December 20, 2006

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Missouri Public Service Commission

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DEC 2 8 2006

UTILITY SERVICES DIV. PUBLIC SERVICE COMMISSION

Mr. Bob Schallenberg
Director of Utility Services
Missouri Public Service Commission
200 Madison Street, Ste. 220
Jefferson City, MO 65101

Dear Mr. Schallenberg:

I'm an AmerenUE ratepayer in St. Louis who sees an opportunity for the utility to reduce expenses by modifying some of its distribution construction practices. The modifications I propose would trim costs without compromising safety or reliability, and would bring Ameren's construction practices into line with those of many other electric utilities. The savings would be modest, but why should ratepayers pay a penny more than we have to provide for a safe and reliable power-delivery system?

3-Phase Pole Framing

I propose that Ameren generally switch from ridge-pin framing to flat framing for 3-phase poles, particularly in cities, where spans are short and flat design excels. In flat framing, all 3 primary phases are attached to arm pins on the crossarm. Foregoing ridge pins would save money. Ameren should restrict ridge pins to single-phase poles, and to those 3-phase poles in rural areas where long spans make them cost effective.

Ameren engineers confirm that this change would save money. One engineer estimated the savings at $25,000 a year systemwide – and that was several years ago, prior to Ameren's acquisition of Central Illinois Light and Illinois Power. He told me he might pursue this change if cost-cutting pressures intensified at Ameren, but expressed concern that the change might anger an IBEW local.

Many U.S. utilities rely on flat construction for 12- and 13-kV poles, and virtually all of them use it for 4-kV poles. Kansas City Power & Light, Empire District Electric, and Louisville Gas & Electric (Kentucky) never use ridge pins on 3-phase poles, and Commonwealth Edison (Illinois) limits their use to rare spans exceeding 200 feet. Likewise, Aquila restricts ridge pins to long, rural spans. I have asked the standards engineers at each of these utilities why they use flat framing, and their reply is the same: "It performs well and saves money."

Ridge pins were developed for America's rural-electrification projects and are undeniably cost effective in rural areas. But in cities, flat framing offers some cost and engineering advantages. For starters, flat design costs less than ridge-pin design. Flat also reduces labor expense by expediting pole replacement, as the center (B) phase is not "in the way" at the center of the right-of-way. Flat design also offers a compact profile, which is useful in cities, where circuits often turn and cross or must be underbuilt. And flat design can improve a pole's critical flashover voltage rating. Like many Missouri municipals, Columbia Water & Light relies on flat construction, and its well-respected engineer, Dan Clark, in the enclosed note, explains why CW&L uses flat design while neighboring Boone Electric, a rural coop, does not. Based on the practices of other utilities, I am

Exhibit No. 8
Case No. ER-2007-0002
Date 1-8-07 Reporter
Public Hearing St. Louis's Comm. College

certain that Ameren could safely use flat construction throughout its urban 4-kV territory in St. Louis City and County, as well as in cities in its 12-kV territory. Linemen from other utilities are often surprised and mystified by Ameren's near-total reliance on ridge pins for 4-kV poles, when they use flat framing for their own 12- and 13-kV poles.

I understand Ameren's near-total reliance on ridge-pin design is the result of IBEW Local 1439's safety committee, which believes this design offers greater safety. But this design inflates Ameren's costs, and I've yet to see any evidence that flat construction endangers linemen. Let's face it – no utility would allow flat pole construction if it were unsafe. Ameren has a flat design option in its standards book that meets all safety requirements. But sadly, it is seldom used. I've asked individual Ameren linemen about flat framing and none has expressed opposition to it. They point out that they use it from time to time. Other IBEW locals around the country have no objection to this design. How does Local 1439 explain the fact that IBEW linemen in Detroit, Kansas City, Chicago, Louisville and countless other places use flat design without objection or difficulty?

It would appear that a few men in a union local may be dictating a construction practice that is inflating Ameren's costs without a compelling justification, but Ameren doesn't wish to confront them. So the utility passes this unnecessary cost on to its customers in order to maintain harmony with 1439. Meanwhile, other Missouri utilities are free to use the lower-cost construction alternative. Ameren has grown into a big regional utility with, I believe, 14 IBEW locals; yet I believe only 1439 has objected to flat framing.

The solution may be dual framing standards – flat in cities, and ridge-pin in rural areas. Other utilities do this. Niagara Mohawk is a good example. Its 5-kV system in the city of Buffalo, New York, is flat, while its rural 15- and 25-kV systems are ridge-pin.

I urge the Public Service Commission to encourage Ameren to switch to lower-cost flat construction wherever feasible. Perhaps 1439 wouldn't even fight it. The local may no longer feel strongly about this issue anymore, as its officers have changed over the years. My sense is Ameren may be willing to make this change, but it needs an outside impetus like a PSC recommendation in order to approach Local 1439.

Secondary Clevises & Racks

I propose that Ameren dramatically reduce its use of extension clevises and clevis racks for neutrals and secondaries. This practice seems to be confined to AmerenUE's territory in and around St. Louis, but the added cost is not justified. I understand this practice, too, originated with 1439's safety committee. I don't know of another U.S. utility that uses extension clevises for virtually all situations, as is the case in St. Louis. Many utilities use only standard clevises, and those that do use extension clevises generally limit their use to transformer poles, where it may be desirable to hold the secondaries out some distance from the pole and transformer. Most Ameren districts appear to be following the prevailing industry practice of relying primarily on standard clevises, and this practice should be adopted in the 1439 territory, too.

PVC Conduit & Transformer Placement

Finally, I propose that Ameren dramatically reduce its use of PVC conduit on 4-kV poles. This conduit is used primarily to enclose and guide stingers between primary phases and transformers, and can generally be avoided if crews build poles properly – i.e., by placing transformers between the primaries and secondaries, and by positioning them so that the bushing is aimed toward the intended primary phase. When transformers are mounted above secondaries and bushings are aimed correctly, it is safe to use "flying taps" – stingers that fly through the air. This is less expensive than channeling stingers through PVC tubes fastened to poles and crossarms. And this change should be easy to institute, as flying taps are required in most of Ameren's system, where 12-kV voltage prohibits the use of PVC conduit. The same construction discipline practiced in the 12-kV territory needs to be introduced in the 4-kV territory.

Summary

The 3 construction changes I propose would save Ameren and its ratepayers some money without adversely impacting safety or power delivery. Other utilities use the construction practices I propose with good results. Moreover, the clevis and conduit practices I favor are not only the rule at other utilities, but are the rule at Ameren, too, outside of the 1439 St. Louis urban zone. The practices I propose are not questionable or untested, but are widely accepted in the electric-power industry.

I understand the Public Service Commission has the authority to investigate the costs of utilities' construction practices, and I therefore would urge the Commission to examine Ameren's current practices cited above, and then estimate the savings from the proposed changes. Adoption of such changes could then become a condition for approval of an Ameren rate increase.

Again, it's my impression that some or all of the cost-inflating practices cited above were Local 1439's idea – not Ameren's – and that Ameren might be amenable to the changes I propose. A rate-hike condition from the PSC might motivate Ameren to confront 1439.

Sincerely,
Barrett Williams

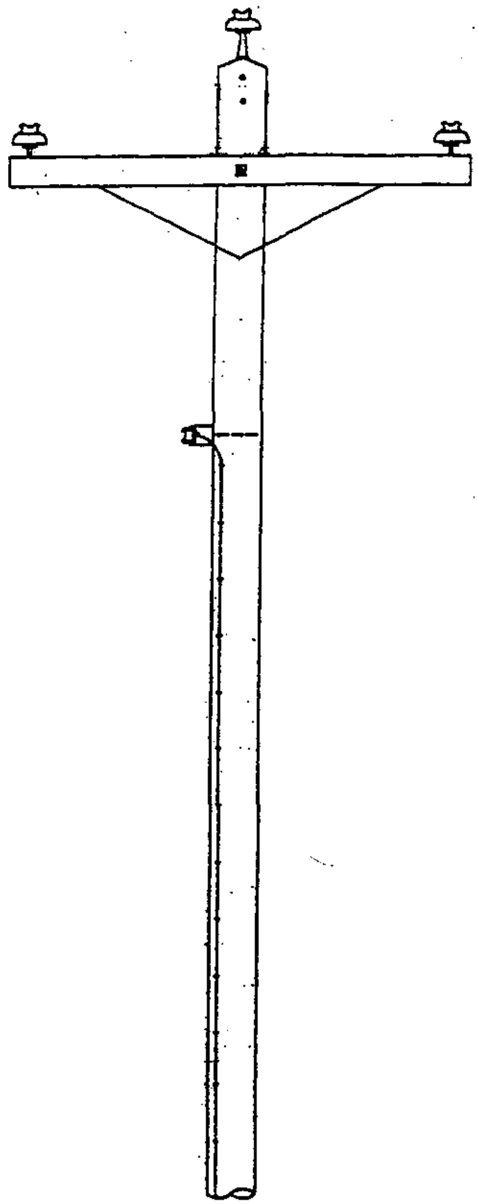
Barrett M. Williams
4475 West Pine Blvd. #1004
St. Louis, MO 63108
(314) 652-9350; tass92@juno.com

cc: Lewis Mills Jr.
Enclosures

Accompanying Exhibits

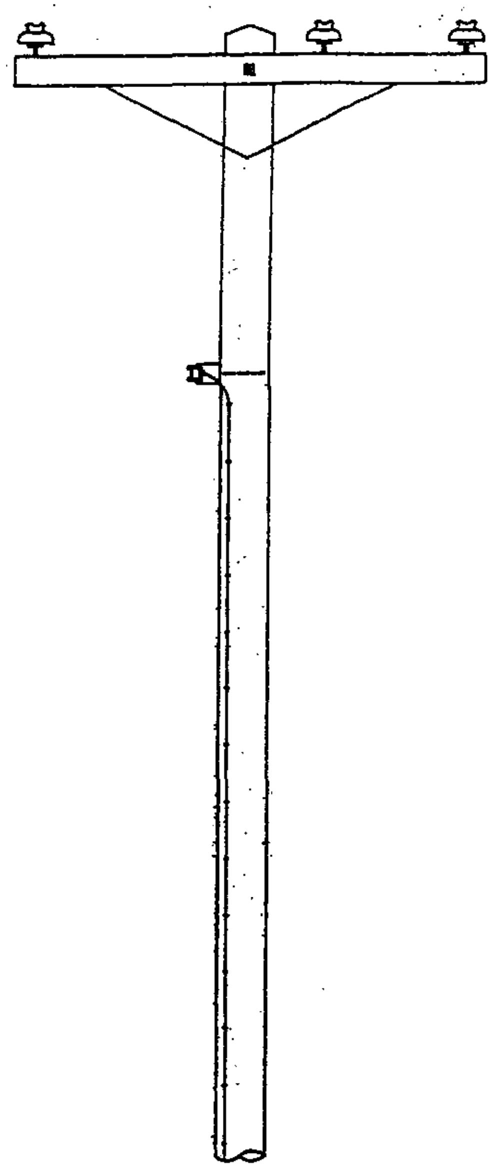
- Drawing: 3-phase distribution poles, flat design and ridge-pin design.
- Letter from Ameren Supervising Engineer Bart Angeli regarding flat design.
- My reply to Mr. Angeli. (He never responded to my request to meet with him to discuss these construction issues before my contacting state regulators.)
- Comments of Dan Clark of Columbia MO municipal in support of flat design.
- Drawing: flat 3-phase design standard of Columbia MO municipal.
- Drawing: flat 3-phase design standard of Springfield MO municipal.
- Drawing: flat 3-phase design standard of Kansas City Power & Light.
- Drawing: flat 3-phase design standard of Aquila - Missouri Public Service.
- Drawing: flat 3-phase design standard of Commonwealth Edison.
- Drawing: flat 3-phase design standard of Entergy.
- Photos (12) of Ameren poles illustrating good and bad construction practices.

Ridge-Pin Design



Ridge-pin design is cost effective in rural areas, as the ample space between the three phases allows for very long spans and fewer poles. For this reason, it is the preferred choice of rural coops.

Flat Design



In cities, where concentrations of customers, junctions, switches, and turns require many closely-spaced poles, ridge-pin design loses its cost advantage. Here, flat design offers lower cost and various other benefits. Flat framing is the preferred choice of most urban and municipal systems.

Ameren Services

One Ameren Plaza
1901 Chouteau Avenue
PO Box 66149
St. Louis, MO 63166-6149
314.621.3222

June 9, 2005

Mr. Barret M. Williams
4475 West Pine Blvd. # 1004
St. Louis, MO 63108

Dear Mr. Williams,

Jeff Hartenberger forwarded your letter of May 9, 2005 as I am the Supervising Engineer of Standards. I read your letter with great interest as it is very unusual for a non-employee to have, and express, such a keen understanding of utility construction practices. Furthermore it is certainly more unusual to have someone take time from their daily life to share potentially cost saving proposals with Ameren.

Ameren

I have read some of your previous correspondence regarding the value of ridge pin construction and the potential cost savings for adopting flat construction for urban construction. While adopting a flat design would reduce construction cost, it would not eliminate the ridge pin from inventory for it is used for single phase construction. In fact many of the existing three phase circuits were initially single phase prior to the other phases being added years later. So the potential material cost savings would be limited to only new three phase construction.

As you are undoubtedly aware Ameren has four operating companies (AmerenCILCO, AmerenCIPS, AmerenIP and AmerenUE) each with a long history of development and success. Members from all four companies meet monthly to discuss, evaluate and select materials and standards to be the one way for all four operating companies. Ameren is in process of reviewing all of our construction standards. Our selection for the one Ameren standard is based upon many parameters with cost certainly included in the analysis. While material cost is a significant component of the selection process, it is not a dominate factor. Installation, component life, electrical performance, to name a few other factors, often become dominate and overshadow the material cost.

At this time I cannot provide a definitive schedule for review of the three phase distribution standard. I surmise it will occur in the latter part of review as there are other standards with much larger potential cost savings. Given this process has been underway for over a year and a half and that we recently added AmerenIP, I would not be surprised if three phase distribution standard is not reviewed for several more years.

I wish to thank you for your continuing interest in Ameren's construction practices and thank you for your input.

Sincerely,

Bart P. Angeli

Bart P. Angeli, P.E.
Supervising Engineer, Standards Group
Transmission & Distribution Design
Ameren Services
P.O. Box 66149, M.C. 450
St. Louis, MO 66149-6149

July 17, 2006

Mr. Bart P. Angeli, P.E.
Supervising Engineer of Standards
Transmission & Distribution Design
Ameren Services
P. O. Box 66149 - M. C. 450
St. Louis, MO 66149-6149

Dear Mr. Angeli:

Thanks for your thoughtful letter of June 9, 2005, and please forgive this very late reply.

I appreciate your willingness to explore the substitution of flat 3-phase pole construction as part of your ongoing effort to adopt uniform construction standards for Ameren's four operating companies. I continue to believe this modest design change in urban areas would yield savings to Ameren without adversely affecting safety or reliability.

Would it be possible to meet briefly with you sometime this summer? I'd like to discuss not only the pole-framing issue, but two other construction practices that appear to be driven by Local 1439. Ameren's new rate request may offer an opportunity to review the merits of these practices and expenses. Before pursuing this matter with state regulators, I'd like to have your thoughts and advice. Please let me know if this would be possible.

Thanks again for your letter and your courtesy. I grew up in St. Louis with Ameren-Union Electric and have great respect for my hometown electric company. Please know that my suggestions are offered in the spirit of making a good company better.

Sincerely,

Barry Williams

Barrett M. Williams
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(314) 652-9350
tass92@juno.com

Enclosure

From: "Dan Clark" <DHC@GoColumbiaMO.com>
To: <tass@utinet.net>
Cc: "Andrew Alexander" <amalexan@GoColumbiaMO.com>; "Joni Troyer" <JBT@GoColumbiaMO.com>; "John Blakemore" <JTB@GoColumbiaMO.com>
Sent: Friday, July 26, 2002 10:18 AM
Subject: Re: CW&L 3-Phase Pole Framing

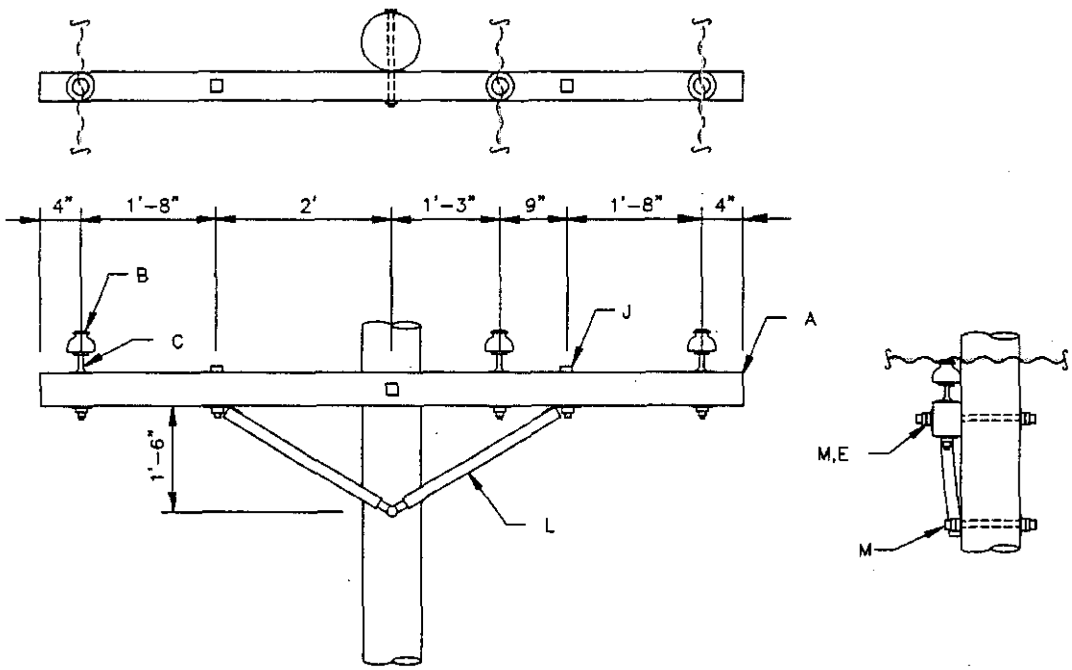
Interesting discussion. Boone Electric appropriately uses ridge pin design because they have small, high tensile strength conductors and enormously long spans (often exceeding 300 ft) that result in considerable conductor blow out when you have a transverse wind. Elevating the center 'B' phase keeps it from contacting the outboard 'A' and 'C' phases when the conductors swing back and forth in the wind and maximizes phase to phase clearance between 'A' and 'C' which are at the same level.

We have much heavier conductors than Boone which don't swing much in the wind, and shorter spans because lots within City limits tend to be much smaller than out in the county. So, having 'A' phase and 'B' phase only 29 inches apart on the same side of the arm has not caused us any trouble. Also, many of our big three phase lines are attached as an underbuild crossarm circuit below our 69KV transmission that loops around the City going from one substation to another, so we had to come up with a design that works without a ridge pin, because ridge pins can only be used for single circuit poles. We turn a lot of 90° corners with three phase lines and here again, flat design is more compact than an elevated center phase. As far as balancing moments, we try to put 'A' and 'B' on one side of the crossarm, and 'C' on the other side, which is an unbalanced moment. But, going down the pole 3', we attach the neutral to the 'C' phase side of the pole, which tends to balance the moments. Some unbalanced moment is acceptable, (you never know which side of the pole telephone and catv will attach to) the thicker poles we use can take the stress. We use 40'-3 poles for single phase lines and 45'-3 poles for single crossarm three phase lines, then we go to 50'-2 poles if there are two crossarms, etc.

We do have the ridge pin design in our spec book, and we prefer it for special situations like down at the McBaine Bottoms where our well field is—the soybean farmers want to have as few poles as possible, and our loads are small and the winds can be fierce.

>>> "Barrett Williams" <tass@utinet.net> 07/26/02 09:11AM >>>
Dan, I think CW&L is wise to rely heavily on "flat" 3-phase framing -- ABC phases flat on the crossarm, no B ridge pin. Flat design costs less than ridge-pin framing, and performs very well in urban areas, where spans are short. (I realize CW&L uses ridge-pin design, too, but only on long, rural spans where greater phase separation is required.)

COLUMBIA WATER & LIGHT
13.8 KV PRIMARY



* AS REQUIRED
O = OWNER FURNISHED
C = CONTRACTOR FURNISHED

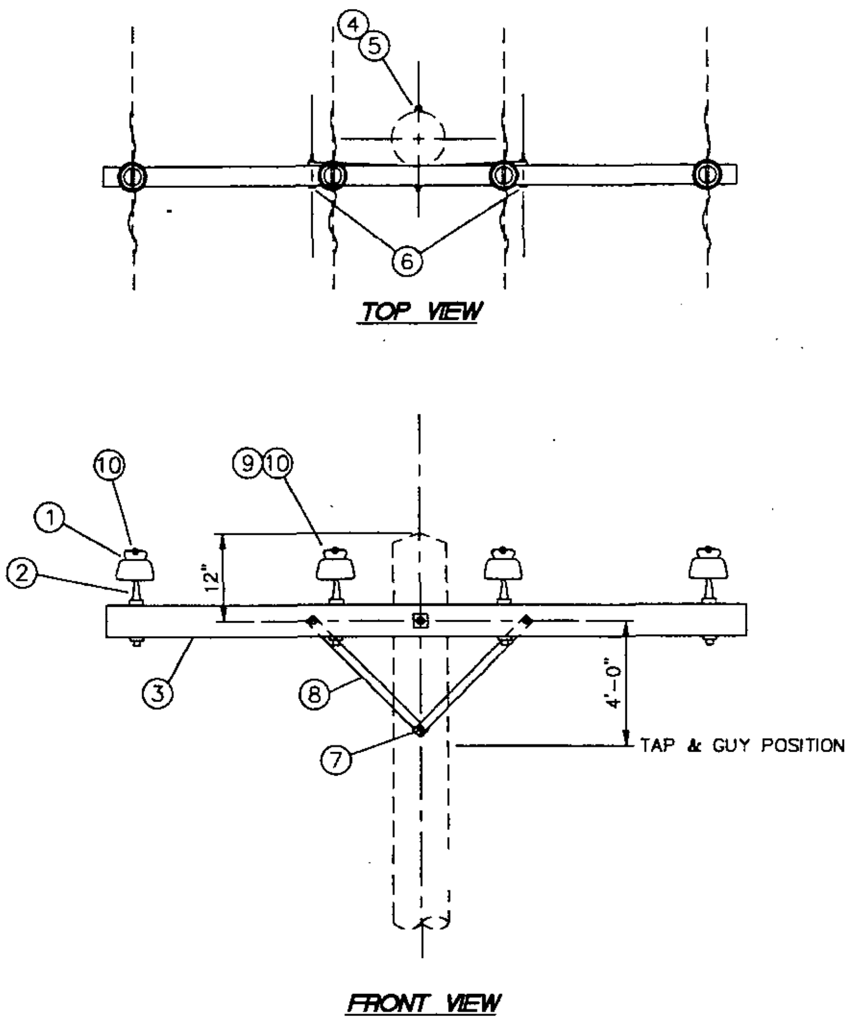
BILL OF MATERIAL						
KEY	ITEM	DESCRIPTION	O	C	QTY	STOCK NUMBER
A		8' CROSSARM		X	1	11-01-101
B		PIN INSULATOR		X	3	09-01-101
C		INSULATOR PIN 5/8" WITH NUTS AND WASHER		X	3	07-02-103
E		FLAT WASHER 5/8" x 2"		X	3	07-11-100
J		WASHER HEAD BRACE BOLT		X	2	07-05-100
L		CROSSARM BRACE (#2)		X	1PR	11-02-101
M		MACHINE BOLT 5/8" WITH NUT		X	2	07-05-102 THRU 111

NO	DATE	REVISIONS AND RECORD OF ISSUE	BY	CHK	APP	FLM

CITY OF COLUMBIA, MISSOURI
DISTRIBUTION ASSEMBLIES

ENGINEER DC	DRAWN TC	3PH TANGENT ASSEMBLY	B1-2
CHECKED 2-10-00	DATE 2-10-00		

C1-NC



MATERIAL LIST

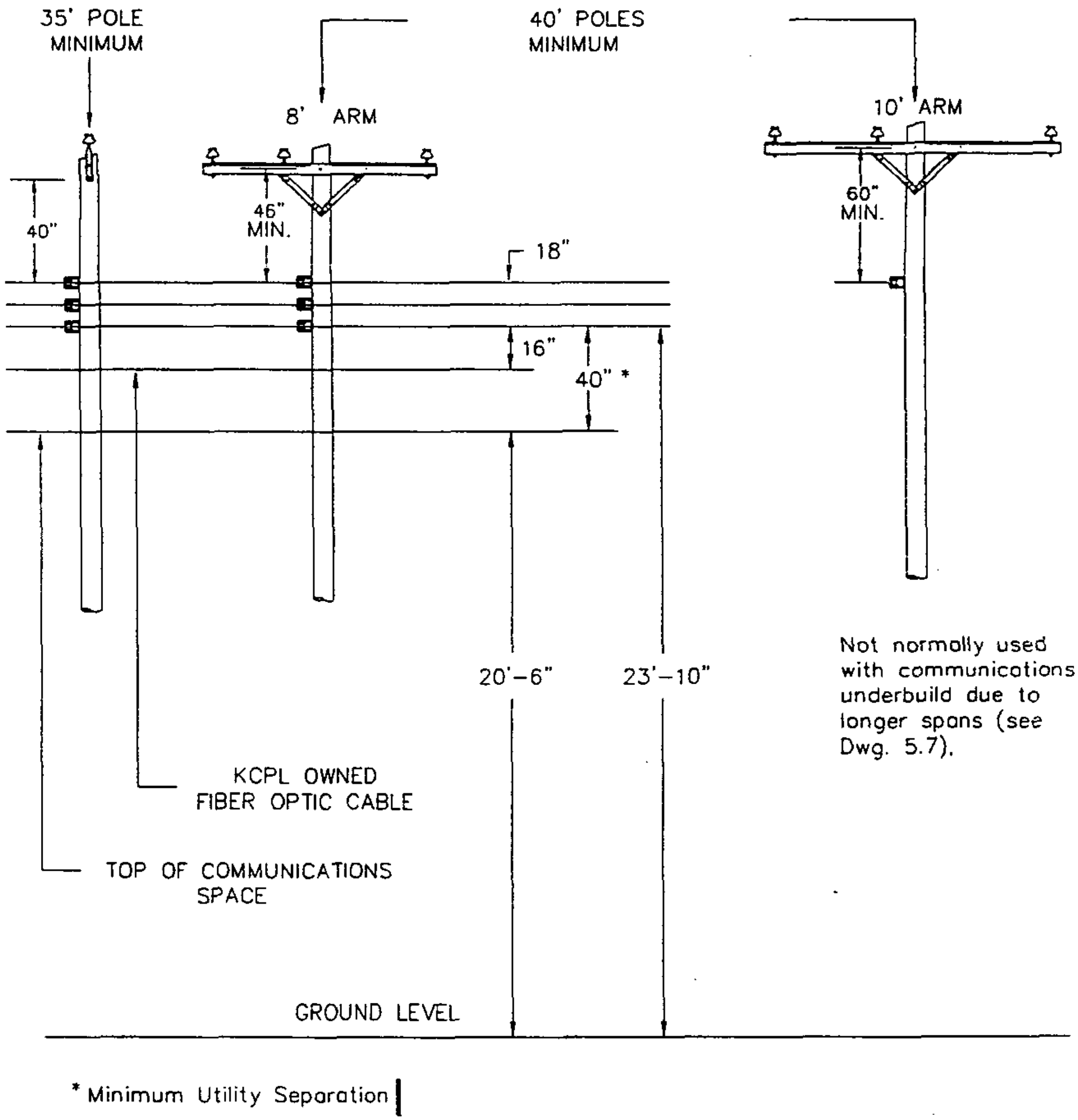
O	QTY.	DESCRIPTION	STOCK NO.	O	QTY.	DESCRIPTION	STOCK NO.
1.	3	INSULATOR 15 kV.	104150				
2.	4	STEEL CROSSARM PIN.	102286				
3.	1	CROSSARM, WOOD 8 PIN.	105015				
4.	3	WASHER 2" x 2" x 5/8" FLAT.	102439				
5.	2	MACHINE BOLT 5/8" x REQUIRED LENGTH.	1020XX				
6.	2	CARRIAGE BOLT 3/8" x 6".	102050				
7.	1	LAG SCREW 1/2" x 4".	102350				
8.	1pr	WOOD BRACE.	105029				
9.	1	INSULATOR 5 kV WHITE.	104140				
10.	4	APPROPRIATE CONDUCTOR TIE.					

△ GENERAL NOTES

13.2 KV PRIMARY
10' CROSSARM
38" X 18" BRACE

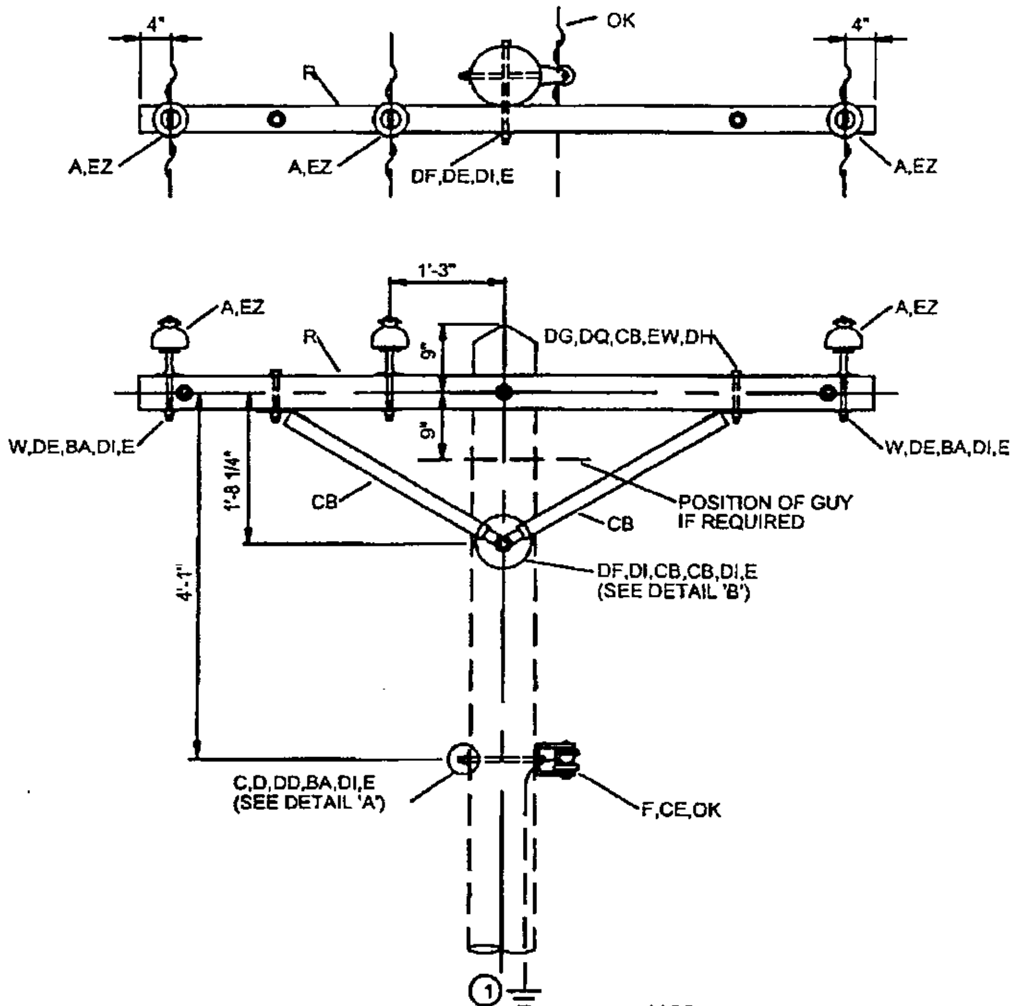
ELECTRIC CONSTRUCTION STANDARD
CITY UTILITIES OF SPRINGFIELD MO.

DRAWN BY: D.H.	3 PHASE CROSSARM TANGENT NON COMMON NEUTRAL
REV BY: D.H.	
FILE: C1-NC	
APPROVED:	REVISED: 6/20/94 — SHEET 1 OF 1 — STD. NO. C1-NC



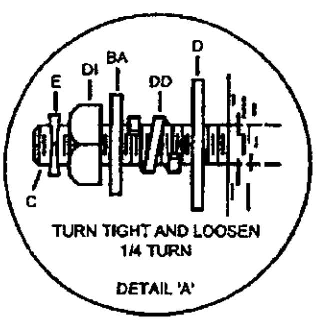
REFER TO DRAWING 5.8
FOR MAXIMUM SPANS

BASIC SPACING
FOR
UNSHIELDED DISTRIBUTION
12.47/7.2kV & 13.2/7.6kV

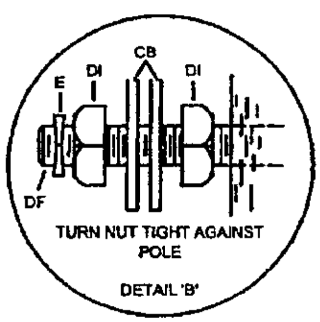


NOTE:

(1) SEE 800 SERIES UNITS FOR GROUNDING INSTALLATIONS.



DETAIL 'A'



DETAIL 'B'

PIN AND INSULATOR INFORMATION

SYSTEM VOLTAGE	INSULATOR VOLTAGE	INSULATOR PIN HEIGHT
12.4 KV	7.5 KV	5"
13.8 KV	15 KV	6"
24.9 KV	25 KV	7 7/8"

ITEM	QTY.	MATERIAL - 301	STOCK NO.
A	3	INSULATOR, PIN TYPE, LOW VOLTAGE, REQUIRED SIZE (SEE TABLE)	1444-00
C	1	BOLT, MACHINE, STEEL, GALV., SQUARE HEAD, W/NUT, 5/8"	2083-10
D	1	WASHER, SQUARE, GALVANIZED, 11/16" HOLE, FOR A 5/8" BOLT	2966-0962
E	3	NUT, LOCK, SQUARE, MACHINE BOLT, GALVANIZED, 5/8"	2553-4062
F	1	BRACKET, SECONDARY, CLEVIS, 3 1/4" X 4"	1115-2110
R	1	CROSSARM, SINGLE, WOOD, 4 PIN, 3 1/2" X 4 1/2" X 8'	1288-0830
W	3	PIN, STEEL, LOW VOLTAGE, 5 3/4" SHANK, 5/8" (SEE TABLE)	2645-000
BA	1	WASHER, ROUND, GALVANIZED, 5/8"	2966-0762
CB	1 PR	BRACE, CROSSARM, WOOD, 1 5/8" X 2 1/4" X 35"	1109-0035
CE	1	INSULATOR, SPOOL, SECONDARY, 4000#, 3 3/16"X3", 2 1/16" NECK	2446-4000
DD	1	WASHER, DOUBLE COIL SPRING, LOCK, GALVANIZED, 5/8"	2966-0562
DE	4	WASHER, LIP, TAPPED, GALVANIZED, 5/8"	2966-0262
DF	2	BOLT, MACHINE, STEEL, GALV., WASHER HEAD, W/SQ. NUT, 5/8"	2084-10
DG	2	BOLT, MACHINE, STEEL, GALV., WASHER HEAD, W/SQ. NUT, 1/2"X6"	2084-0812
DH	2	NUT, LOCK, SQUARE, MACHINE BOLT, GALVANIZED, 1/2"	2553-4050
DI	1	NUT, SQUARE, GALVANIZED, 5/8"	2553-5062
DQ	2	WASHER, LIP, TAPPED, GALVANIZED, 1/2"	2966-0250
EW	-	NUT, SQUARE, GALVANIZED, 1/2", SUPPLIED W/BOLT	2553-5050
EZ	3	TIE, TOP, DISTRIBUTION, REQUIRED SIZE	2945-
OK	1	TIE, SPOOL, 2 1/16" NECK, REQUIRED SIZE	2951-2
		5/8" STEEL CROSSARM PIN COMES WITH FLAT	
		ROUND WASHER, SQUARE NUT, AND LOCK NUT	

Missouri Public Service

WestPlains Energy

CONSTRUCTION STANDARDS
-UNIT-
301

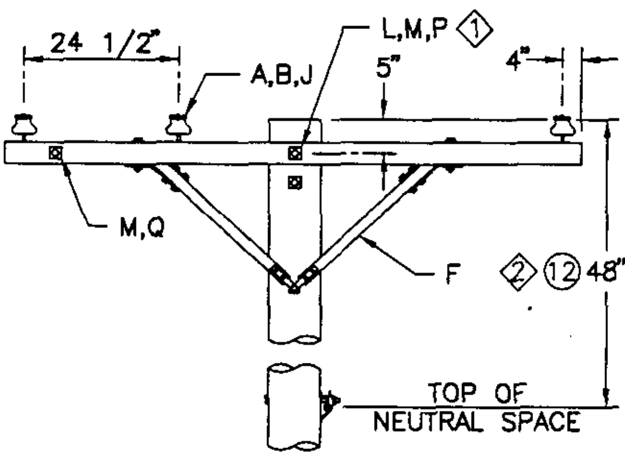
PRIMARY SYSTEM, 3 PHASE, GROUNDED WYE, TANGENT, 0° - 5° ANGLE

MPS	5/94	ST	1=16
Prepared By	Date Approved	Approved	Scale

C7435
PAGE 2 OF 2

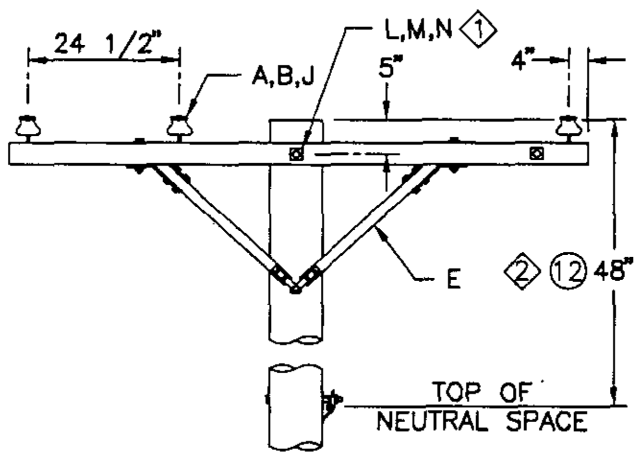
3-PHASE LINE POLE

SINGLE CIRCUIT
13.8kV AND BELOW SYSTEMS
MAXIMUM SPAN 200 FEET



C7435.B_O ② ⑪

LINE POLE, DOUBLE ARM, WITHOUT ARRESTERS

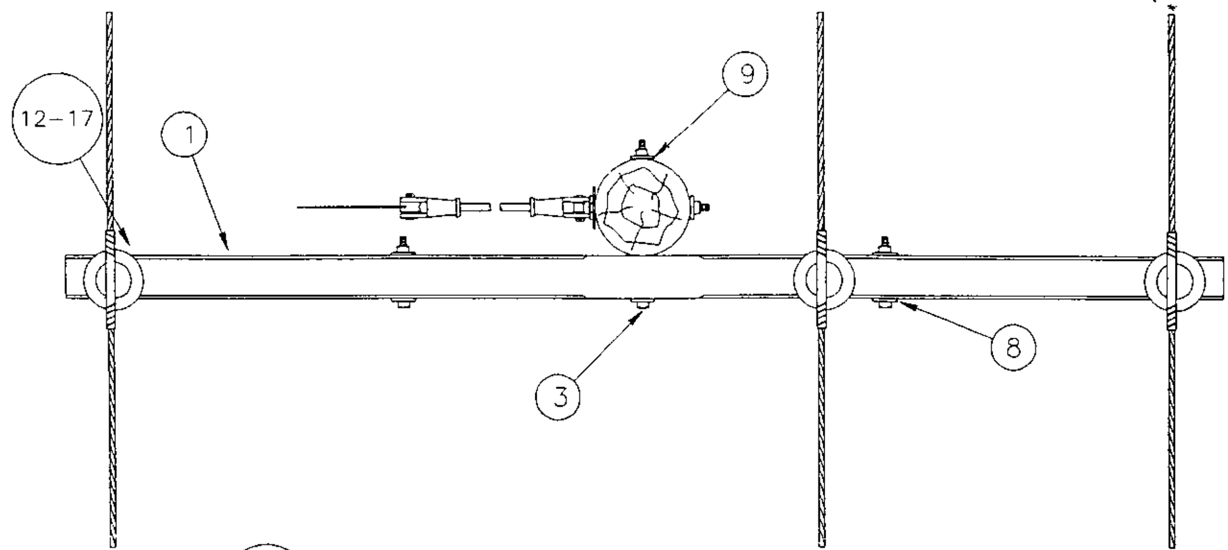


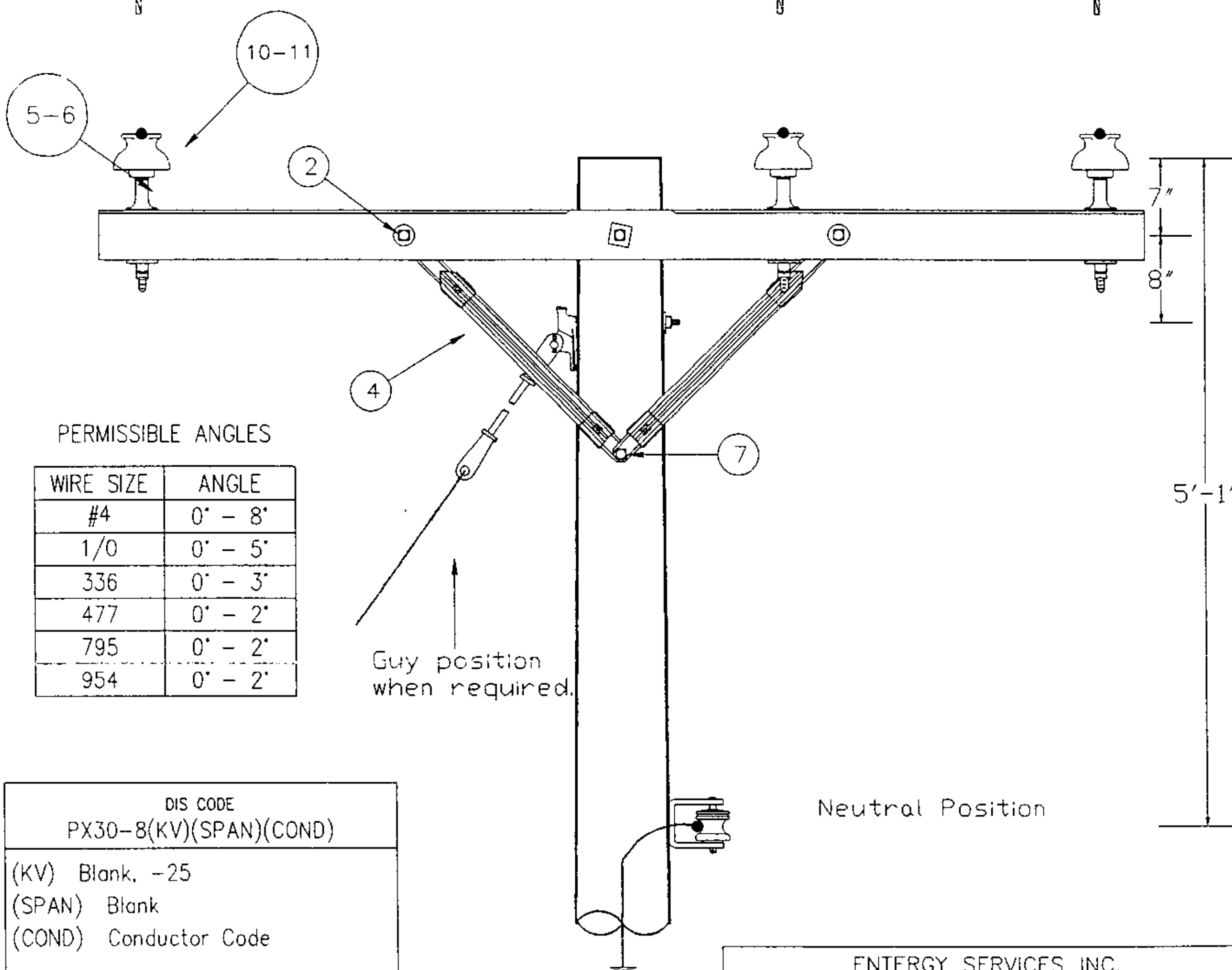
C7435.C_O ② ⑪

LINE POLE, SINGLE ARM, WITHOUT ARRESTERS

COMMONWEALTH EDISON CO.

ACAD





PERMISSIBLE ANGLES

WIRE SIZE	ANGLE
#4	0° - 8°
1/0	0° - 5°
336	0° - 3°
477	0° - 2°
795	0° - 2°
954	0° - 2°

DIS CODE PX30-8(KV)(SPAN)(COND)
(KV) Blank, -25 (SPAN) Blank (COND) Conductor Code

ENTERGY SERVICES INC.

THREE PHASE TANGENT 8' CROSSARM

APPROVED BY:	DATE: 08-10-94
CHECKED BY: WGS	SCALE: 1" = 1'-4"
DRAWN BY: BT	
ENTERGY	No. DAS00321
	PLOT 1=16 / SH. 1 OF 1

NO.	DATE:	REVISION	BY:	APPR:

PHOTO 1

Ridge-pin pole framing, 8' arm.
Ameren currently relies overwhelmingly on this design, with the B phase attached to a pole-top ridge pin. This design costs more to build than flat design in both hardware and labor, and is rarely justified in cities. It should be restricted to rural areas where spans are unusually long and/or subject to transverse winds.

PHOTO 2

Flat pole framing, 8' arm.
Ameren has a flat design in its standards book and some linemen use it. Placing the B phase on an arm pin saves money, as arm pins cost less than ridge pins and require fewer fasteners. Flat design also offers various engineering advantages in cities and should be Ameren's preferred standard in its urban St. Louis 4-kV zone, and in cities and towns in its 12-kV zone.

PHOTO 3

Extension clevises for secondaries. In its St. Louis Local 1439 territory, Ameren now uses extension clevises and racks almost exclusively. These inflate construction costs and are rarely warranted. Perhaps no other utility in the nation relies so heavily on these. Ameren should limit their use to special circumstances where there exists a legitimate reason for holding the secondaries out from the pole.

PHOTO 4

Standard clevises for secondaries.
In its St. Louis Local 1439 territory, Ameren essentially stopped using standard clevises and clevis racks some years ago. These devices mount flush to the pole and cost less than extension clevises and racks. Most utilities use these exclusively or nearly exclusively. So should Ameren.

PHOTO 5

PVC conduit for 4-kV stingers.
In its St. Louis Local 1439 territory, some Ameren linemen attach PVC tubes to poles and arms to enclose stinger wires that deliver power from the primaries to the transformers. This pole is typical, with a total of 3 tubes – 2 horizontal tubes on the lower arm and a big vertical tube on the pole enclosing the stingers. Had this been a 12-kV pole, the crew could not have used tubes. Because these transformers are properly located between the primaries and secondaries, the crew should have used flying taps rather than tubes and saved money.

PHOTO 6

Flying taps for 4-kV stingers.
Some linemen in the Local 1439 territory are correctly using flying taps rather than conduit. Perhaps they transferred in from 12-kV Ameren districts where use of conduit is unheard of. This crew got it right, using low-cost flying taps to deliver power to the transformers. Every effort should be made to design poles to avoid conduit.

PHOTO 7

PVC conduit –
Improper transformer placement.
A crew installed this transformer on the wrong side of the pole, causing the bushing to point away from the intended primary. To remedy the situation, a PVC tube was attached to the crossarm to lead the stinger from east to west. Proper planning could have avoided the need for this conduit.

PHOTO 8

Flying tap –
Proper transformer placement.
A crew installed this transformer on the correct side of the pole, allowing for a low-cost flying tap to deliver power to the transformer. The bushing is aimed correctly at the intended primary.

PHOTO 9

PVC conduit –
Improper transformer placement.
A crew improperly placed this transformer below the secondaries, thus necessitating a long section of conduit to carry the stinger through the secondaries. A waste of money, and ugly, too. Every effort should be made to place transformers between primaries and secondaries, thus eliminating the need for conduit.

PHOTO 10

Flat pole framing, pole top obstructed. Flat design is safe and widely employed in the electric industry, and often must be used due to special circumstances. Here, guy wires anchored to the pole top make the use of a ridge pin impossible. If Ameren linemen can safely place the B phase on the arm in this situation, they obviously can do this in other situations, too. This design is not dangerous or onerous.

PHOTO 11

Flat underbuilt circuit, 8' arm.
Again, flat framing is sometimes the only design option available to crews due to special circumstances. Here, the 4-kV distribution circuit is underbuilt below a 69-kV circuit. Of course, the underbuilt arms on the tall poles have to be flat, but for practical design-consistency reasons, the arms on the short, interset 4-kV poles need to be flat, too, and Ameren crews do this routinely without difficulty. Again, if they can safely place the B phase on the arm in this situation, there's no reason why they can't do this all the time.

PHOTO 12

Flat underbuilt circuit, 10' arm.
Again, flat framing is sometimes the only design option available to crews due to special circumstances. Here, the 4-kV distribution circuit is underbuilt below a 69-kV circuit. Of course, the underbuilt arms on the tall poles have to be flat, but for practical design-consistency reasons, the arms on the short, interset 4-kV poles need to be flat, too, and Ameren crews do this routinely without difficulty. Again, if they can safely place the B phase on the arm in this situation, there's no reason why they can't do this all the time.