

SECTION D - POLE SETTING & GUYING

Note: Updated or new standards are de-noted with RED text in the table of content.

D-2.0.0	POLE SETTING, GUYING AND BRACING
D-3.0.0	POLE SETTING DEPTHS AND SOIL CONDITIONS
D-3.0.1	POLE SETTING SPECIFICATIONS FOR DISTRIBUTION CONCRETE POLES
D-3.1.0	BOG SHOES, CRIB BRACE AND KEYS
D-4.0.1	ANCHOR INSTALLATION
D-4.0.2	ANCHOR INSTALLATION
D-5.0.0	OVERHEAD DISTRIBUTION CONDUCTOR DEADEND GUYING TENSIONS
D-5.0.1	OVERHEAD DISTRIBUTION DEADEND GUYING TENSIONS FOR HENDRIX AERIAL SPACER CABLE SYSTEM
D-6.0.0	DEADEND GUYING
D-6.0.1	ANGLE GUYING
D-7.0.0	METHODS OF ATTACHING GUYS FOR WOOD AND CONCRETE POLES
D-7.0.1	METHODS OF ATTACHING GUYS FOR WOOD OR CONCRETE POLES
D-8.0.0	DEADEND OR CORNER GUYING CROSSARM CONSTRUCTION
D-9.0.0	DEADEND GUYING VERTICAL CONSTRUCTION
D-10.0.0	ANGLE & CORNER GUYING CROSSARM & VERTICAL CONSTRUCTION
D-11.0.0	INSTALLATION OF SIDEWALK GUY & PUSH BRACE
D-12.0.0	POLE STUBBING
D-13.0.0	STORM GUYING
D-15.0.1	STAKING INFORMATION (EXHIBIT "A")
D-15.0.2	STAKING INFORMATION (EXHIBIT "A")
D-15.0.3	STAKING INFORMATION (EXHIBIT "A")
D-15.0.4	STAKING INFORMATION

THE DRAWINGS CONTAINED IN SECTION D SHOW DATA REFERRING TO THE SETTING, GUYING AND BRACING OF POLES. THE METHODS AND DATA GIVEN SHOULD BE ADHERED TO AS CLOSELY AS FIELD CONDITIONS PERMIT IN THE INTEREST OF UNIFORM CONSTRUCTION AND THE DEVELOPMENT OF MAXIMUM STRENGTH OF SUPPORTING STRUCTURES.

POLE SETTING

REFER TO STANDARD D-15 FOR INFORMATION AND DATA ON POLE AND ANCHOR STAKING.

POLES SHALL BE LOCATED IN ALIGNMENT AND SHALL BE SET TO STAND VERTICAL WHEN THE LINE IS COMPLETED. POLES LOCATED AT ANGLES, TERMINALS, CROSSINGS, OR POINTS OF EXCESSIVE STRAIN SHOULD BE CAREFULLY SELECTED FOR MAXIMUM STRENGTH.

WOOD POLES WHICH HAVE DECAYED AT THE GROUND LINE, BEYOND A POINT WHERE THEY MAY NO LONGER BE RELIED UPON AS AN ADEQUATE SUPPORT, MAY BE SPLINTED WHERE PRACTICABLE IF THEIR UPPER PORTION IS IN GOOD CONDITION AND IF SPLINTING IS NOT OBJECTIONABLE FROM THE STANDPOINT OF APPEARANCE OR OTHER REASON. AS AN EMERGENCY MEASURE, A POLE MAY BE STUBBED INSTEAD OF SPLINTED. CONCRETE POLES ARE NEVER SPLINTED EXCEPT IN EMERGENCIES.

GUYING

GUY ANCHORS SHALL, WHERE POSSIBLE, BE SO LOCATED THAT THE HORIZONTAL DISTANCE MEASURED FROM THE POLE AT THE GROUND LINE TO THE GUY ANCHOR WILL BE EQUAL TO THE HEIGHT ABOVE GROUND AT WHICH THE GUY IS ATTACHED TO THE POLE. GUYS SHALL BE ATTACHED TO THE POLES IN SUCH A MANNER AS TO INTERFERE AS LITTLE AS POSSIBLE WITH LINEMEN CLIMBING OR WORKING THEREON. THE GROUND END OF GUYS SHALL HAVE A GUY MARKER (GUY GUARD) INSTALLED AT ALL LOCATIONS.

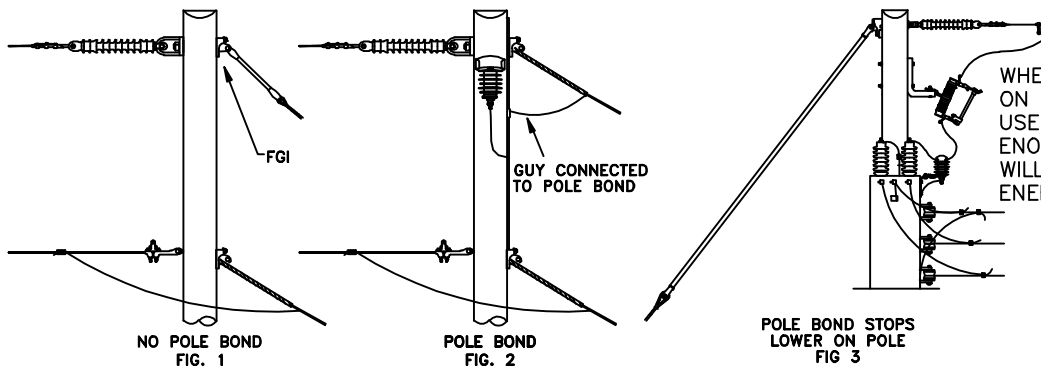
NOTE: SETTING POLES AND ANCHORS IN OR ADJACENT TO WETLANDS AREAS MAY REQUIRE ENVIRONMENTAL CONTROL MEASURES. CONTACT THE ENVIRONMENTAL SPECIALIST FOR SPECIFIC REQUIREMENTS.

GUY STRAIN INSULATORS

NESC REQUIRES THAT ALL GUYS BE EFFECTIVELY GROUNDED. EFFECTIVELY GROUNDED CAN BE ACCOMPLISHED BY CONNECTING THE GUY WIRE TO A POLE BOND WHERE THE BOND IS CONNECTED TO A DRIVEN GROUND OR CONNECTED TO THE SYSTEM NEUTRAL. GROUNDING OF THE GUY IS NOT REQUIRED IF A FIBERGLASS GUY STRAIN INSULATOR (FGI) IS INSTALLED IN A MANNER TO PREVENT ANY CONTACT BETWEEN AN ENERGIZED CONDUCTOR AND THE GUY WIRE.

APPLICATION:

GUY STRAIN INSULATORS ARE USED ON WOOD POLES WHENEVER A GUY IS INSTALLED ABOVE THE NEUTRAL FOR 13KV AND ABOVE IN NON-CONTAMINATED AREAS. UNLESS REQUIRED DUE TO REDUCED CLEARANCES, GUY STRAIN INSULATORS ARE TYPICALLY NOT REQUIRED IN CONTAMINATED AREAS OR ON CONCRETE POLES SINCE ALL THE HARDWARE INCLUDING THE GUY WIRES ARE BONDED TO THE SYSTEM NEUTRAL AND / OR A DRIVEN GROUND.



WHERE POLE BOND STOPS LOWER ON THE POLE, AN FGI SHOULD BE USED. THE FGI MUST BE LONG ENOUGH SO THAT THE METAL END WILL BE BELOW THE LAST ENERGIZED CONDUCTOR.

SFHHA 010098
FPL RC-16

GUY STRAIN INSULATORS CAN BE USED TO OBTAIN A 25% REDUCTION IN THE REQUIRED CLEARANCE BETWEEN THE GUY AND CONDUCTOR(S) WHERE NEEDED (SEE B-6, NOTE 8). ALL SLACK SPAN INSTALLATIONS ARE TO USE A GUY STRAIN INSULATOR WHERE THE SLACK CONDUCTORS ARE ADJACENT TO THE DOWNGUY. INSTALLATIONS WHERE A DOWNGUY GOES BETWEEN CONDUCTORS SHOULD ALSO USE A GUY STRAIN INSULATOR.

BONDED GUYS

WHERE THE GUY IS TO BE BONDED, ATTACH THE BOND WIRE TO THE GUY WIRE USING CONNECTOR M&S #120-44700-9. DO NOT ATTACH BOND WIRE TO PREFORMED GUY GRIP.

SUPERSEDES D-2.0.0 LAST REVISED ON 1-29-92



OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: ARR

DRAWN BY: EMR

DATE: 9-30-94

APPROVED: R.J. SALESKY

NO SCALE

DIRECTOR, DISTRIBUTION ENGINEERING AND OPERATIONS SERVICES

4	5/22/07	REVISE FIG 3 PER 2007 NESC	JNM	ELS	JJM
3	1/23/07	UPDATE NOTES	JNM	ELS	JJM
2	9/22/05	UPDATE DRAWING AND NOTES	JNM	ELS	JJM
1	8/29/03	ADD REF TO WETLANDS	JNM	ELS	JJM
0	9-30-94	REDRAWN ON CAD AND ADDED NESC REQUIREMENT	ARR	EMR	RJS
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

POLE SETTING DEPTHS

MINIMUM POLE SETTING DEPTHS IN EARTH / GOOD SOIL (FT)

POLE LENGTH	CONCRETE POLES						WOOD POLES
	TYPE "O"	SU	III G	III A	III H 8 KIP	CAST 12 KIP	WOOD
20	7						4.5
25							5
30		7.5					5.5
35	7.5	7.5	9				6
40			9	10	11.5		6.5
45			9	10	11.5	13	7
50			9.5	10	11.5	13.5	7
55			9.5		12	14	7.5
60					12	14	8
65					12	14	8.5
70						14.5	9
75						15	9.5
80						15	10

MINIMUM POLE SETTING DEPTHS IN ROCK* (FT)

POLE LENGTH	CONCRETE POLES						WOOD POLES
	TYPE "O"	SU	III G	III A	III H 8 KIP	CAST 12 KIP	WOOD
20	6						4
25							4.5
30		6					5
35	6	6	7.5				5.5
40			7.5	8	9.5		5.5
45			7.5	8.5	9.5	11	6
50			7.5	8.5	9.5	12	6
55			8		10	12	6
60					10	12	6.5
65					10	12	6.5
70						12.5	7
75						13	7.5
80						13	8

* FOR SOILS THAT ARE 90% ROCK OR HARD CLAY.

POLE SETTING DETAILS AND SOIL CONDITIONS:

FOR SOIL CONDITIONS, SEE BELOW. SEE D-3.0.1 FOR CONCRETE POLE SETTING GUIDANCE WHEN #57 ROCK IS REQUIRED.

IN SITUATIONS WHERE POLES HAVE A LARGE LOAD, IMBALANCE LOAD OR WHERE SOIL CONDITIONS ARE QUESTIONABLE, IT MAY REQUIRE ADDITIONAL CONSIDERATIONS, IN MOST CASES, ALL THAT MAY BE REQUIRED IS TO INCREASE THE BEARING SURFACE BELOW GRADE. THIS CAN BE ARCHIVED IN A NUMBER OF WAYS. THE EASIEST IS SETTING THE POLE DEEPER. ANOTHER METHOD IS TO AUGER THE SETTING HOLE, 8" TO 10" GREATER IN DIAMETER THAN THE POLE BUTT. BACKFILL WITH CONCRETE OR A FLOWABLE FILL, THIS WILL HELP MEET THE STRENGTH REQUIREMENTS AND ALLOW FOR EASY REMOVAL IF DAMAGE OCCURS TO THE POLE. FLOWABLE FILL IS A LOW STRENGTH, SLURRY-LIKE MATERIAL WITH THE CONSISTENCY OF PANCAKE BATTER, WHICH ARRIVES ON THE JOB SITE IN A READY MIX TRUCK. THE MATERIAL IS SELF-LEVELING AND REACHES 95 PERCENT OR MORE COMPACTION WITHIN A FEW HOURS OF PLACEMENT. IT GENERALLY IS MADE FROM A BLEND OF CEMENT, FLY ASH, SAND AND WATER.

IF FIELD CONDITIONS DICTATE THE NEED TO MAINTAIN THE WALLS OF AN AUGURED HOLE, USE A SOIL STABILIZER, M&S #522-125-575. A SODA ASH COMPOUND M&S #522-126-571 MAY BE NEEDED IN CONJUNCTION WITH THIS SOIL STABILIZER.

FOR LEANING POLES IN AREAS WITH NO STANDING WATER, A POLE SETTING FOAM IS AVAILABLE, M&S #522-100-000. IT EXPANDS TO FILL THE PERIPHERAL VOID BETWEEN THE POLE AND THE HOLE.

GENERAL GUIDELINES FOR TYPICAL SOILS:

GOOD SOIL

COMPACT WELL GRADED SAND AND GRAVEL, HARD CLAY OR WELL GRADED FINE AND COARSE SAND AND NO STANDING WATER.

MEDIUM SOIL

COMPACT FINE SAND AND CLAY, COMPACT SANDY LOAM, LOOSE COARSE SAND AND GRAVEL AND NO STANDING WATER. BACKFILL WITH ROCK, A 57 STONE OR SMALLER AND TAMPING EACH LAYER VERY WELL. SEE D-3.0.1 FOR INSTRUCTIONS.

POOR SOIL

SOFT CLAY, CLAY LOAM, POORLY COMPACTED SAND OR CLAYS CONTAINING LARGE AMOUNTS OF SILTS, STANDING WATER DURING WET SEASON. MAY REQUIRE BACKFILLING THE HOLE WITH CONCRETE OR A FLOWABLE FILL.

SFHHA 010099
FPL RC-16



F P L

OH & UG DISTRIBUTION SYSTEM STANDARDS

NO.	DATE	REVISION	ORIG.	DRAWN	APPR.
5	6/16/15	UPDATE NOTES	DJY	ELS	RDH
4	4/21/15	UPDATE CHARTS	DJY	ELS	RDH
3	4/23/14	UPDATE CHARTS	DJY	ELS	RDH
2	8/12/11	UPDATE TABLES	ARR	ELS	BXN
1	6/6/06	NEW DRAWING	RJO	ELS	JJM.

ORIGINATOR: A.A.

DRAWN BY: J.H.

DATE: 7-1-87

APPROVED: R. K. CIELO
DIRECTOR, DISTRIBUTION ENGINEERING AND SERVICE PLANNING

NO SCALE

NOTES:

- A. THE BACKFILL MATERIAL (ASTM C-33 TABLE 1 SIZE 57 GRAVEL) SHALL BE PLACED GRADUALLY IN THE HOLE STARTING AT THE BOTTOM OF THE HOLE. DURING BACKFILL OPERATION, COMPACTION SHALL BE ACHIEVED USING A CONCRETE PLACEMENT VIBRATOR (M&S #594-865-010).
- B. ALL POLES WILL BE SET IN A STRICT VERTICAL POSITION UNLESS OTHERWISE SPECIFIED (I.E. NO CAMBER).
- C. A TOLERANCE OF (-) 0 INCHES (+) 12 INCHES WILL BE ALLOWED FROM THE SETTING DEPTH SHOWN ON D-3.0.0 OR THE JOB PRINT.
- D. DRILLING METHODS USED DURING THE INSTALLATION OF DISTRIBUTION CONCRETE POLES SHALL ENSURE THAT ALL NATURAL SOILS ARE REMOVED (IF POSSIBLE) PRIOR TO THE INSTALLATION OF ROCK BACKFILL. SOIL STABILIZERS SHALL BE OF SUCH CONSISTENCY DURING BACKFILL AS TO NOT IMPEDE ROCK COMPACTION AT THE BOTTOM OF THE HOLE. IF POLE REQUIRES JETTING, ATTEMPT TO INSTALL AS MUCH ROCK AS POSSIBLE IN THE POLE HOLE.
- E. USE AN AUGER THAT IS 12"-18" GREATER THAN THE BUTT OF THE POLE FOR DRILLING POLE HOLES.
- F. POLES INSTALLED IN ROCK DO NOT REQUIRE #57 ROCK BACKFILL.

ASTM C-33 TABLE 1, SIZE 57 CAN BE OBTAINED FROM CONCRETE COMPANY

PLACE BACKFILL GRADUALLY IN HOLE STARTING AT THE BOTTOM OF THE HOLE. USE CONCRETE PLACEMENT VIBRATOR DURING ENTIRE BACKFILL OPERATION.

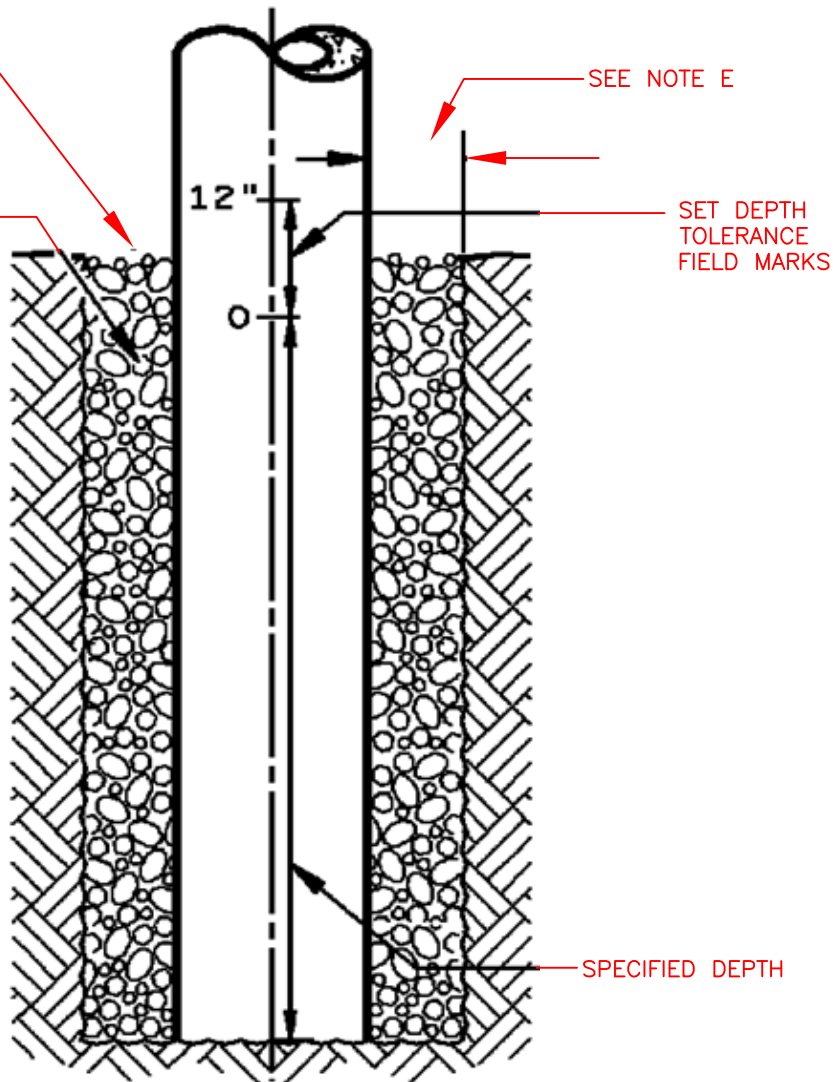


FIGURE 1

SFHHA 010100
FPL RC-16



OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: D. YOUNG

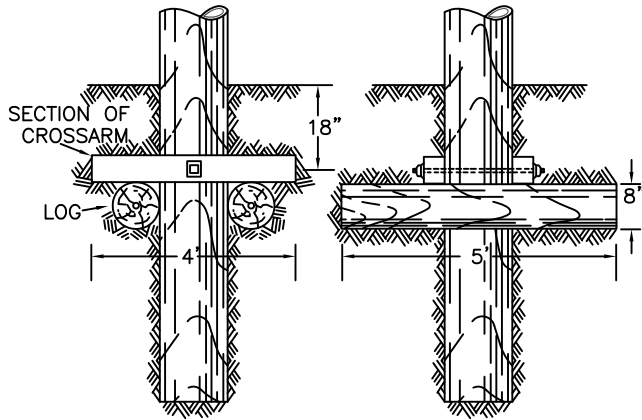
DRAWN BY: ELS

DATE: 5/27/15

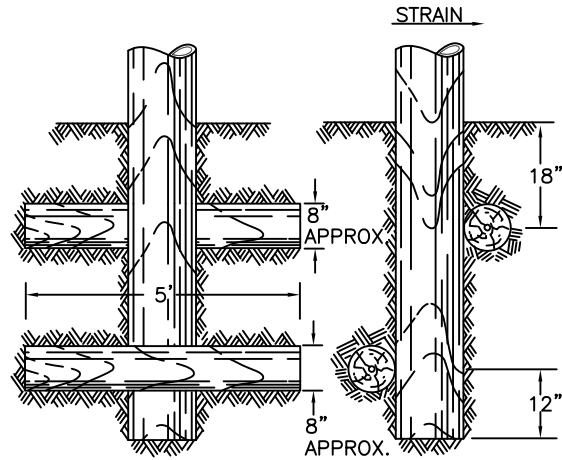
APPROVED: RICK HUFF
MANAGER OF ELECTRICAL STANDARDS

NO SCALE

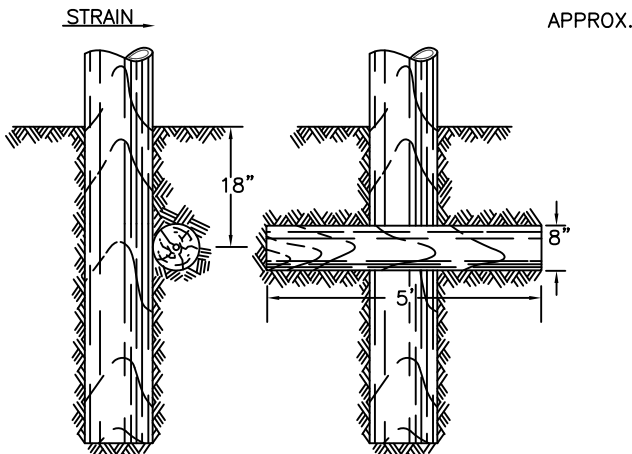
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.



TO SUPPORT POLES IN MUCK OR QUICKSAND
BOG SHOE
 FIG. 2



TO BRACE POLE AGAINST LIGHT STRAINS IN
 MUCK OR QUICKSAND
CRIB BRACE
 FIG. 3



TO BRACE POLE AGAINST LIGHT STRAINS
 IN LOOSE SOILS
POLE KEY
 FIG. 4

NOTE:
 LOGS IN THE BOG SHOE FIG. 2 SHOULD BE INSTALLED
 AT RIGHT ANGLES TO LINE AND MAY BE INCREASED IN
 LENGTH OR BOLTED TO POLE, IF REQUIRED BY FIELD
 CONDITIONS.

SFHHA 010101
 FPL RC-16



OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: RJO

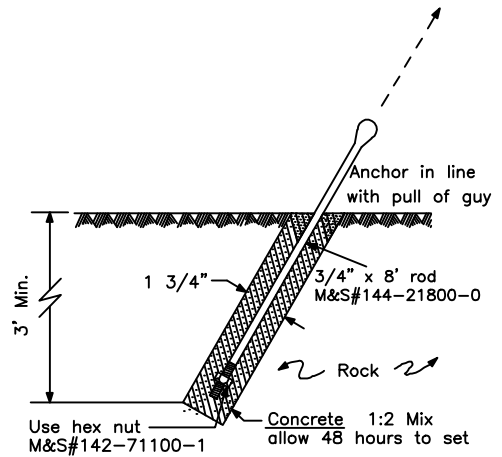
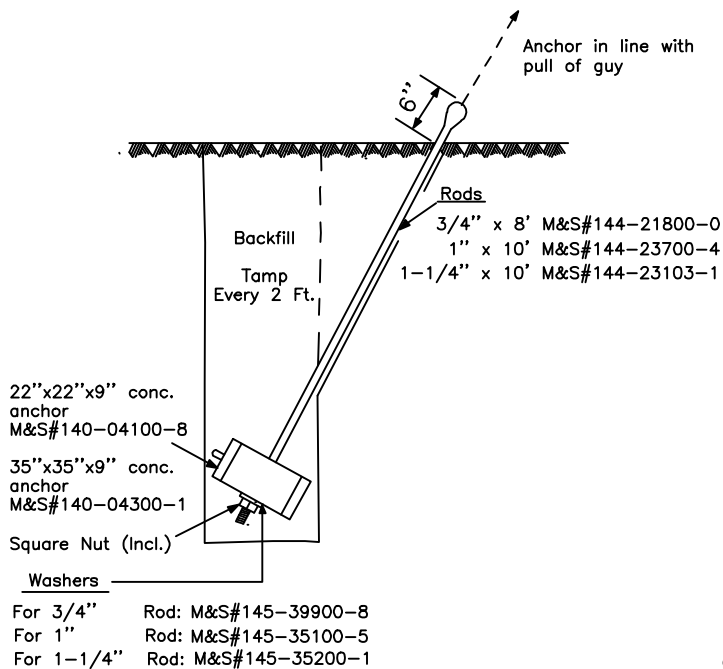
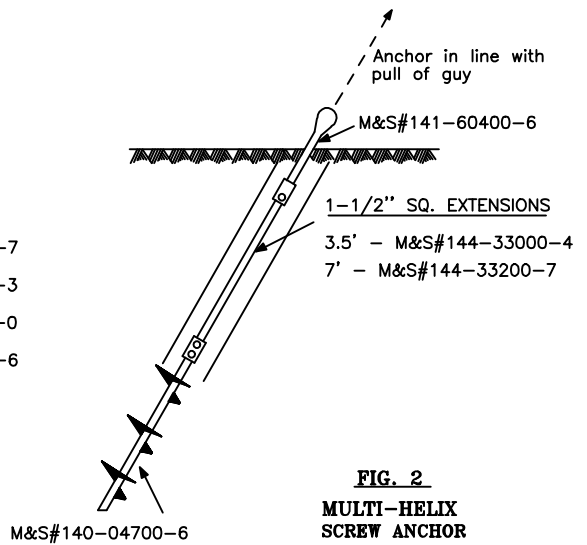
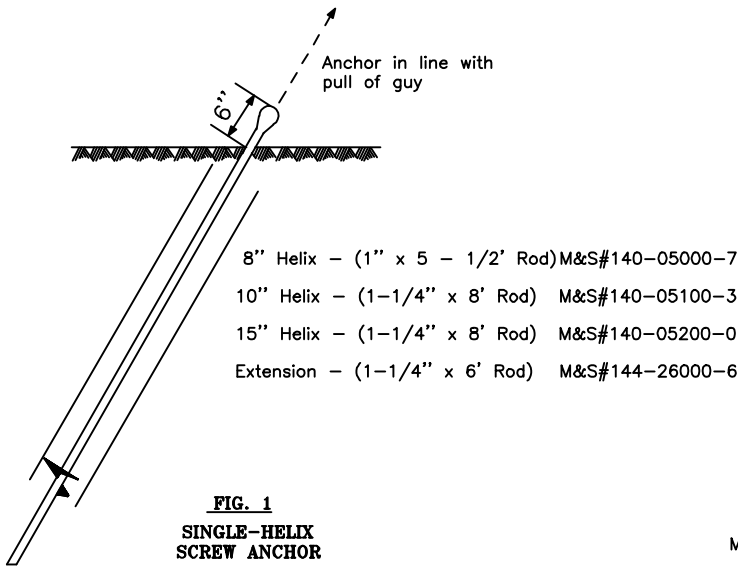
DRAWN BY: ELS

DATE: 6/6/06

APPROVED: J.J. McEVOY
 SUPERVISOR, OH/UG PRODUCT
 SUPPORT SERVICES

NO SCALE

NO.	DATE	REVISION	ORIG.	DRAWN	APPR.
2	6/16/15	RENAME DWG FROM D-3.0.1 TO D-3.1.0	DGY	ELS	RDH
1	6/6/06	REVISE DRAWING THROUGH OUT	RJO	ELS	JJM



SFHHA 010102
 FPL RC-16

FIG. 4
ROCK ANCHOR

SUPERSEDES D-4 LAST REVISED 3-1-89



OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: A.A.

DRAWN BY: J.R.F.

DATE: 1-1-90

APPROVED: R. K. CIELO
 DIRECTOR, DISTRIBUTION ENGINEERING
 AND SERVICE PLANNING

NO SCALE

NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

FIGURE	ANCHOR SIZE	ALLOWABLE HOLDING CAPACITY (IN POUNDS) (A,F)					
		DEADEND GUYING			TRANSVERSE GUYING		
		POOR SOIL (B)	GOOD SOIL (C)	TORQUE METHOD (D)	POOR SOIL (B)	GOOD SOIL (C)	TORQUE METHOD (D)
1(H)	8"	4800	12100	9000	3200	8000	6000
	10"	6000	13300	9600	4000	8800	6400
	15"	9600	16900	11200	6400	11200	7400
2(E,H)	10-11 $\frac{5}{16}$ " - 13 $\frac{1}{2}$ "	18100	33900	26000	12000	22400	17200
3	22" W/ 3/4" x 8' ROD	10900		-	7200		-
	22" W/ 1" x 10' ROD	10900		-	7200		-
	35" W/ 3/4" x 8' ROD	13900		-	9200		-
	35" W/ 1" x 10' ROD	21800		-	14400		-
	35" W/ 1-1/4" x 10' ROD	24200		-	16000		-
4(G)	ROCK W/ 3/4" x 8' ROD	13900		-	9200		-

NOTES:

- (A) VALUES SHOWN ARE APPROXIMATE MECHANICAL STRENGTHS WHICH INCLUDE SAFETY FACTORS.
- (B) POOR SOIL INCLUDES: LOOSE SAND, MEDIUM-STIFF CLAY, LOAM, FILL, SILT.
- (C) GOOD SOIL INCLUDES: COMPACTED CLAY AND GRAVEL, HARDPAN, CLAYPAN, COMPACTED SAND.
- (D) TORQUE METHOD: AN AVERAGE TORQUE OF 4000 FT-LBS FOR MULTI-HELIX (2000 FT-LBS FOR SINGLE HELIX) MUST BE DEVELOPED CONTINUOUSLY FOR AT LEAST THE LAST 5 FEET (3 FEET FOR SINGLE HELIX) OF INSTALLATION.
- (E) VALUES SHOWN FOR MULTI-HELIX ANCHOR ARE VALID WHEN USED WITH AT LEAST A 7 FOOT EXTENSION.
- (F) ACTUAL HOLDING CAPABILITIES COULD BE LESS AS DETERMINED BY LOCAL SOIL CONDITIONS.
- (G) VALUES SHOWN FOR ROCK ANCHOR ARE VALID ONLY FOR INSTALLATIONS IN SOLID ROCK AREAS.
- (H) FOR MARSH OR SWAMP AREAS, INSTALL EXTENSIONS UNTIL REQUIRED HOLDING STRENGTH IS ACHIEVED.



SFHHA 010103
FPL RC-16

OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: A.S.

DRAWN BY: J.R.F.

1	3-15-91	REV. HOLDING CAP DATA	AS	HO	RKC
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

DATE: 1-1-90

APPROVED: R. K. CIELO
DIRECTOR, DISTRIBUTION ENGINEERING
AND SERVICE PLANNING

NO SCALE

**OVERHEAD DISTRIBUTION
CONDUCTOR DEADEND GUYING TENSIONS**

TABLE I

FULL TENSION (IN POUNDS) IN CONDUCTORS BASED ON 9 LB. PER SQ. FT. WIND AT 30' F.								
WIRE					TREE WIRE		ALL ALUMINUM 600 VOLT (4)	
CONDUCTOR SIZE	COPPER	AAAC OR ACAR	ACSR	ALL ALUM.	ALUMINUM	COPPER	ALUMINUM	TYPE
#6 SOLID OR STR.	500*						666	DPX
#4 SOLID OR STR.	730*	790	800*				932	TPX
#2, 3 STR.	1400*							
#2, 7 STR.	1080	1210*	1200*		1310	1230*	1353	TPX
#1/0, 7 STR.	1620*	1890	1600*				1517	TPX
#2/0, 7 STR.	2000							
#3/0, 7 STR.		2870	2500*				2054	TPX
#4/0, 7 STR.	3010*					2260	4100*	CABLE(3)
343.6 or 336.4 MCM		3480*	3280*	2200*			2884	QPX(5)
350 MCM	3280							
568.3 or 556.5 MCM		4820	3920*	2900*	4860		2636	QPX(5)

* CONDUCTORS NO LONGER USED FOR NEW CONSTRUCTION

TABLE II

ALLOWABLE TENSION (IN POUNDS) IN GUYS BASED ON 54.5% ULTIMATE STRENGTH FOR DEADENDS AND 36% FOR TRANSVERSE GUYS FOR GRADE B CONSTRUCTION PER NESC RULE 261C.				
SIZE AND TYPE GUY	DEADEND TENSION ALLOWABLE	TRANSVERSE TENSION ALLOWABLE	GUY HOOK REQUIRED	GUY STRAIN INSULATOR RATING
	GRADE B CONST.	GRADE B CONST.		
GALVANIZED, 5/16", 7 STR., E.H.S.	6100	4030	142-186-003	15,000 LB.
GALVANIZED, 7/16", 7 STR., E.H.S.	11340	7480	142-186-003 142-187-000	35,000 LB. SEE NOTE 7
GALVANIZED, 9/16", 19 STR., E.H.S.	18380	12130	142-187-000	35,000 LB.

NOTES:

- TABLE 1 IS BASED ON STRINGING TENSIONS PER SECTION F, WHICH IS BASED ON A RULING SPAN OF 250 FT. AND ADJUSTED FOR A WIND LOAD OF 9 POUNDS PER SQ. FT. @ 30' F.
- TO DETERMINE TENSION IN ANGLE AND DOWN GUYS, SEE D-6.0.0
- SECONDARY CABLE DEADEND AGAINST #1/0 AAAC OPEN WIRE SECONDARY SHOULD ALWAYS BE GUYED, ALTHOUGH THE ABOVE TABLES WOULD NOT INDICATE THIS NECESSITY. UNDER HEAVY TRANSVERSE WIND LOADING, THE CABLE TENSION EXCEEDS SAFE TENSIONS FOR THE OPEN WIRE.
- DPX AND TPX SECONDARY CBL'S TENSION REFERS TO NEUTRAL TENSION LIMITATIONS WITH WIND LOAD OF 9 POUNDS PER SQ. FT. @ 30' F. ACTING ON THE OVER ALL O.D. 250 FT. RULING SPAN.
- QPX SECONDARY CBL'S TENSION REFERS TO NEUTRAL TENSION LIMITATIONS WITH WIND LOAD OF 9 POUNDS PER SQ. FT. @ 30' F. ACTING ON THE OVER ALL O.D. 150 FT. RULING SPAN.
- DO NOT USE WEDGE CLAMPS (SERVICE BAILS) TO DEADEND FULL TENSION MULTIPLEX CABLE.
- IF GUY STRAIN INSULATOR IS NEEDED USE GUY HOOK M&S# 142-187-000, OTHERWISE USE M&S# 142-186-003.

SUPERSEDES D-5.0.0 LAST REVISED ON 1-29-92

**SFHHA 010104
FPL RC-16**



OH & UG DISTRIBUTION SYSTEM STANDARDS

3	9/21/05	UPDATE TABLE II AND REVISE NOTES	JNM	ELS	RJS
2	9-30-94	REVISED TABLE II - CHANGED NESC RULE #216C TO #261C.	ARR	BAQ	RJS
1	9-27-93	UPDATE TABLE II AND REVISE NOTES	ARR	AB	RJS
0	6-30-93	REDRAWN - ADDED NOTE 6	ARR	CB	RJS
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

ORIGINATOR: ARR

DRAWN BY: CB

DATE: 6-30-93

APPROVED: R. J. SALESKY
DIRECTOR, DISTRIBUTION ENGINEERING
AND OPERATIONS SERVICES

NO SCALE

OVERHEAD DISTRIBUTION
DEADEND GUYING TENSIONS FOR
HENDRIX AERIAL SPACER CABLE SYSTEM

FULL TENSION (IN POUNDS) IN 1/2" (7#6 AWA) MESSENGER USED WITH CONDUCTOR SIZES SHOWN				
	CONDUCTOR TENSION PER PHASE	MESSENGER TENSION		
		3 PHASE	2 PHASE	1 PHASE
#4/0 AAC	240	5750	4960	4070
636 KCMIL	445	7130	5970	4630
TENSION SHOWN IS BASED ON 9 POUNDS PER SQUARE FOOT WIND LOAD AT 30°F				

NOTE:

1. ADD THE CONDUCTOR TENSION TO THE MESSENGER TENSION TO DETERMINE TOTAL IN-LINE TENSION TO BE GUYED.
2. IF CONDUCTOR IS DEADENDED MORE THAN 18" BELOW THE MESSENGER, A SEPARATE GUY IS NEEDED FOR THE CONDUCTOR.

SFHHA 010105
FPL RC-16



OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: JNM

DRAWN BY: PRH

DATE: 07/28/99

APPROVED: J.J. MCEVOY
SUPERVISOR, OH/UG PRODUCT
SUPPORT SERVICES

NO SCALE

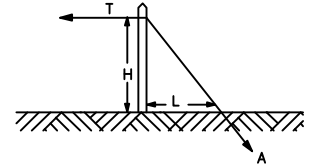
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

THE ANCHOR GUY CHART (CHART 1) CONVERTS HORIZONTAL TENSION TO DOWN-GUY TENSION.

FORMULA (CHART 1)

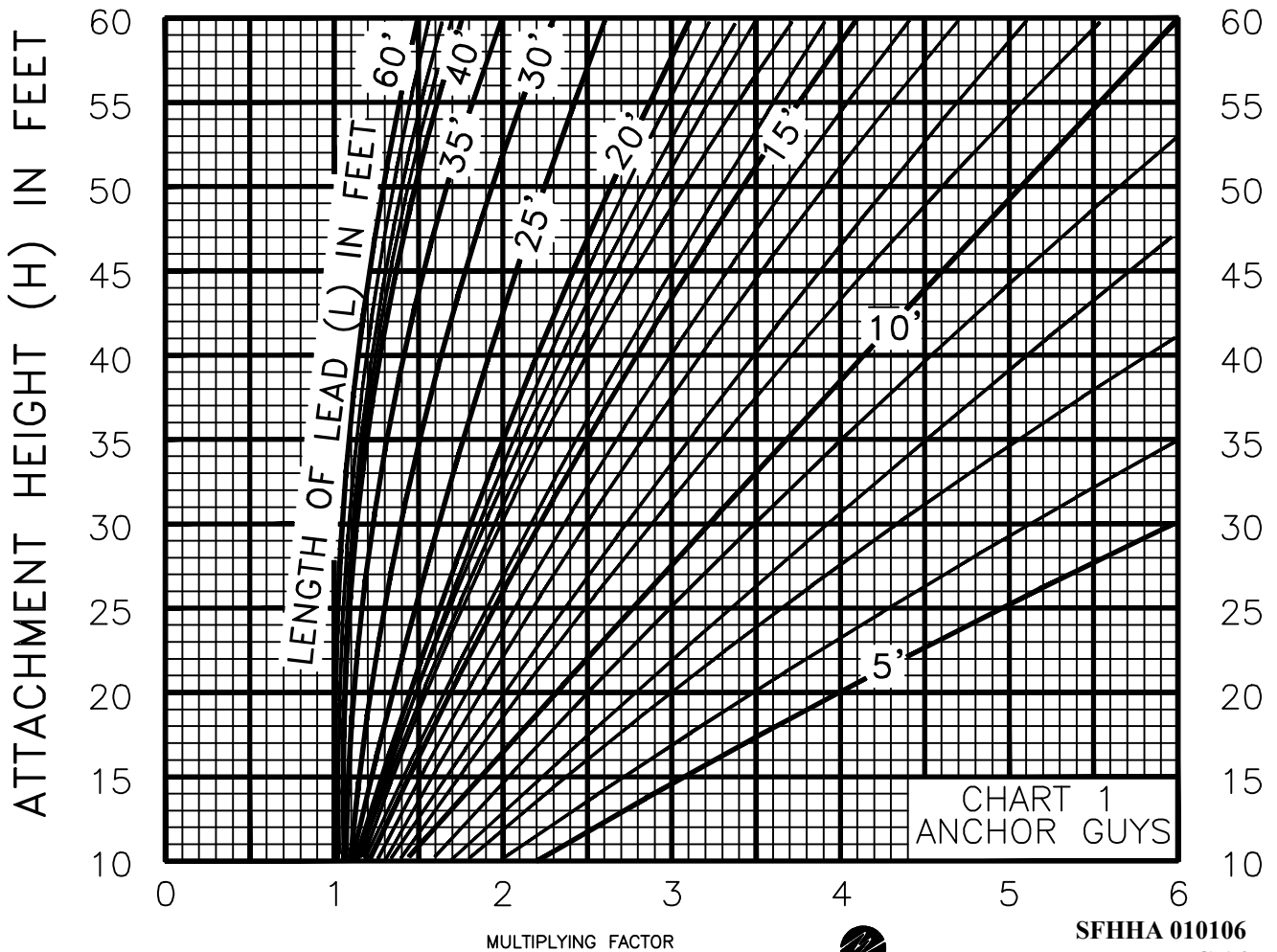
$$A = \frac{T\sqrt{H^2 + L^2}}{L}$$

- T = TENSION IN CONDUCTORS
- β = ANGLE TURNED
- S = GUY TENSION SPLITTING THE ANGLE
- K,P = SIDE TENSION PERPENDICULAR TO ONE SECTION OF POLE LINE
- N,D = IN-LINE TENSION TO HOLD UNBALANCE CAUSED BY K OR P
- H = HEIGHT OF ATTACHMENT ON POLE
- L = LENGTH OF LEAD
- A = ANCHOR GUY STRAIN



LEGEND
(SEE CHART 1)

CHART 1 - ANCHOR GUYS



SFHHA 010106
FPL RC-16

OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: AS

DRAWN BY: JRF/HO

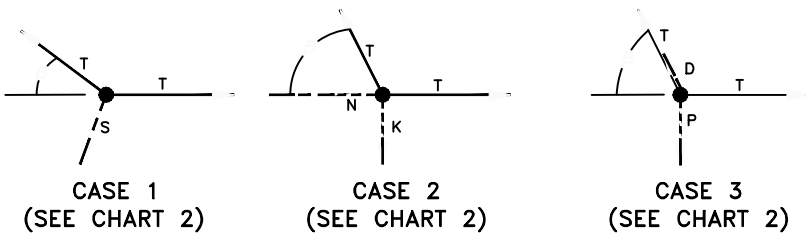
DATE: 1-1-90

APPROVED: R. K. CIELO
DIRECTOR, DISTRIBUTION ENGINEERING
AND SERVICE PLANNING

NO SCALE

NO.	DATE	REVISION	ORIG.	DRAWN	APPR.
2	9/2/03	UPDATE DRAWING & NOTES	JNM	ELS	JJM
1	6-30-93	REVISED CHART #1 IN SMALLER INCREMENTS	ARR	WAW	RJS

THE ANGLE GUYING BELOW (CHART 2) PROVIDES BOTH FOR SITUATIONS WHERE THE ANGLE CAN BE SPLIT, AND WHERE A GUY MUST BE SET AT RIGHT ANGLES TO ONE OF THE LINES.

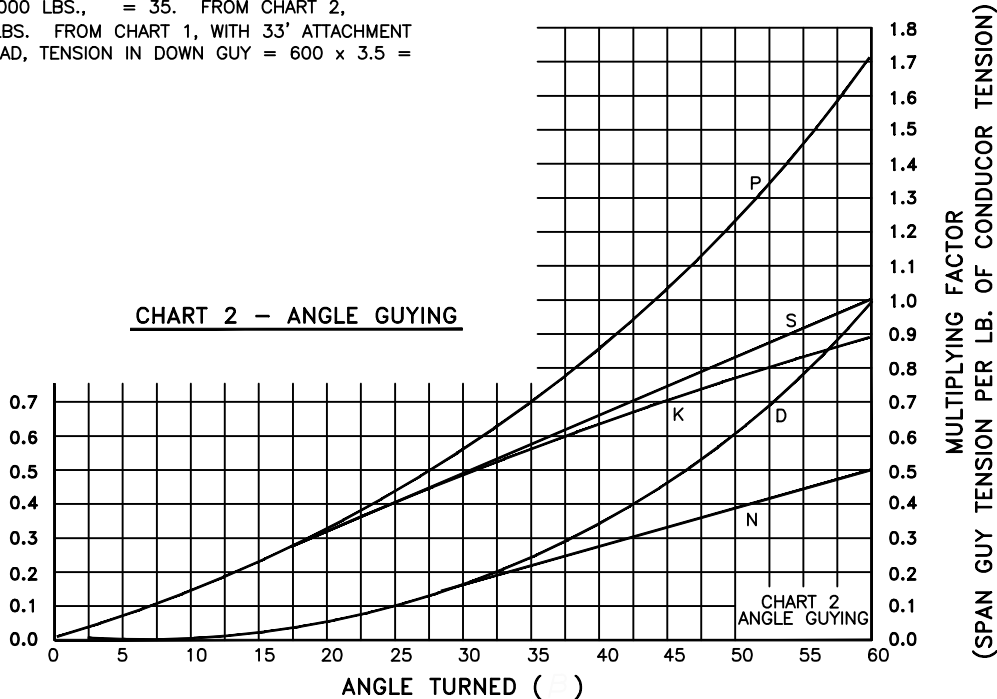


NOTES:

1. TENSIONS SHOWN ARE HORIZONTAL, AND MUST BE CONVERTED FOR ANCHOR GUYS. (SEE CHART 1)
2. ANY UNBALANCED STRAIN OF LESS THAN 200 LBS. NEED NOT TO BE GUYED,
3. SPAN GUYS MAY BE USED IF UNBALANCE (AS AT "D" IN CASE 3) IS BETWEEN 200 - 1,000 LBS.

T = TENSION IN CONDUCTORS
 P = ANGLE TURNED
 S = GUY TENSION SPLITTING THE ANGLE
 K, P = SIDE TENSION PERPENDICULAR TO ONE SECTION OF POLE LINE
 N, D = IN-LINE TENSION TO HOLD UNBALANCE CAUSED BY K OR P
 H = HEIGHT OF ATTACHMENT ON POLE
 L = LENGTH OF LEAD
 A = ANCHOR GUY STRAIN

EXAMPLE:
 SPLIT ANGLE, HOLD SIDE STRAIN WITH ANCHOR GUY. CONDUCTOR TENSION = T = 1,000 LBS., $\theta = 35^\circ$. FROM CHART 2, S = 0.6T = 600 LBS. FROM CHART 1, WITH 33' ATTACHMENT HEIGHT AND 10' LEAD, TENSION IN DOWN GUY = 600 x 3.5 = 2,100 LBS.



FORMULAS (CHART 2)

$$S = 2T(\sin \frac{1}{2} \theta) \quad N = T(1 - \cos \theta)$$

$$K = T(\sin \theta) \quad D = \frac{I(1 - \cos \theta)}{\cos \theta}$$

$$P = T(\tan \theta)$$

SFHHA 010107
 FPL RC-16



OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: JNM

DRAWN BY: ELS

NO.	DATE	REVISION	ORIG.	DRAWN	APPR.
1	12/5/13	UPDATE DRAWING	AR	ELS	WM
0	9/2/03	ORIGINAL DRAWING (MOVED FROM D-6.0.0)	JNM	ELS	JJM

DATE: 9/2/03

APPROVED: J.J. MCEVOY
 SUPERVISOR, OH/UG PRODUCT SUPPORT SERVICES

NO SCALE

HEAVY DUTY ATTACHMENT

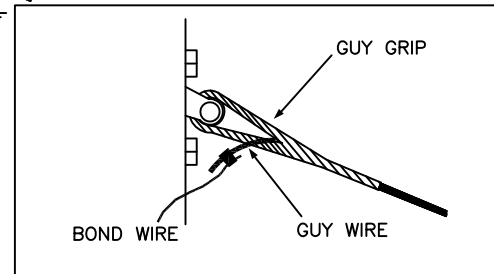
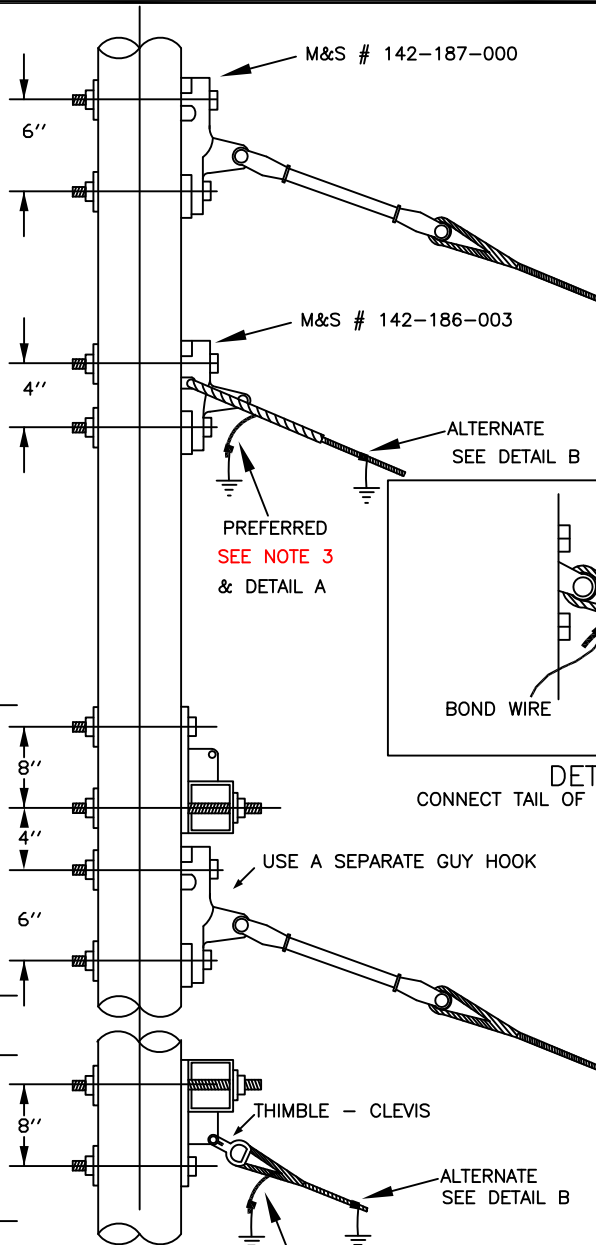
FOR GUYS TO 9/16" GALV. USE 3/4" BOLTS AND 4" SQUARE WASHERS. (CURVED WASHER ON WOOD POLES) (FLAT WASHER ON CONCRETE POLES)

USE THE HEAVY DUTY ATTACHMENT WITH 6" MOUNTING HOLES ON ALL CONCRETE POLES

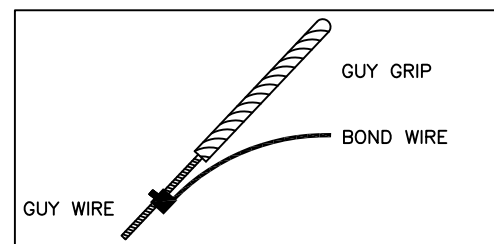
MEDIUM DUTY ATTACHMENT

FOR GUYS TO 7/16" GALV. USE 5/8" BOLTS AND 4" SQUARE WASHERS. (CURVED WASHER ON WOOD POLES) (FLAT WASHER ON CONCRETE POLES)

SYMBOL  MEANS TO POLE BOND



DETAIL A
CONNECT TAIL OF GUY WIRE TO POLE BOND



DETAIL B
CONNECT POLE BOND WIRE TO GUY WIRE BELOW GUY GRIP

WOOD POLE ARRANGEMENT

STEEL/COMPOSITE CROSSARM ATTACHMENT (SEE NOTE 1) ON CONCRETE POLE

CONCRETE POLE ARRANGEMENT

- ALL GUYS SHALL BE BONDED EXCEPT WHERE A GUY STRAIN INSULATOR IS USED. GUY STRAIN INSULATORS ARE USED ON WOOD DEADEND POLES WHENEVER A GUY IS INSTALLED ABOVE THE NEUTRAL FOR 13KV AND ABOVE IN NON-CONTAMINATED AREAS. THEY ARE NOT USED ON CONCRETE POLES AND ARE NOT REQUIRED ON WOOD DEADEND POLES (OR POLE GUYED FOR ANY REASON) IF PROTECTED BY SURGE ARRESTERS. IN CASES WHERE A DOWNGUY IS LOCATED ADJACENT TO CONDUCTORS, THE GUY SHALL EITHER USE A GUY STRAIN INSULATOR THAT IS LONG ENOUGH TO EXTEND BELOW THE LOWEST CONDUCTOR OR BE BONDED. **GUY STRAIN INSULATORS MUST EXTEND BELOW LOWEST ENERGIZED CONDUCTOR.**
- GUY STRAIN INSULATORS CAN BE USED TO OBTAIN A 25% REDUCTION IN THE REQUIRED CLEARANCE BETWEEN THE GUY AND CONDUCTOR(S) WHERE NEEDED (SEE B-6, NOTE 8). ALL SLACK SPAN INSTALLATIONS ARE TO USE A GUY STRAIN INSULATOR WHERE THE SLACK CONDUCTORS ARE ADJACENT TO THE DOWNGUY. INSTALLATIONS WHERE A DOWNGUY GOES BETWEEN CONDUCTORS SHOULD ALSO USE A GUY STRAIN INSULATOR.
- WHERE THE GUY IS TO BE BONDED, ATTACH THE BOND WIRE TO THE GUY WIRE USING CONNECTOR M&S #120-447-009. DO NOT ATTACH BOND WIRE TO PREFORMED GUY GRIP (OR ANY OTHER PART OF THE GUYING INSTALLATION).



SFHHA 010108
FPL RC-16

OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: AS

DRAWN BY: JRF

DATE: 3/01/89

APPROVED: G. W. HAMMOND III

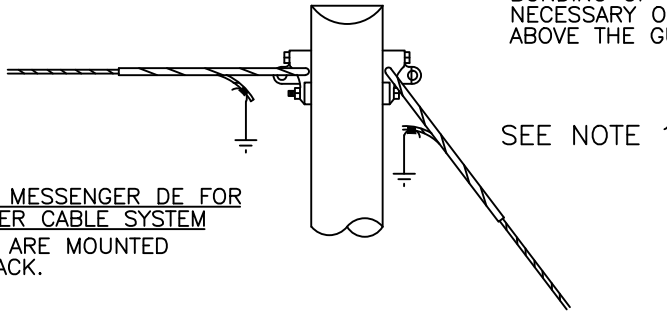
NO SCALE

DIRECTOR, DISTRIBUTION ENGINEERING AND SERVICE PLANNING

NO.	DATE	REVISION	ORIG.	DRAWN	APPR.
10	2/9/16	UPDATE DRAWING	DGY	ELS	RDH
9	12/1/15	UPDATE DRAWING	DGY	ELS	RDH
8	3/17/15	UPDATE DRAWING	DGY	ELS	RDH
7	1/16/15	UPDATE DRAWING	DGY	ELS	RDH

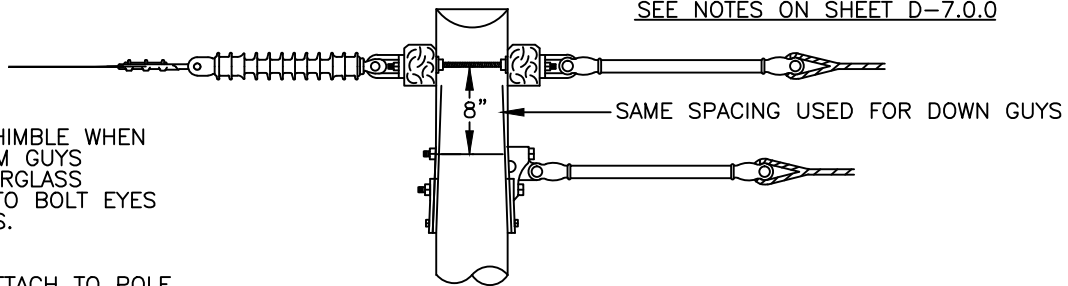
METHOD OF ATTACHING GUYS
FOR WOOD OR CONCRETE POLES

BONDING OF GUYS AT STUB POLES IS NECESSARY ONLY IF THERE ARE CIRCUITS ABOVE THE GUYS ON THE STUB POLE.



GUY STUB POLE OR MESSENGER DE FOR HENDRIX AERIAL SPACER CABLE SYSTEM
GUY ATTACHMENTS ARE MOUNTED BACK TO BACK.

FIBERGLASS STRAIN INSULATORS ARE NOT USED ON CONCRETE POLES
SEE NOTES ON SHEET D-7.0.0

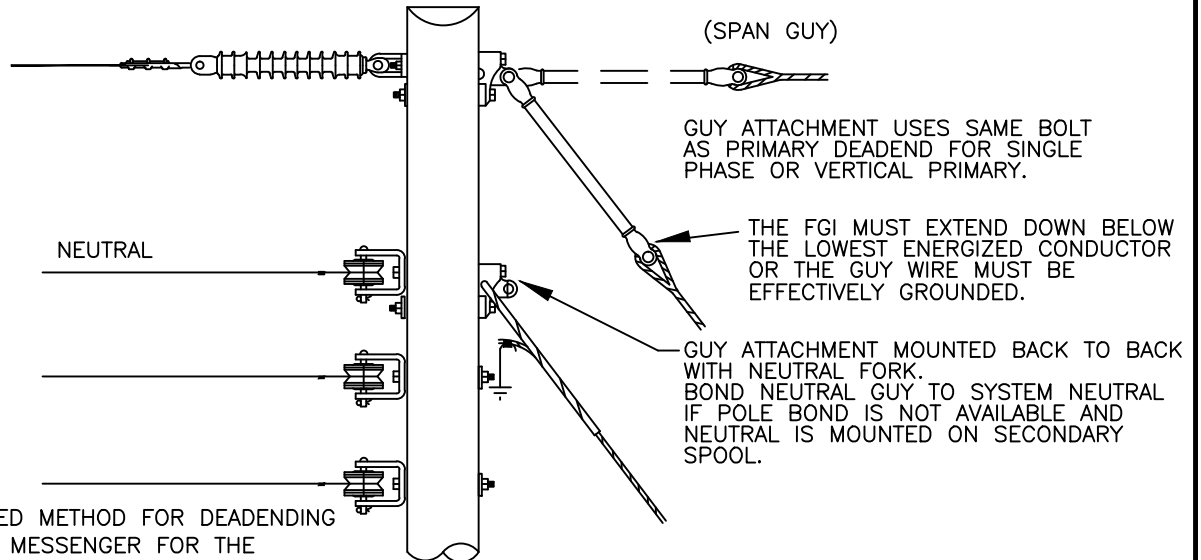


ARM GUYS
USE A GUY THIMBLE WHEN ATTACHING ARM GUYS (WITHOUT FIBERGLASS INSULATORS) TO BOLT EYES ON D.A. BOLTS.

SPAN GUYS
SPAN GUYS ATTACH TO POLE BY SAME METHODS AS SHOWN FOR DOWN GUYS.

FIBERGLASS GUY STRAIN INSULATORS				
	18"	78"	90"	120"
5/16"	131-040-002 *	131-0520-001 *	N/A	N/A
7/16" & 9/16"	131-044-008	N/A	131-060-003	131-070-009

* FOR USE WITH MEDIUM DUTY GUY ATTACHMENT ONLY (M&S 142-186-003)

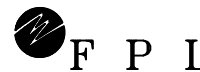


NEUTRAL

NOTE:

1. SHOWN IS PREFERRED METHOD FOR DEADENDING THE 1/2" (7#6 AWA) MESSENGER FOR THE HENDRIX AERIAL SPACER CABLE SYSTEM. USE HEAVY DUTY GUY HOOK (M&S 142-187-000) WITH 3/4" BOLTS.

SFHHA 010109
FPL RC-16



OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: PMG

DRAWN BY: RAS

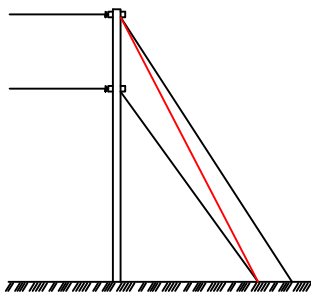
DATE: 8/9/96

APPROVED: J.J. MCEVOY

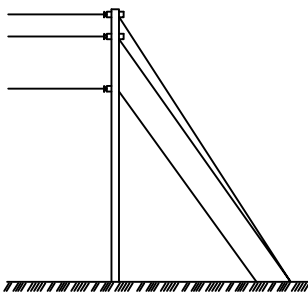
NO SCALE

SUPERVISOR, OH/UG PRODUCT
SUPPORT SERVICES

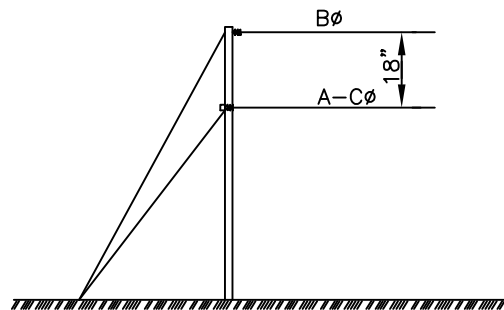
NO.	DATE	REVISION	ORIG.	DRAWN	APPR.
5	12/5/13	UPDATE DRAWING	AR	ELS	WM
4	1/23/07	ADD NOTE	JNM	ELS	JJM
3	9/21/05	ADD NOTE TO TABLE	JNM	ELS	JJM
2	6/30/03	ADD M&S #'S FOR GUY STRAIN INS.	JNM	ELS	JJM
1	7/28/99	ADD NOTE & CHANGE TEXT	JNM	PRH	JJM
0	8/9/96	CHANGED PORCELAIN SUSPENSION INSULATORS TO POLYMER	PMG	RAS	JJM



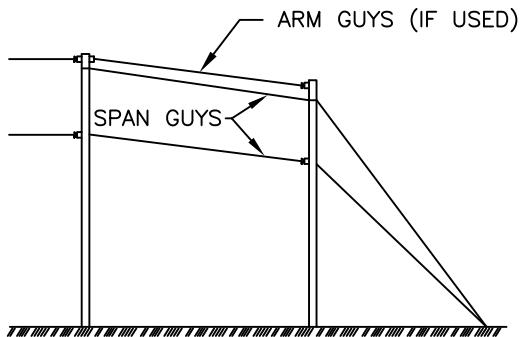
SINGLE CIRCUIT DEADEND
FIGURE 1



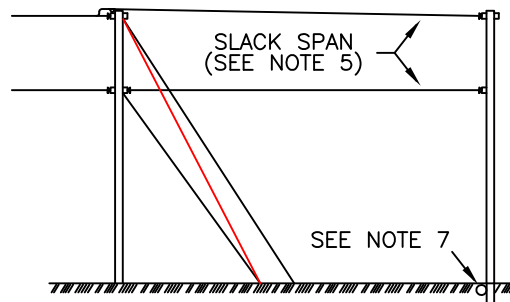
DOUBLE CIRCUIT DEADEND
FIGURE 2



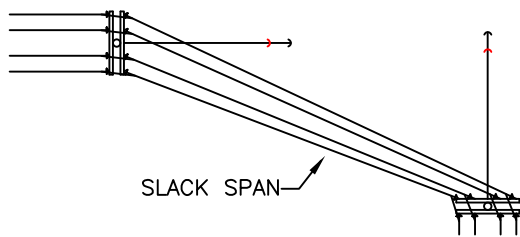
THREE PHASE PRIMARY DEADEND
Bø MOUNTED ON POLE
A & Cø ON CROSSARM
FIGURE 3



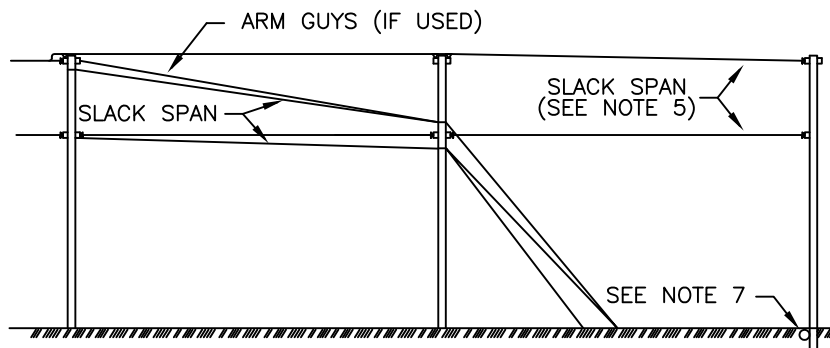
SPAN GUY DEADEND
FIGURE 4



SLACK SPAN DEADEND
FIGURE 5



SLACK SPAN CORNER
FIGURE 6



SLACK SPAN DEADEND WITH INTERMEDIATE POLE
FIGURE 7

NOTES:

1. FOR DETAILS OF GUY ATTACHMENTS SEE D-7.0.0 AND D-7A.
2. TO DETERMINE THE STRENGTH LIMITATIONS OF THE POLE REFER TO DERM 4.2.2.
3. FOR ALLOWABLE TENSIONS IN GUYS SEE D-5.0.0.
4. FOR DETAILS OF ANCHORS SEE D-4.0.1.
5. FOR SLACK SPAN SAGS SEE DERM 4.4. FOR DETAILS OF SLACK SPAN CONSTRUCTION SEE E-5.7.0 (E-29.0.0 FOR MAINTENANCE ONLY).
6. FOR STRENGTH LIMITATIONS OF ARMS SEE E-9.0.0, E-10.0.0 AND E-11.0.0.
7. USE POLE KEY TO BRACE POLE IN LOOSE SOILS (SEE D-3.0.0).
8. FOR DETAILS OF DEADEND FRAMING SEE SECTION E.

SFHHA 010110
FPL RC-16



OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: ARR

DRAWN BY: HO

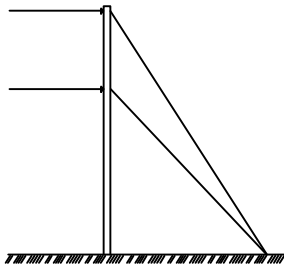
DATE: 1/29/92

APPROVED: R.J. SALESKY

NO SCALE

SUPERVISOR, OH/UG PRODUCT
SUPPORT SERVICES

NO.	DATE	REVISION	ORIG.	DRAWN	APPR.
3	6/29/16	UPDATE DRAWING	DGY	ELS	RDH
2	12/5/13	UPDATE DRAWING	ARR	ELS	WM
1	6/30/93	REVISED FIGURES 3, 4, 5 AND 7	ARR	EH	RJS
0	1/29/92	ADDED NEW NOTES, REVISED SPAN GUYS & SLACK SPANS.	ARR	HO	RJS



SINGLE PHASE PRIMARY
FIGURE 1

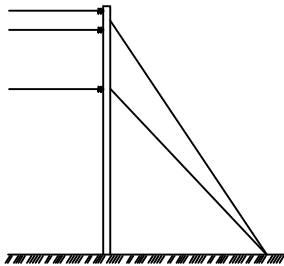
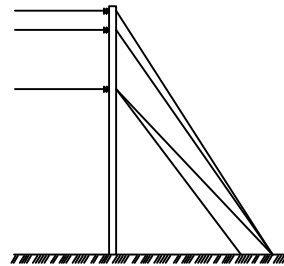


FIGURE 2



TWO PHASE PRIMARY
FIGURE 3

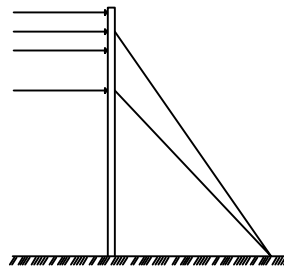
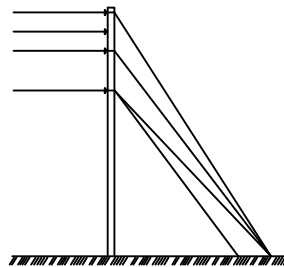


FIGURE 4



THREE PHASE PRIMARY
FIGURE 5

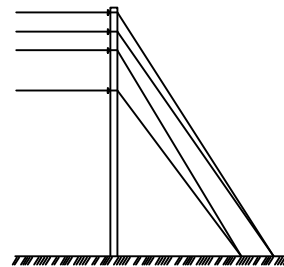


FIGURE 6

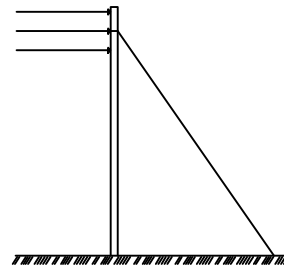


FIGURE 7

SECONDARY

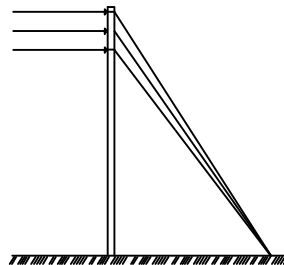


FIGURE 8

NOTES:

1. FOR DETAILS OF GUY ATTACHMENTS SEE D-7.0.1.
2. CONFIGURATION TO BE USED IS DEPENDENT ON CONDUCTOR SPACING AT POLE, STRENGTH LIMITATIONS OF POLE, CONDUCTOR TENSION AND GUY WIRE TENSION.
3. TO DETERMINE THE STRENGTH LIMITATIONS OF THE POLE REFER TO DERM 4.2.2.
4. FOR ALLOWABLE TENSIONS IN GUYS SEE D-5.0.0.
5. FOR DETAILS OF ANCHORS SEE D-4.0.1.
6. FOR DETAILS OF DEADEND FRAMING SEE SECTION E.



SFHHA 010111
FPL RC-16

OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: _____

DRAWN BY: _____

DATE: _____

APPROVED: R. J. SALESKY
DIRECTOR, DISTRIBUTION ENGINEERING
AND OPERATIONS SERVICES

NO SCALE

NO.	DATE	REVISION	ORIG.	DRAWN	APPR.
1	12/5/13	UPDATE NOTE 1	ARR	ELS	WM
0	1-29-92	ADDED NEW NOTES, REVISED SPAN GUYS & SLACK SPANS.	ARR	H.O.	RJS

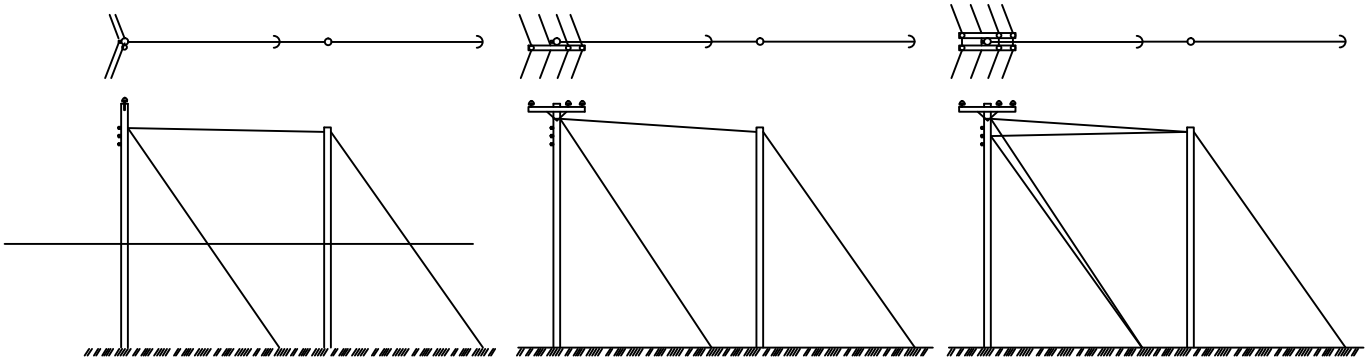
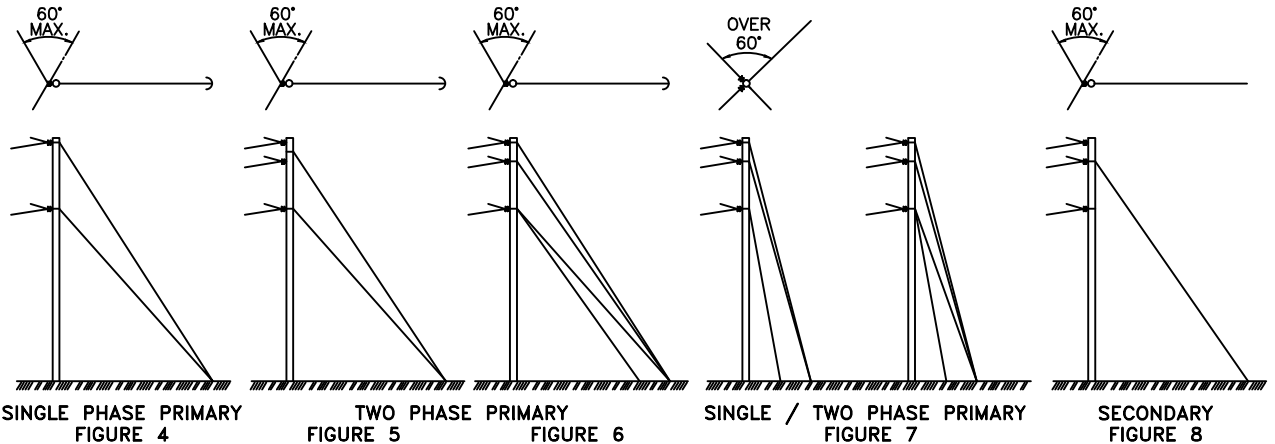


FIGURE 1

ANGLE (SMALL AND MEDIUM)
FIGURE 2

FIGURE 3



SINGLE PHASE PRIMARY
FIGURE 4

TWO PHASE PRIMARY
FIGURE 5

SINGLE / TWO PHASE PRIMARY
FIGURE 7

SECONDARY
FIGURE 8

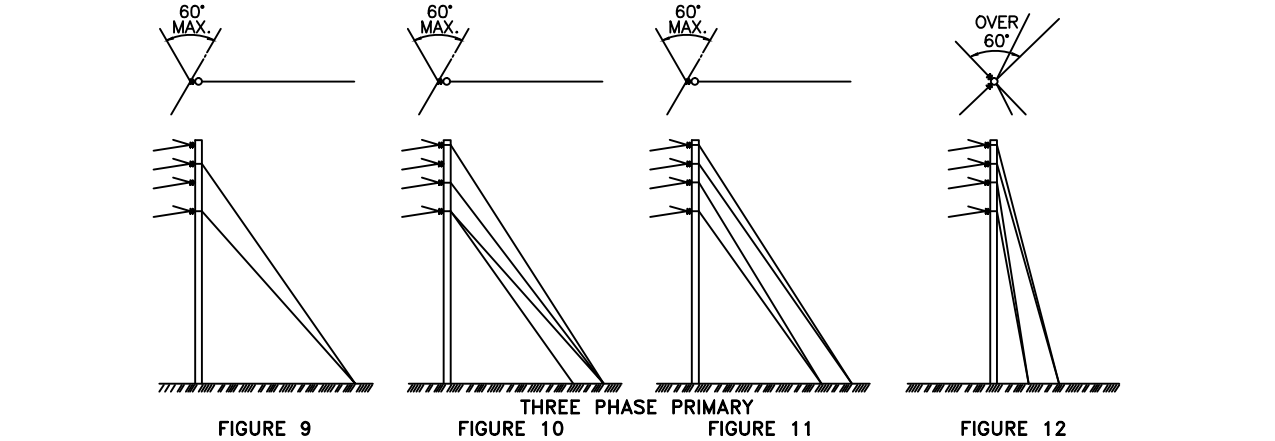


FIGURE 9

FIGURE 10

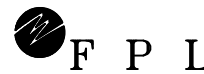
FIGURE 11

FIGURE 12

NOTES:

- FOR DETAILS OF GUY ATTACHMENTS SEE D-7.0.1.
- CONFIGURATION TO BE USED IS DEPENDENT ON CONDUCTOR SPACING AT POLE, STRENGTH LIMITATIONS OF POLE, CONDUCTOR TENSION AND GUY WIRE TENSION.
- TO DETERMINE THE STRENGTH LIMITATIONS OF THE POLE REFER TO DERM 4.2.2.
- FOR ALLOWABLE TENSIONS IN GUYS SEE D-5.0.0.
- FOR DETAILS OF ANCHORS SEE D-4.0.1.
- FOR STRENGTH LIMITATIONS OF ARMS SEE E-9.0.0, E-10.0.0 AND E-11.0.0
- FOR DETAILS OF DEADEND FRAMING SEE SECTION E.

SUPERSEDES D-10 LAST REVISED ON 5-21-57



SFHHA 010112
FPL RC-16

OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: ARR

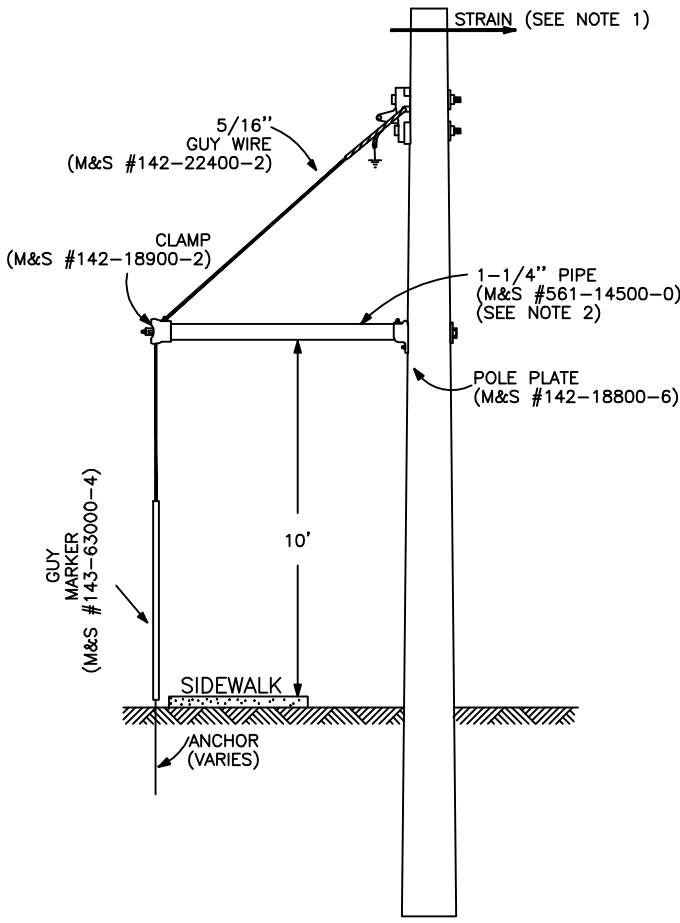
DRAWN BY: HO

DATE: 1-29-92

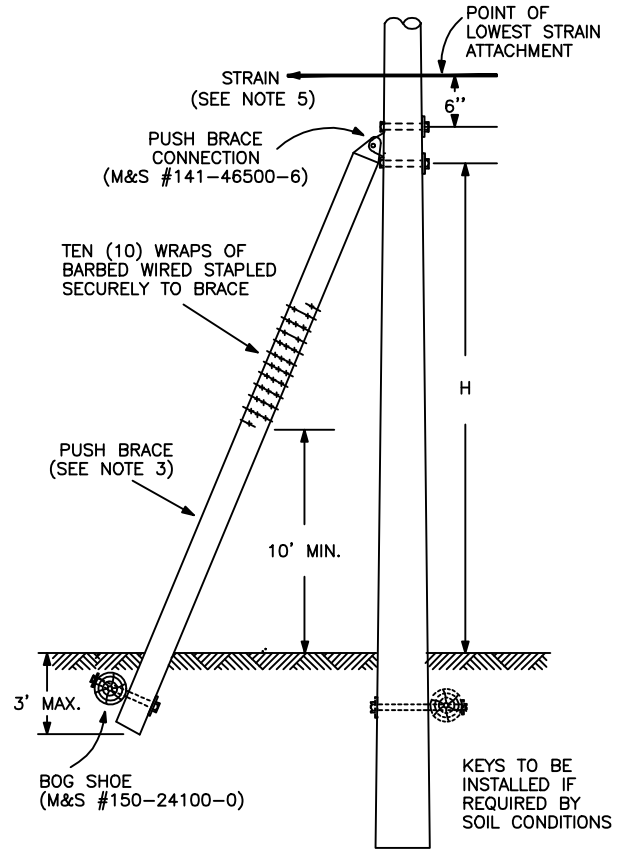
APPROVED: R. J. SALESKY
DIRECTOR, DISTRIBUTION ENGINEERING
AND OPERATIONS SERVICES

NO SCALE

NO.	DATE	REVISION	ORIG.	DRAWN	APPR.
2	12/5/13	UPDATE NOTE 1	ARR	ELS	WM
1	6-30-93	REVISE SPAN GUYS & SLACK SPANS	ARR	JRG	RJS
0	1-29-92	ADDED NEW NOTES, REVISED SPAN GUYS & SLACK SPANS.	ARR	HO	RJS



**SIDEWALK GUY
FIG. 1**



**PUSH BRACE
FIG. 2**

NOTES:

1. MAXIMUM STRAIN IS 1,500 LBS., WHEN USED WITH A MINIMUM CLASS "2" WOOD POLE OR TYPE "III" CONCRETE POLE.
2. CUT PIPE TO SIZE, NOT TO EXCEED 8' LENGTH.
3. PUSH BRACE LENGTH TO BE HEIGHT OF ATTACHMENT (H) PLUS 10 FT. ADJUSTED TO NEAREST POLE LENGTH.
4. FOR BOG SHOE AND KEY INSTALLATION SEE D-3.
5. MAXIMUM STRAIN IS 3,000 LBS., WHEN USED WITH A CLASS 5 WOOD PUSH BRACE.

SUPERSEDES D-11 LAST REVISED ON 4-11-57



F P L

SFHHA 010113

FPL RC-16

OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: AS

DRAWN BY: JRF

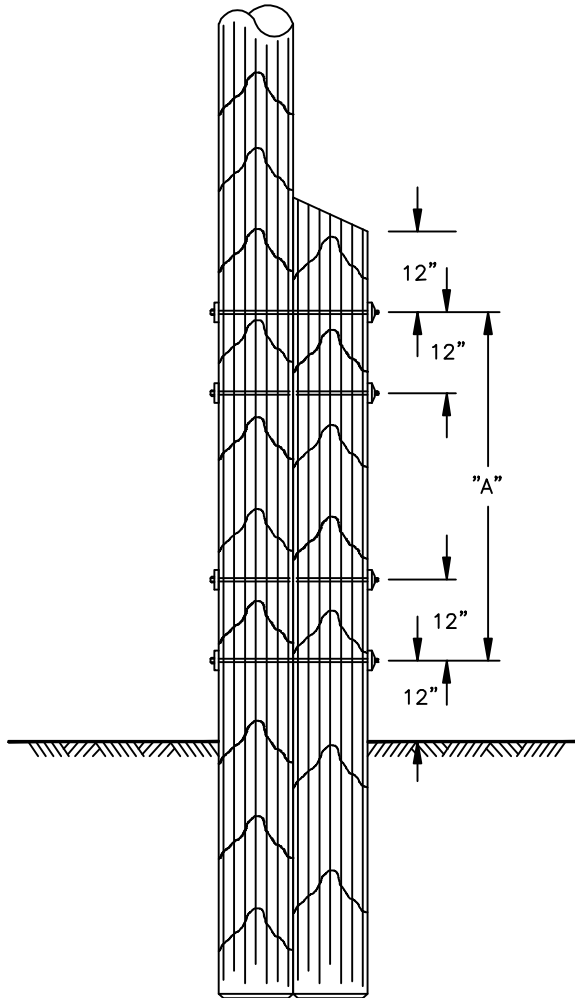
DATE: 1-1-90

APPROVED: R. K. CIELO

NO SCALE

DIRECTOR, DISTRIBUTION ENGINEERING
AND SERVICE PLANNING

NO.	DATE	REVISION	ORIG.	DRAWN	APPR.

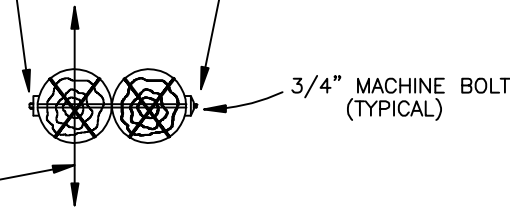


POLE STUBBING SCHEDULE			
POLE HEIGHT & CLASS	DIMENSION "A" (MIN.)	BOLTS REQUIRED	BOLT LENGTH (SEE NOTE 4)
30-6	3'	2	20"
35-5	4'	2	22"
40-5	4'	2	22"
40-4	6'	2	24"
40-3	6'	4	26"
45-5	6'	2	24"
45-4	6'	2	26"
45-3	6'	4	26"
50-2	6'	4	30"

NOTES:

1. USE STUB OF SUCH SIZE THAT GROUND LINE DIAMETER IS EQUAL TO (OR GREATER THAN) GROUND LINE DIAMETER OF OLD POLE.
2. WHEREVER POSSIBLE, SET STUB BESIDE OLD POLE, RATHER THAN IN LINE.
3. IF STUB IS MADE FROM A CUT-OFF POLE, CUT TOP AT APPROXIMATELY 15° ANGLE, AND CAP.
4. BOLT LENGTHS ARE APPROXIMATE, AND GIVEN AS A GUIDE ONLY. (POLE DIAMETERS MAY VARY WITHIN A GIVEN CLASS.)
5. USE SAME SETTING DEPTH FOR STUB AS FOR ORIGINAL POLE, PER SHEET D-3.
6. ALTERNATE METHOD FOR EMERGENCY USE ONLY. SEE D-13.0.1 THRU D-13.0.3 .

M&S #145-32300-1
4"X 4" SQUARE
CURVED WASHER
(TYPICAL)



SUPERSEDES D-12 LAST REVISED ON 5-16-62

SFHHA 010114
FPL RC-16



OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: ARR

DRAWN BY: JRG

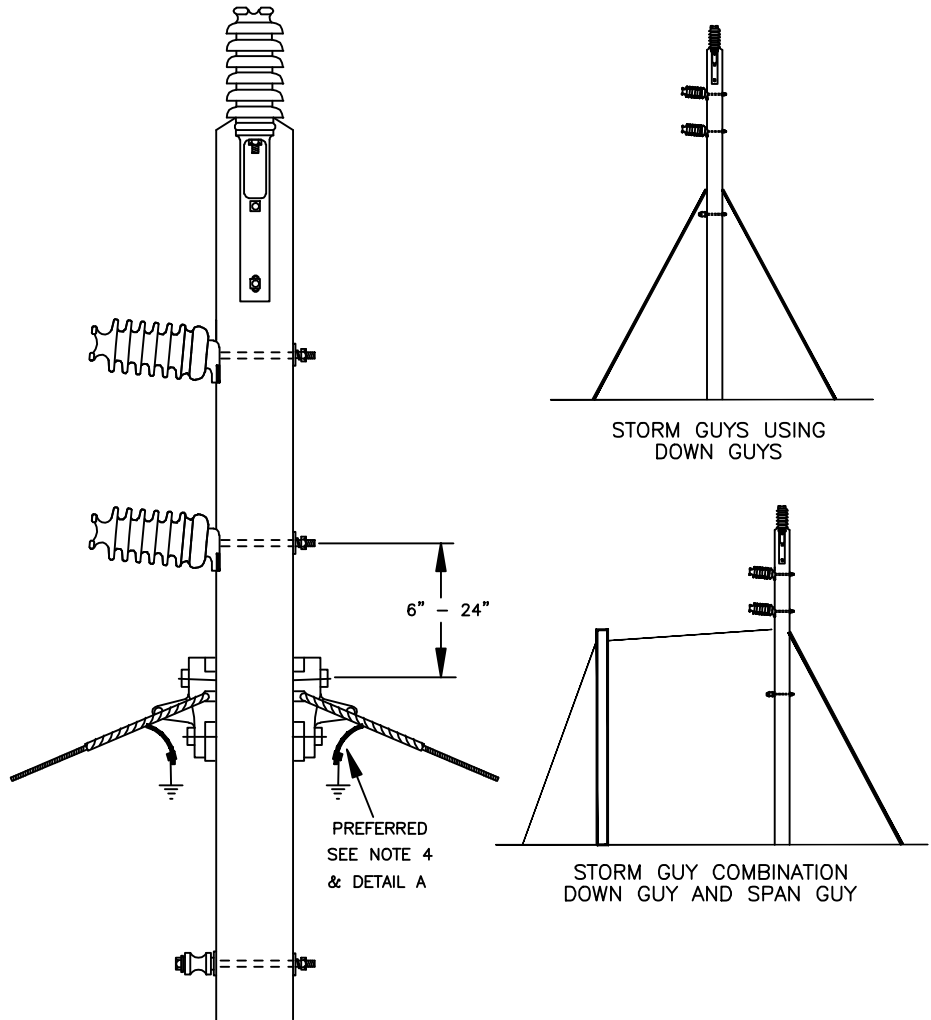
DATE: 6-30-93

APPROVED: R. J. SALESKY

NO SCALE

DIRECTOR, DISTRIBUTION ENGINEERING
AND OPERATIONS SERVICES

NO.	DATE	REVISION	ORIG.	DRAWN	APPR.
0	6-30-93	REVISE POLE STUBBING INFO.	ARR	JRG	RJS



STORM GUYS	
GUY SIZE	ALLOWABLE GUY TENSION
5/16	10080
7/16	18720
9/16	30330

PREFERRED
SEE NOTE 4
& DETAIL A

NOTES:

1. STORM GUYS ARE INSTALLED BACK TO BACK PERPENDICULAR TO THE POLE LINE.
2. EITHER ONE OR BOTH OF THE STORM GUYS MAY BE INSTALLED AS SPAN GUYS TO A GUY STUB POLE.
3. ALL GUYS ARE TO BE EFFECTIVELY GROUNDED UNLESS FIBERGLASS GUY STRAIN INSULATORS ARE USED. (REFER TO D-2.0.0)
4. STORM GUYS ALSO MAY BE INSTALLED ON CROSSARM POLES.
5. SEE DERM ADDENDUM 4.2.2.C FOR GUY SIZE CALCULATIONS.

MINIMUM STORM GUY SIZE MODIFIED VERTICAL FRAMING WITH JOINT USE			
RATIO OF LEAD LENGTH/ATTACHMENT HEIGHT	80%	90%	100%
1 & 2 PHASE LINES	5/16	5/16	5/16
3 PHASE LINES	7/16	7/16	7/16

OPTIMUM GUY IS WHERE LEAD LENGTH = ATTACHMENT HEIGHT (RATIO=100%)
IF DOWN GUYS CANNOT BE INSTALLED, SPAN GUYS TO GUY STUB POLES CAN BE USED

SFHHA 010115
FPL RC-16



OH & UG DISTRIBUTION SYSTEM STANDARDS

ORIGINATOR: JNM

DRAWN BY: E.SCHILLING

DATE: 1/23/07

APPROVED: J.J. McEVOY

NO SCALE

SUPERVISOR, OH/UG PRODUCT
SUPPORT SERVICES

NO.	DATE	REVISION	ORIG.	DRAWN	APPR.
1	2/27/07	UPDATE DWG AND NOTES	JNM	ELS	JJM
0	1/23/07	ORIGINAL DRAWING	JNM	ELS	JJM

FLAGS

NORMALLY ON A PVC OR WIRE STAFF, ARE USED IF FIELD CONDITIONS ALLOW CLEAR SIGHT OF THE FLAGS. NOT TO BE USED WHEN FACE STAKING. FLAGS SHALL BE A MINIMUM OF 4" x 5" WITH A 21" WIRE.

FLAG MARKINGS

THE APPROPRIATE PREPRINTED TYPE MAY BE USED IF FIELD CONDITIONS ALLOW. FLAGS SHALL BE PINK LETTERS ON WHITE FLAG AND PREPRINTED AS FOLLOWS:

- PROPOSED FPL POLE, PROPOSED FPL ANCHOR, PROPOSED FPL TRANSFORMER PAD, PROPOSED ϕ FPL TRENCH,
- PROPOSED FPL ELECTRONIC CABLE MARKER, PROPOSED FPL HAND HOLE

STAKES:

STAKES NORMALLY ARE 24" TO 48" ONE BY TWO'S DEPENDING ON LOCAL PRACTICES AND AVAILABILITY. 8" TWO BY TWO'S, CALLED "HUBS", ARE USED WHERE EXTRA STABILITY IS NEEDED, SUCH AS COW PASTURES, UNPAVED DRIVING AREAS, ETC. AND ARE USUALLY DRIVEN FLUSH WITH THE GROUND.

STAKE MARKINGS

DEPENDING ON SURFACE CONDITIONS AT THE WORK LOCATION, DIFFERENT METHODS OF STAKING MAY BE USED. IN EARTH, STAKES OR HUBS WILL BE USED. NAILS, DISCS AND PAINT WILL BE USED IN PAVEMENT OF ASPHALTIC COMPOSITION, AND CONCRETE WILL BE MARKED AND PAINTED. WHERE DEFINITE POINTS OF ALIGNMENT ARE REQUIRED, SUCH AS RIGHT OF WAYS OR IN FACE STAKING, HUBS WILL HAVE NAILS DRIVEN INTO THEM, NAILS AND DISCS WILL BE USED ON ASPHALT, AND CONCRETE WILL BE DRILLED AND PAINTED TO INDICATE THOSE POINTS.

REGARDLESS OF THE LOCATION'S CONDITION, OR OF THE METHOD OF STAKING USED, CERTAIN MARKINGS MAY BE USED BY THE SURVEY CREW TO INDICATE TO THE APPROPRIATE WORKING CREW WHAT EACH STAKED LOCATION REPRESENTS. THE FOLLOWING IS A LIST OF THE MOST COMMONLY USED MARKINGS. ON THE STAKES, THESE MARKING WILL BE ON THE 2" SIDES. ON PAVED SURFACES, THESE MARKINGS WILL BE PAINTED.

- "ANC" - INDICATES LOCATION OF THE EYE OF THE ANCHOR ROD.
- "ANC" - INDICATES LOCATION OF THE EYE OF THE ANCHOR ROD.
- "FPL" - INDICATES MARKINGS ON PAVEMENT (IF EXISTING) PERPENDICULAR AND IN CLOSE PROXIMITY TO THE POLE LOCATION.
- POLE CENTER STAKING SYMBOLS - ANY ONE OF THE FOLLOWING DETERMINES LOCATION OF THE CENTER OF THE POLE.
 - "CTR. POLE" OR "POLE" MARKED ON A STAKE.
 - "□" OR "O" WITH "POLE" IN THE CENTER, ON PAVED SURFACES OR SIDEWALK. (A NAIL & DISK WITH RIBBON MARKED "POLE" MAY ALSO BE USED.)
- " ϕ TRENCH" OR " ϕ FPL TRENCH" - INDICATES CENTER LINE ALONG WHICH A TRENCH IS TO BE DUG.
- "TX Δ " OR "CTR TX PAD" - INDICATES THE LOCATION OF THE CENTER OF A TRANSFORMER PAD.
- "10' O/S ϕ TX PAD" & "20' O/S ϕ TX PAD" - OFFSET REFERENCE STAKE 10' & 20' FROM THE CENTER OF TRANSFORMER PAD, ALONG ITS CENTER LINE PERPENDICULAR TO TRENCH.
- "CTR HANDHOLE" - LOCATION OF CENTER OF HANDHOLE.
- "10' O/S ϕ HANDHOLE" & "20' O/S ϕ HANDHOLE" - OFFSET REFERENCE STAKE 10' & 20' FROM THE CENTER OF THE THE HANDHOLE ALONG ITS CENTERLINE PERPENDICULAR TO TRENCH.
- "CTR MARKER" - LOCATION OF THE CENTER THE MARKER.
- "10' O/S ϕ MARKER" & "20' O/S ϕ MARKER" - OFFSET REFERENCE STAKE 10' & 20' FROM CENTER OF MARKER PERPENDICULAR TO TRENCH.
- " ∇ " - GRADE AT CENTER OF PAD OR HANDHOLE. A NOTATION INDICATING NUMERICALLY HOW MUCH TO CUT OR FILL MAY BE PRESENT WHERE NECESSARY.
- "HH" - OFFSET REFERENCE PAINT MARK ON PAVEMENT (IF EXISTING) PERPENDICULAR AND IN CLOSE PROXIMITY TO THE HAND HOLE. CAN BE USED FOR OFFSET PURPOSES.
- "MKR" - OFFSET REFERENCE PAINT MARK ON PAVEMENT (IF EXISTING) PERPENDICULAR AND IN CLOSE PROXIMITY TO THE MARKER. CAN BE USED FOR OFFSET PURPOSES.



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FPL RC-16

OH & UG DISTRIBUTION SYSTEM STANDARDS

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1	9/04/01	UPDATED DRAWING (TITLE & TEXT)	DPM	JES	JJM
0	8/09/96	CHANGE PAGE FORMAT	PMG	RAS	JJM
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APPROVED: J.J. MCEVOY
SUPERVISOR, OH/UG PRODUCT
SUPPORT SERVICES

NO SCALE

COLOR CRAYONS, PAINTS, AND PLASTIC RIBBONS MAY BE USED FOR IDENTIFYING STAKES. THE FOLLOWING A.P.W.A. COLORS HAVE BEEN ADOPTED STATEWIDE AS STANDARD:

- WHITE
PROPOSED EXCAVATION
- PINK
TEMPORARY SURVEY MARKINGS
- RED
ELECTRIC POWER LINES, CABLES, CONDUIT AND LIGHTING CABLES
- YELLOW
GAS, OIL, STEAM, PETROLEUM OR GASEOUS MATERIALS
- ORANGE
COMMUNICATION, ALARM OR SIGNAL LINES, CABLES OR CONDUIT
- BLUE
PORTABLE WATER
- PURPLE
RECLAIMED WATER, IRRIGATION AND SLURRY LINES
- GREEN
SEWER AND DRAIN LINES

ALL COLOR STAKES USED BY FLORIDA POWER & LIGHT COMPANY (EXISTING FACILITIES) WILL BE RED AS DESIGNATED BY ANSI STANDARD Z53.1, ISS-NBS VIVID RED #11. THIS COLOR IS AVAILABLE AS SPRAY PAINT UNDER M&S #504-17100-5.

WHITE PER A.P.W.A. WILL BE USED TO MARK PROPOSED FPL FACILITIES. CRAYONS AND PLASTIC RIBBONS USED FOR STAKING FP&L FACILITIES SHOULD APPROXIMATE THESE COLORS.

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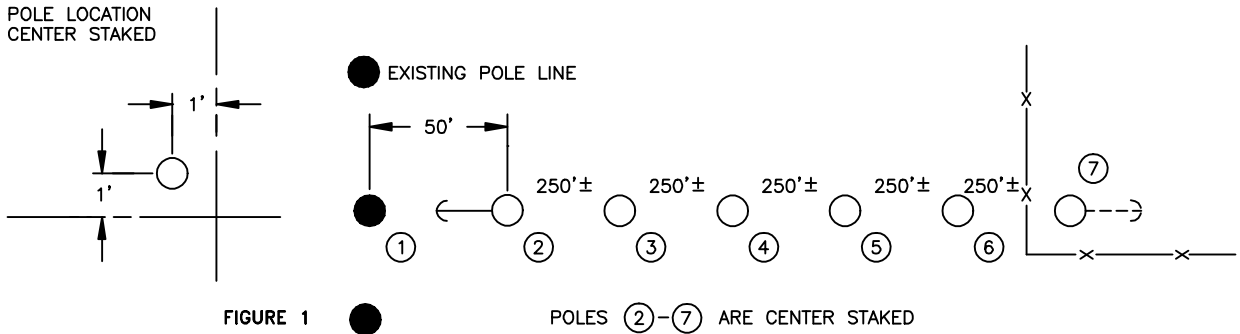
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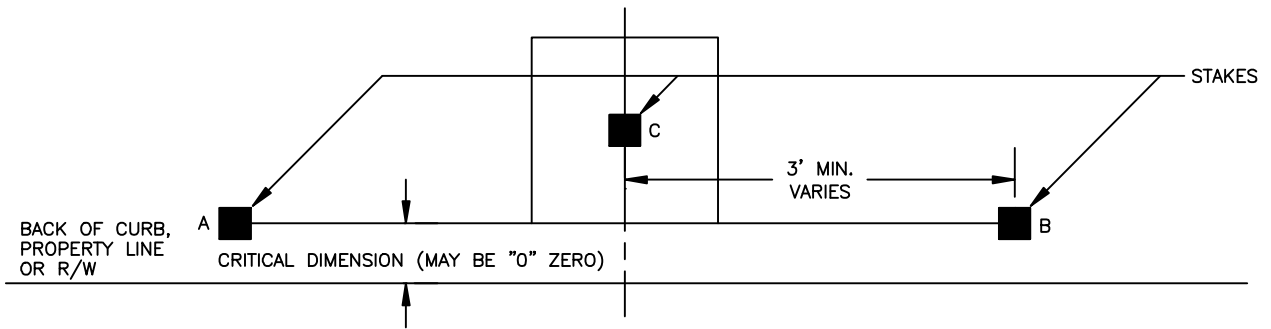
POLE AND ANCHOR STAKING

1. AN ANCHOR STAKE LOCATION REPRESENTS THE LOCATION OF THE EYE OF THE ANCHOR ROD.
2. WOOD OR CONCRETE POLES THAT ARE TO BE SET 6' IN RIGHT-OF-WAY AND WOOD POLES THAT ARE TO BE SET 1' IN PROPERTY WILL BE POLE CENTER STAKED. POLES SHOULD ALSO BE CENTER STAKED WHEN IT IS NOT NECESSARY TO HAVE AN EXTREMELY ACCURATE POLE SETTING.



3. WHERE MORE ACCURATE POLE SETTING IS REQUIRED, SUCH AS AT THE RIGHT-OF-WAY LINE OR THREE INCHES BACK OF THE CURB, THE POLE MAY BE FACE STAKED. A STRING PULLED BETWEEN TWO ADJACENT STAKES, MARKED AS FOLLOWS, DETERMINES THE SPECIFIED FACE LOCATION. WHERE NECESSARY THESE MARKINGS MAY BE ABBREVIATED OR SPELLED OUT. F.F. OR FIELD FACE S.F. OR STREET FACE.

A MINIMUM OF THREE POINTS SHOULD BE MARKED. TWO OF THESE MUST DETERMINE THE LINE THAT THE SPECIFIED FACE OF THE POLE WILL BE AGAINST. THE THIRD TIES THE POLE DOWN AS TO ITS LATERAL POSITION BETWEEN THE FIRST TWO.



"A" & "B" ARE MARKED (AS IN "STAKE MARKINGS") TO INDICATE WHAT FACE OF THE POLE IS TO BE DETERMINED BY THEIR LOCATION. A NAIL WILL BE DRIVEN INTO EACH HUB, HOLES WILL BE DRILLED AND MARKED ON CONCRETE, AND NAIL AND DISCS WILL BE USED ON ASPHALT TO AID IN ALIGNMENT. "C" IS MARKED "C POLE" TO INDICATE THAT THE POLE IS TO BE LOCATED ALONG THIS AXIS, PERPENDICULAR TO LINE FROM "A" TO "B". POLE LOCATION NUMBERS ON THE STAKE MAY BE PRESENT TO AID IN IDENTIFICATION.



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SUPERVISOR, OH/UG PRODUCT SUPPORT SERVICES

NO SCALE

TRANSFORMER PAD, HANDHOLE & MARKER STAKING

1. TRANSFORMERS, PADS AND MARKERS ARE MOST OFTEN POSITIONED AT OR NEAR THE TRENCH CENTERLINE. AS A RESULT THE STAKES ARE USUALLY DUG UP DURING TRENCHING. OFFSET OR FACE STAKES ARE USEFUL TO THE CONSTRUCTION FORCES TO RE-ESTABLISH THE LOCATION OF THE FACILITIES AFTER TRENCHING. STAKE CENTER LINE OF HANDHOLE & MARKERS. THE FOLLOWING SKETCHES ARE EXAMPLES OF FACE STAKING AND OFFSET REFERENCE STAKING. FACE STAKING IS PREFERRED, PARTICULARLY FOR TRANSFORMER PADS, BUT OFFSET REFERENCE STAKES MAY BE NEEDED AT TIMES IF TREES OR OTHER OBSTRUCTIONS PREVENT THE USE OF FACE STAKES. ADDITIONAL STAKES SUCH AS CORNER STAKES MAY BE USED TO SUIT LOCAL CONDITIONS.

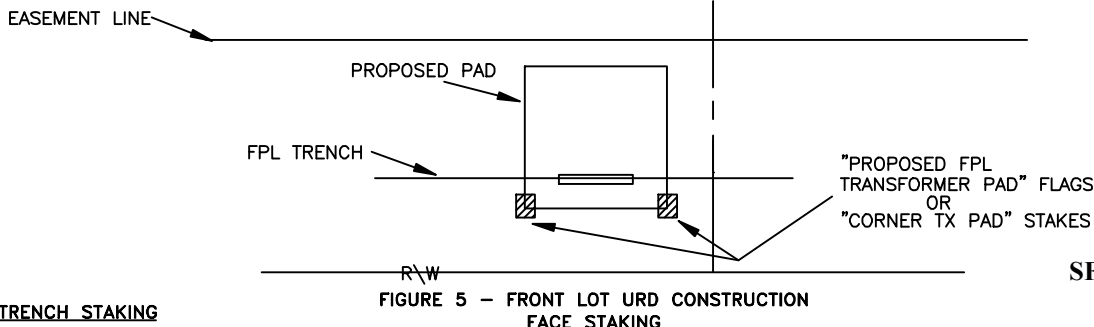
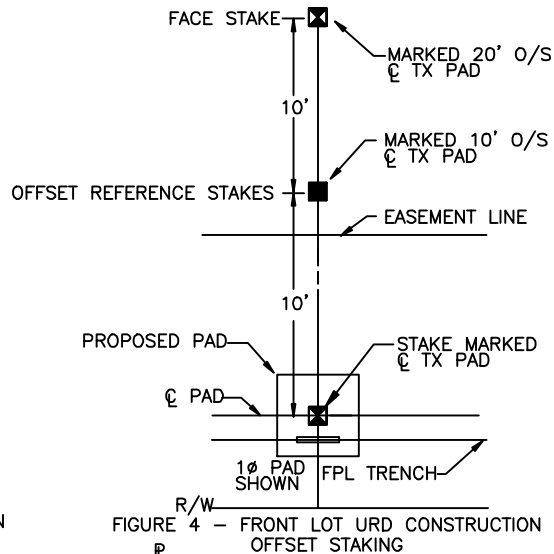
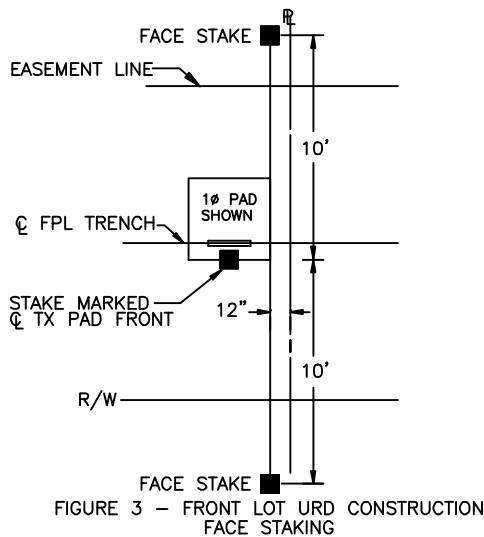
2. WHERE GRADE STAKES ARE REQUIRED, INSTALL AFTER TRENCHING AT PAD OR HANDHOLE.

TRANSFORMER PAD, HANDHOLE, MARKER & MANHOLE STAKING

1. THE FOLLOWING TABLE GIVES THE DIMENSIONS OF THE CONCRETE TRANSFORMER PADS TO AID IN ACCURATE STAKING.

PAD TYPE	W	L	APPLICATION
UX-115	6'-8"	5'-0"	3ø LF PM W/SECT.
UX-116	6'-0"	5'-0"	3ø & 2ø W/O SECT. & 3ø DF W/SECT.
UX-117	4'-0"	4'-7"	ALL 1ø
UX-119	9'-10"	10'-6"	PADMOUNTED AUTOTRANSFORMER
UN-18	10'	5'	FEEDER SPLICE BOX

LENGTH AND WIDTH OF CONCRETE PADS



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TRENCH STAKING

CENTER LINE OF TRENCH STAKES SHOULD BE APPROXIMATELY 50' APART EXCEPT ON CURVES, WHERE 25' OR 30' SEPARATION SHOULD BE MAINTAINED. ON SMALL RADIUS CURVE THERE SHALL BE A MINIMUM OF 4 STAKES (PC, PT & 2 ONLINE) TO AVOID "CUTTING THE CORNER". DIFFERENT METHODS OF STAKING, SUCH AS A STAKE PER LOT, MAY BE USED IF LOCAL CONDITIONS REQUIRE THEM.



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