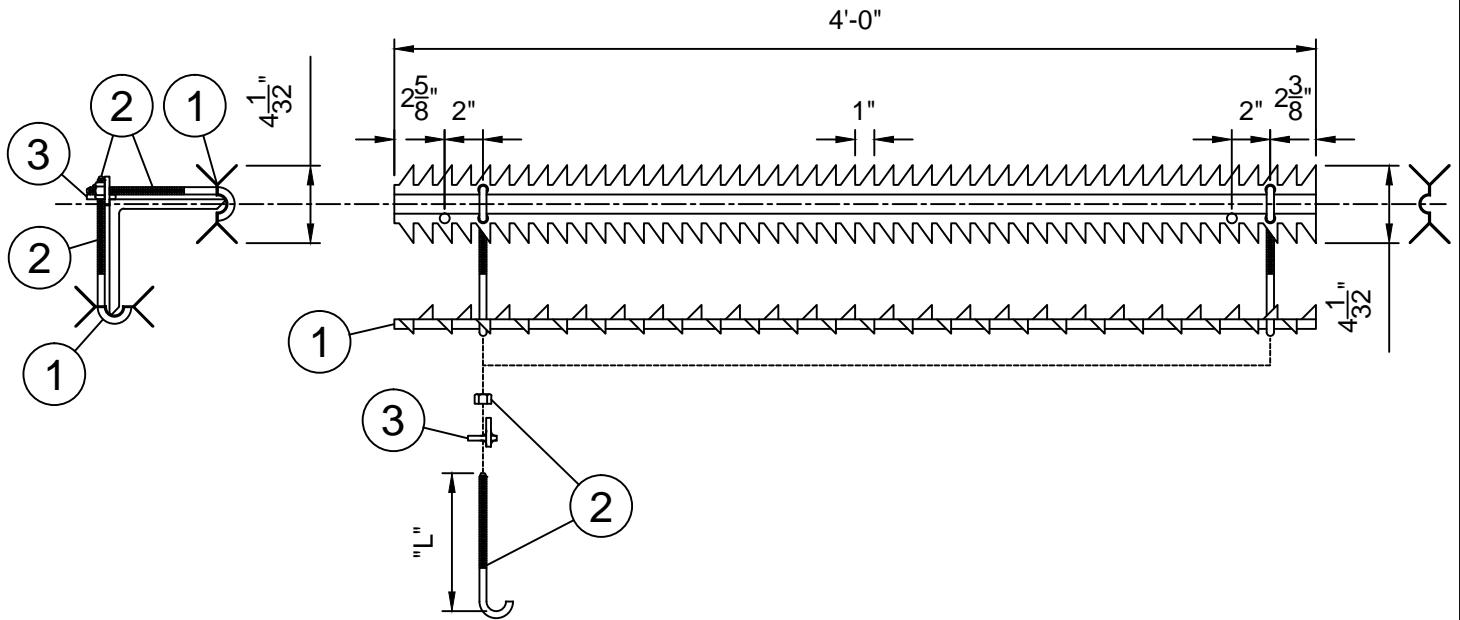
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TM2.23.TE-06-003

Sheet 1

**BILL OF MATERIAL (Type of CU: POLE)**

ITEM NO.	QTY. -A	QTY. -B	QTY. -C	UOM	IUSA MID	CU: C*PT-TE-07-001-(MARK)
1	2	2	2	EA	6000618500	ANTI-CLIMBING GUARD
2	4			EA	6000273050	J-BOLT 3/8 x 3.5 W/ HEX NUT (NOTE B)
2		4		EA	6000273060	J-BOLT 3/8 x 6.5 W/ HEX NUT (NOTE B)
2			4	EA	6000273070	J-BOLT 3/8 x 9.5 W/ HEX NUT (NOTE B)
3	2	2	2	EA	6000273000	TWISTED WASHER LINK



CU FUNCTION: TL69 FOR 35KV & 46KV, TG69 FOR 35KV 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: INSTALL ON ALL ANGLES BETWEEN 6 AND 10 FEET ABOVE THE GROUND.

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

Drawing Scale: 1" = 30"



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CONSTRUCTION  
STANDARDS  
MANUAL

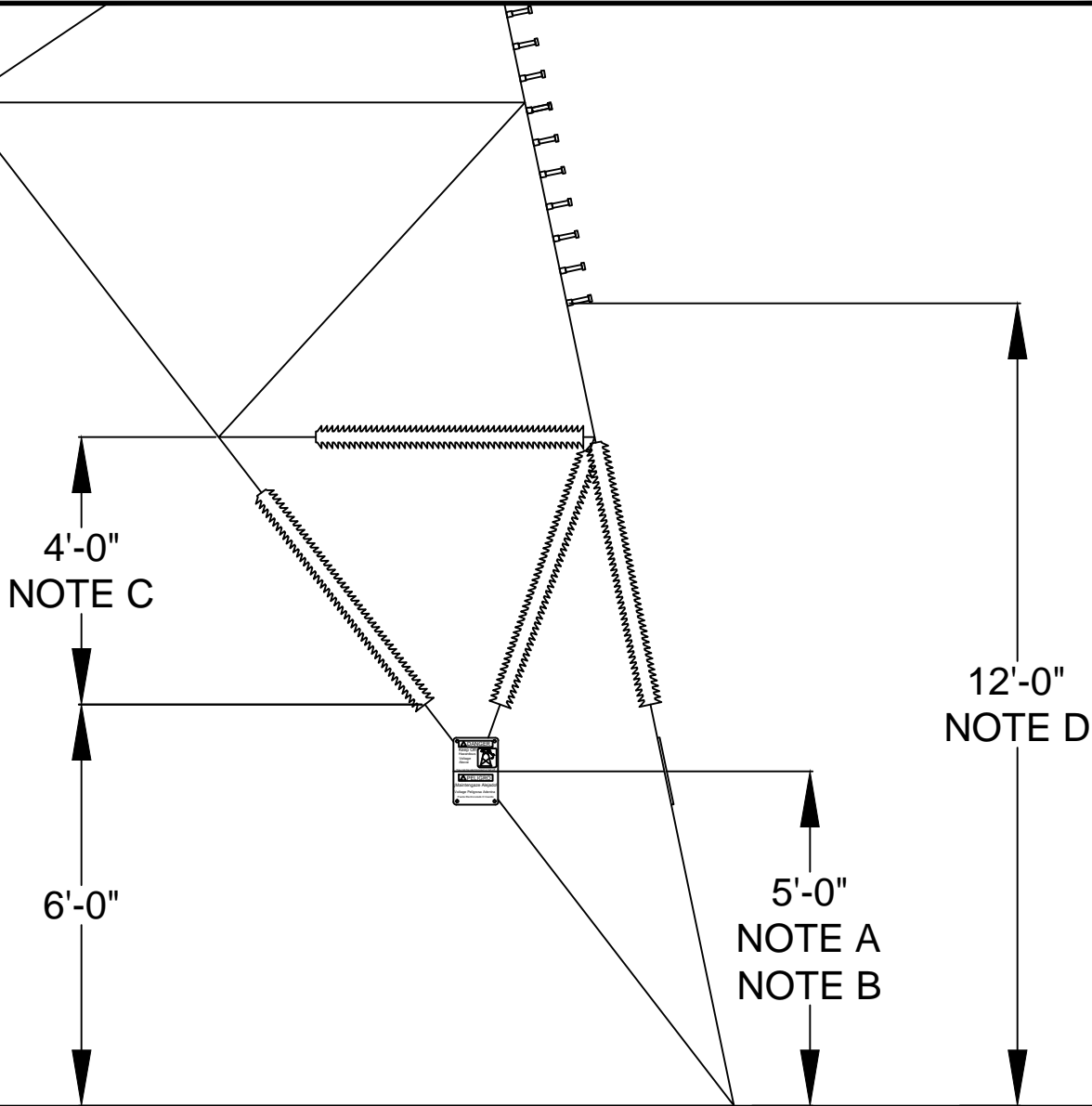
STRUCTURE STANDARDS - STEEL  
ANTI-CLIMBING DEVICES  
FOR STEEL LATTICE STRUCTURES

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**TM2.23.TE-07-001**

Sheet 1



NOTE A: INSTALL DANGER SIGNS AT APPROX. 5' ABOVE FINISHED GRADE. REFER TO STANDARD TK-07-001 FOR SIGN DETAIL.

NOTE B: FOR TOWERS WITH LEG FOUNDATION SPACINGS OF MORE THAN 12' INSTALL DANGER SIGNS ON BOTH LONGITUDINAL AND TRANSVERSE FACES OF EACH TOWER LEG PER TE-07-002. TOTAL OF 8 SIGNS PER TOWER. FOR TOWERS WITH LEG FOUNDATION SPACINGS OF LESS THAN 12' INSTALL 1 DANGER SIGN ON EACH LEG SUCH THAT THERE IS A SIGN FACING IN EACH OF THE FOUR DIRECTIONS OF THE TOWER PER TE-07-002. TOTAL OF 4 SIGNS PER TOWER.

NOTE C: INSTALL ANTI-CLIMB DEVICES ON ALL ANGLES BETWEEN 6' ABOVE GRADE AND 10' ABOVE GRADE PER TE-07-001.

NOTE D: NO LADDERS OR STEP RUNGS SHALL BE INSTALLED BELOW 12' ABOVE GRADE.

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CONSTRUCTION  
STANDARDS  
MANUAL

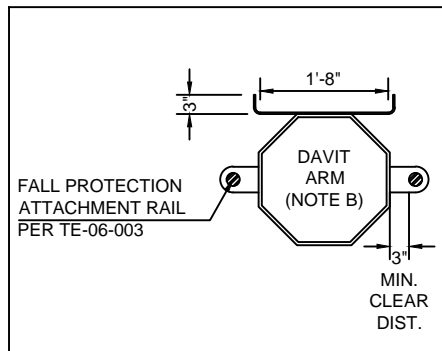
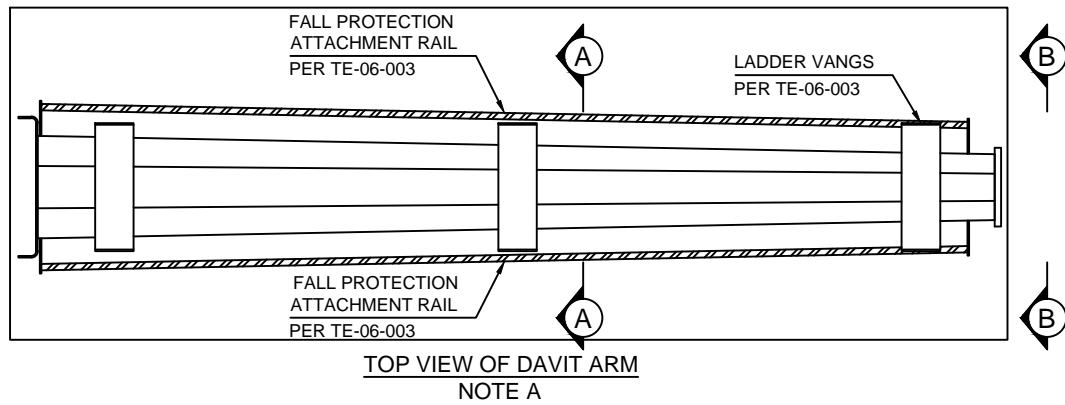
STRUCTURE STANDARDS - STEEL  
ANTI-CLIMBING MEASURES  
FOR STEEL LATTICE STRUCTURES  
APPLICATION

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DATE
5/21/2015

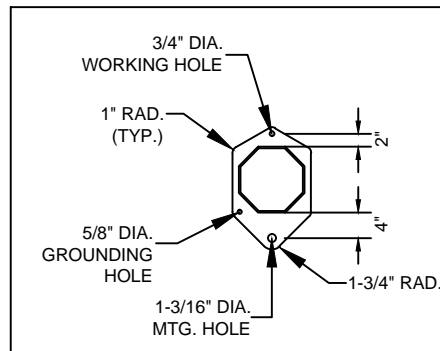
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B. Franklin	12/13/2013	Becken/Hart	3/05/2015	Barry R. Hart	4/09/2015

TM2.23.TE-07-002

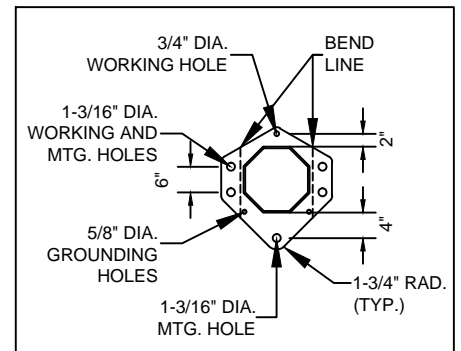
Sheet 1



Section 'A-A'  
DAVIT ARM LADDER VANGS  
AND FALL PROTECTION RAILS



Section 'B-B'  
TYPICAL DAVIT ARM END PLATE  
TANGENT APPLICATIONS  
(NOTE C)



Section 'B-B'  
TYPICAL DAVIT ARM END PLATE  
DEADEND APPLICATIONS  
(NOTE C)

NOTE A: ALL STEEL ARMS SHALL BE OUTFITTED WITH FALL PROTECTION DEVICES PER TE-06-003.

NOTE B: STEEL ARMS SHALL BE HEXAGONAL OR OCTAGONAL IN CROSS-SECTION. THIS DECISION SHALL BE MADE BY THE STEEL POLE VENDOR.

NOTE C: CONDUCTOR ATTACHMENT VANGS SHALL NOT EXCEED 3/4" THICK.

NOTE D: BENT PLATE STEEL FOR ARMS SHALL NOT BE LESS THAN 1/4" THICK.

NOTE E: STEEL ARMS SHALL BE DESIGNED SUCH THAT THEY ARE STRAIGHT WITH THE CONDUCTORS INSTALLED AND AMBIENT CONDITIONS ARE 60°F, NO WIND, NO ICE.

NOTE F: STEEL VENDOR SHALL PROVIDE A RECOMMENDATION CONCERNING INSTALLATION OF ARMS TO PREVENT DAMAGE TO DUE TO WIND-INDUCED VIBRATIONS PRIOR TO INSTALLATION OF CONDUCTORS. THIS RECOMMENDATION SHALL BE A TIE-DOWN PLAN, A WEIGHT TO SUSPEND FROM THE END OF THE ARM OR A MAXIMUM TIME THAT THE ARM MAY BE INSTALLED PRIOR TO THE INSTALLATION OF CONDUCTORS OR OTHER MITIGATION DEVICES.

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STRUCTURE STANDARDS - STEEL  
STEEL ARMS FOR STEEL STRUCTURES

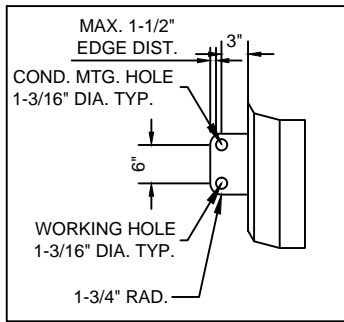
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5/21/2015

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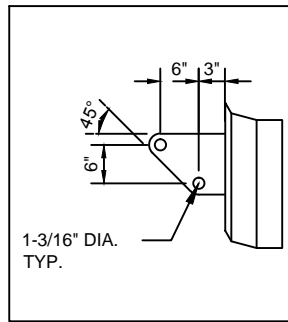
TM2.23.TE-08-001

Sheet 1

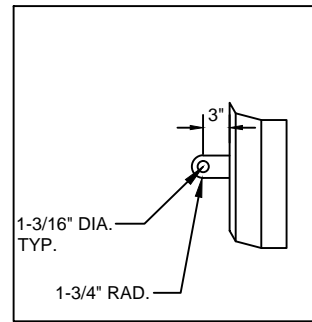




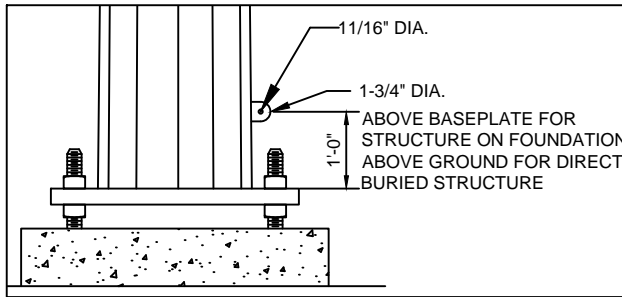
POLE MOUNTED  
DEAD END CONDUCTOR VANG



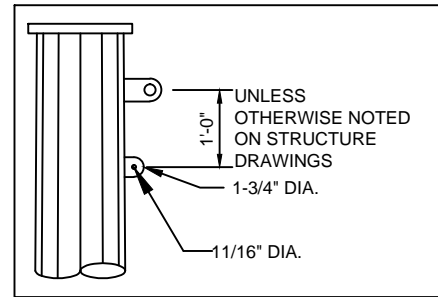
POLE MOUNTED  
GUYING VANG



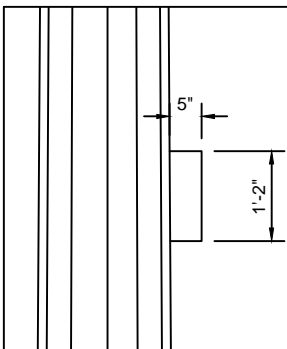
SINGLE HOLE DEAD END  
VANG



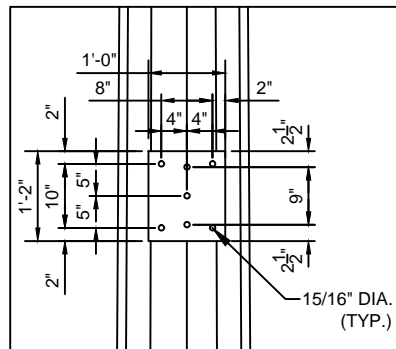
GROUNDING VANG AT STRUCTURE BASE  
STAINLESS STEEL



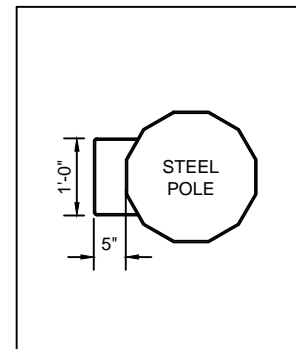
GROUNDING VANG AT STRUCTURE TOP  
STAINLESS STEEL



SIDE VIEW  
POST INSULATOR  
BASE MOUNTING



FRONT VIEW  
POST INSULATOR  
BASE MOUNTING



PLAN VIEW  
POST INSULATOR  
BASE MOUNTING

NOTE A: MAXIMUM VANG PLATE THICKNESS SHALL NOT BE GREATER THAN 3/4"

NOTE B: MINIMUM THICKNESS FOR BOXES AND VANGS SHALL BE NO LESS THAN 1/2".

NOTE C: RADII OF VANGS SHOWN IS A MINIMUM. IF THE STEEL POLE VENDOR DEEMS THAT THE SHOWN EDGE DISTANCE IS INSUFFICIENT THE STEEL POLE VENDOR MAY INCREASE THE RADIUS OF THE VANG AS LONG AS THE EDGE DISTANCE OF THE VENDORS DESIGN DOES NOT EXCEED 1-1/2".

NOTE D: ATTACHMENTS TO THE STRUCTURE SHALL BE DESIGNED AND DETAILED BY THE STEEL POLE MANUFACTURER.

NOTE E: ALL GROUNDING VANGS SHALL BE STAINLESS STEEL.

NOTE F: ALL WELDS SHALL BE PER IBERDROLA USA STEEL POLE SPECIFICATION TM2.22.01.

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STANDARDS  
MANUAL

STRUCTURE STANDARDS - STEEL  
VANGS AND BOXES

REVISION
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DATE
5/21/2015

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B. Franklin	9/08/2014	Becken/Hart	3/05/2015	Barry R. Hart	4/09/2015

TM2.23.TE-09-001

Sheet 1

CU Type: UC\_STRU

CUs limited to 17 characters

Transmission Steel Lattice Towers 'TE' CU Coding Format and Naming Convention

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th
U	X1	P	T	-	T	E	-	L	X2	X3	X4	X5			X6	

X1	OpCo
2	NYSEG
3	CMP
4	RG&E

X2	Voltage
1	115kV
2	230kV
3	345kV
4	46kV
5	35kV
6	69kV
9	multiple

X3	TYPE
D	Delta Lattice Tower
F	Flat Lattice Tower
X	Tower Body Extension 1
Y	Tower Body Extension 2
Z	Tower Body Extension 3
L	Tower Leg Extension

X4	CONFIGURATION
A	Tangent Suspension
B	Tangent Dead End
C	Vee-String Suspension
D	Angle Suspension
E	Angle Dead End
F	
Z	not applicable

X5	Structure height - foot dimension
xxx	Use 3 digits to represent the foot height of the pole. EXAMPLE: 30' = 030 150' = 150

X6	Structure height - inch dimension
xx	Use 2 digits to represent the additional inches of the pole height. EXAMPLE: 0" = 00 6" = 06 10" = 10

EXAMPLE CU:

C5PT-TE-L3DE06500  
represents a 345kV 65' delta steel lattice dead end tower

C5PT-TE-L3XE03000  
represents a 20' body extension 345kV steel lattice dead end tower


C5PT-TE-L3LE03000  
represents a 20' leg extension 345kV steel lattice dead end tower

CU Function: U\_TL69 for 35kV & 46kV, U\_TG69 for 69kV through 344kV,  
U\_T345 for 345kV & greater.

For correct CU: substitute 2 for NYSEG, 3 for CMP or 4 for RG&E in place of asterisk (U\*\_).

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

Drawing Scale: N/A

	IBERDROLA USA TRANSMISSION CONSTRUCTION STANDARDS MANUAL		TRANSMISSION STEEL STRUCTURES STANDARD CU FORMAT AND NAMING CONVENTION STEEL LATTICE TOWER STRUCTURES				Revision
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DATE		DATE		DATE		/ / 2014	
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:	TM2.23.TE-CU-L	
L.A. Best	1/22/2014	Shepard/Becken/Hart	/ / 2014	Barry R. Hart	/ / 2014	Sheet 1	

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ANSIA 8-1/2" X 11"

CU Type: UC\_POLE

CUs limited to 17 characters

Transmission Steel Pole 'TE' CU Coding Format and Naming Convention

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th
U	X1	P	T	-	T	E	-	S	X2	X3	X4	X5			X6	

X1	OpCo
2	NYSEG
3	CMP
4	RG&E

X2	Voltage
1	115kV
2	230kV
3	345kV
4	46kV
5	35kV
6	69kV
9	multiple

X3	TYPE
A	Single Pole Direct Embed Steel
B	2 Pole Direct Embed Steel
C	2 Pole Direct Embed Steel H-Frame
D	3 Pole Direct Embed Steel
E	4 Pole Direct Embed Steel
F	Single Pole Steel with Foundation
G	2 Pole Steel with Foundation
H	3 Pole Steel with Foundation
I	4 Pole Steel with Foundation
J	

X5	Structure height - foot dimension
xxx	Use 3 digits to represent the foot height of the pole. EXAMPLE: 30' = 030 150' = 150

X4	CONFIGURATION
A	Tangent Suspension
B	Tangent on Posts
C	Tangent Dead End
D	Vee-String Suspension
E	Post Angle
F	Angle Suspension
G	Angle Dead End
H	Terminal Structure
I	Switch Structure
J	
K	
L	

X6	Structure height - inch dimension
xx	Use 2 digits to represent the additional inches of the pole height. EXAMPLE: 0" = 00 6" = 06 10" = 10

EXAMPLE CU:  
C5PT-TE-S1FH03009  
represents a 115kV  
single 30'-9" steel  
terminal pole  
with a foundation.

Height of a direct embed steel pole is the total length of the pole including the embedment depth which would be listed on the plan and profile.


Height of a steel pole on a foundation is the length from the top of the pole to the bottom of the base plate.

CU Function: U\_TL69 for 35kV & 46kV, U\_TG69 for 69kV through 344kV,  
U\_T345 for 345kV & greater.

For correct CU: substitute 2 for NYSEG, 3 for CMP or 4 for RG&E in place of asterisk (U\*\_).

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

Drawing Scale: N/A

	IBERDROLA USA TRANSMISSION CONSTRUCTION STANDARDS MANUAL	TRANSMISSION STEEL STRUCTURES STANDARD CU FORMAT AND NAMING CONVENTION STEEL POLE STRUCTURES				Revision
						00
					DATE	
					/ /2014	
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:	TM2.23.TE-CU-S
L.A. Best	1/22/2014	Shepard/Becken/Hart	/ /2014	Barry R. Hart	/ /2014	
						Sheet 1

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

ANSIA 8-1/2" X 11"