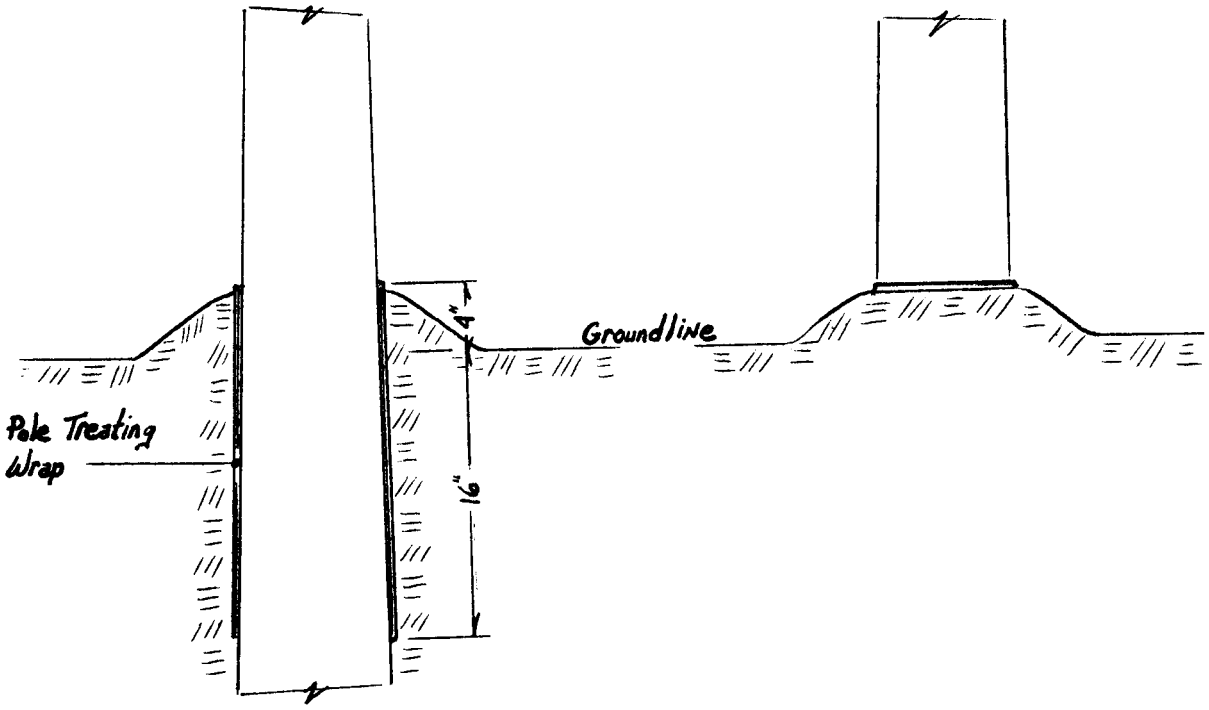
This wrap should be applied in the following manner to all poles that: (1) have had the earth around the pole substantially disturbed, (2) are being relocated or reused, (3) on any terminal pole, and (4) on any pole being set in pavement.



INSTRUCTIONS:

1. Remove all dirt, foreign material and loose or decayed wood from the pole in an area extending 6” above and 24” below the groundline by scraping and wire brushing.
2. Measure the circumference of the pole.
3. Cut from the roll of pole treating wrap the length needed allowing an additional 4” for overlap.
4. Apply wrap to the pole to the depth of approximately 16” below groundline and 4” above groundline.
5. Attach to pole by means of staples. Be sure wrap is pulled tight to be in close contact with the wood pole.
6. Back fill and tamp the earth around the pole to the top of the wrap or to base of paved surface if set in pavement.
7. Nail one of the aluminum date tags supplied with the wrap to the pole near the brand.

CAUTION

Gloves should be worn when handling this product, the same as for any chemical preservative, since contact can cause skin irritation. Scraps of this wrap and empty containers should be buried at the base of the pole hole.

		Stnd. / Stk. No.	Description 02 30 07 00	Qty.
–▶		41 56 114	Wrap, Pole Treating, 20” WD (25’ Roll)	1*
		999	Operation Code	5

*Length of wrap required depends on pole diameter at ground line.

1. GENERAL

Woodpeckers can cause significant damage to wood utility poles. The damage ranges from cosmetic, such as sounding and food cache holes, to serious, such as nesting holes. Left unrepaired these nesting holes can cause an early end to the pole life through wood decay.

1.1 Hole Size

When evaluating a pole as a candidate for repair it is important to note the size and extent of the woodpecker hole. Small (golfball size) and medium (baseball size) holes have the least effect on pole strength. Large (softball size) holes indicate a nesting cavity which is the major cause of pole strength degradation due to woodpeckers.

1.2 Shell Thickness

Once a pole has been identified as a repair candidate a closer inspection is required. Nesting cavities can go as much as 24" down the inside of the pole from the entrance hole. In addition, the outer shell of the pole can be thinned out, compromising the strength at that location. Repair candidates must have at least 3" of outer shell in order to be repaired. Any pole with less than 3" shell thickness should be replaced. A check of the shell thickness may require drilling a 7/16" hole in the side of the pole in the cavity area and using a shell thickness gauge (Stock No. 85–20–051).

2. INSPECTION

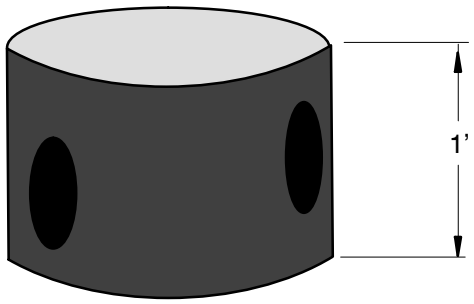
2.1 Emergency Reject Poles

Emergency reject pole is identified as pole with excessive woodpecker damage that will cause imminent failure.

2.2 P1 Reject Pole

P1 reject pole is identified as pole with any size woodpecker hole that goes through the entire diameter of the pole and where light is visible from the opposite side.

P1 reject pole is also identified as any pole with 2 large woodpecker holes within a 1' band on any section of the pole.



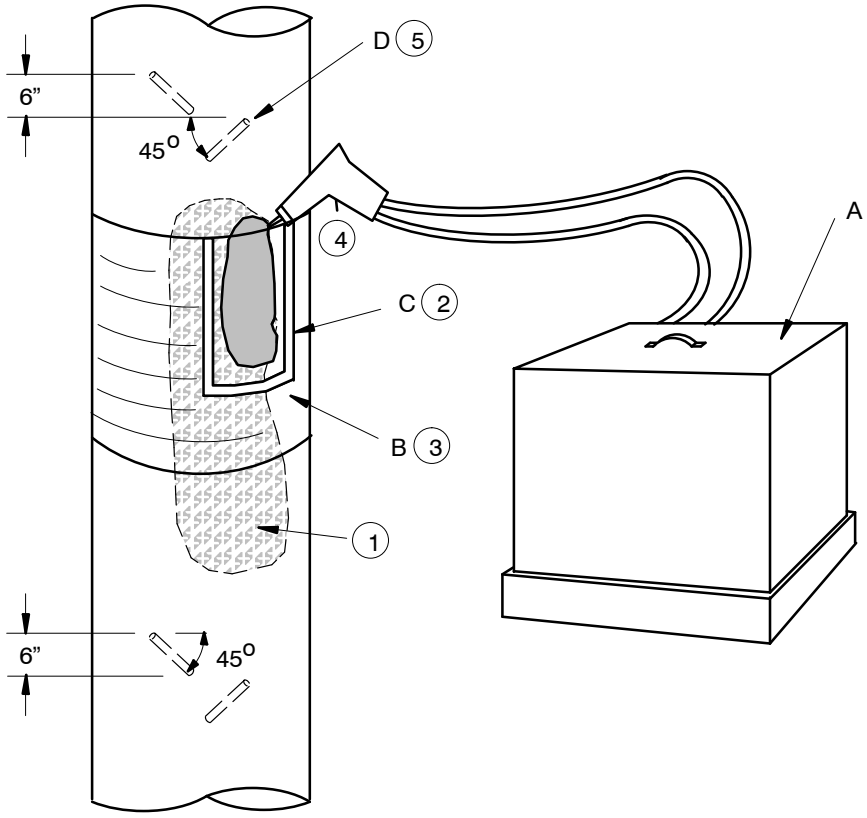
2.3 P2 Reject Pole

P2 reject pole is identified as any pole that has woodpecker damage that is affecting the pole or hardware at any attachment point.

- Single pole structure: A pole with woodpecker damage located at its loading point will reject it as a P2. The loading point is generally located at 1/3 of the total pole height from the ground. (example: a 40' pole's loading point will approximately 13.3' from the ground)
- Two pole structure: Any woodpecker damage located at the bottom cross brace connections to either pole will qualify the pole as a P2 reject.

3. REPAIR PROCEDURES

The materials and guidelines for repair of woodpecker damage on poles are shown below.



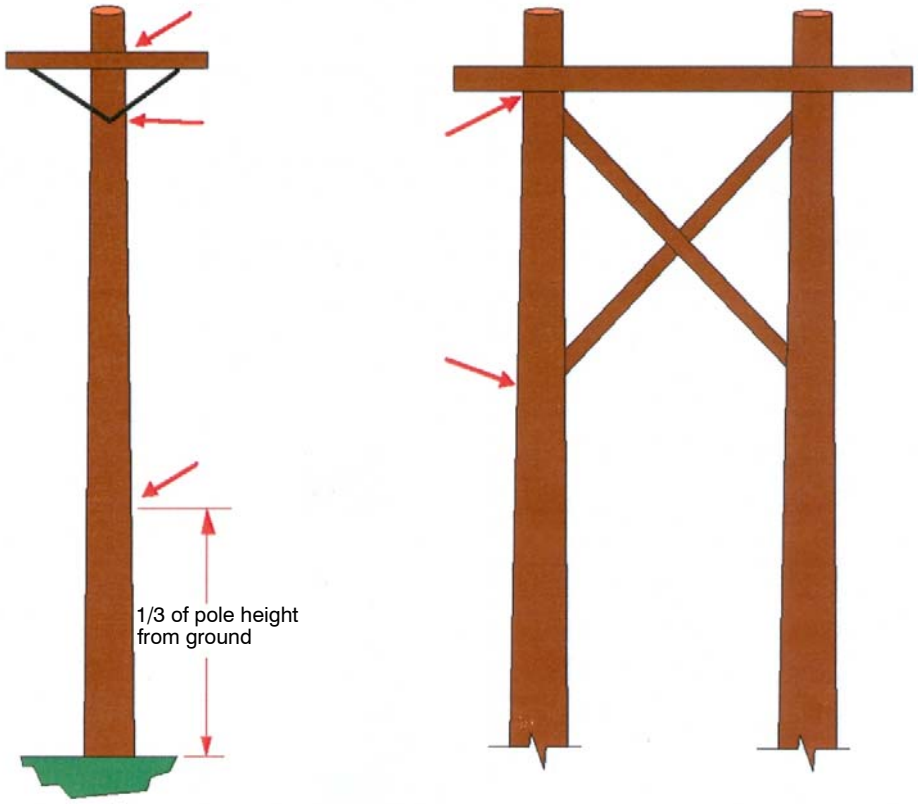
NOTES:

1. Remove debris and water from cavity.
2. Two sides and bottom of hole to be caulked to provide seal with heat resistant sheet.
3. Wrap heat resistant sheet around pole to sufficiently cover hole.
4. See manufacturer's instructions for filling.
5. Depth of holes to be ~2–1/2 times the radius of the pole. Locate holes 90° apart on pole face.
6. Pressurized aerosol can insulation is not an acceptable filler.

		Stnd. / Stk. No.	Description 02 00 09 01	Qty.
	A	31 53 091	Compound, Woodpecker Hole Rep.	1
	B	24 57 116	Sheet, Heat Resistant	1
@	C	30 52 110	Caulk, Latex, 110 oz. Tube	As Req'd.
	D	30 60 144	Fumigant, Boron Rod, w/Plug	4
		OP905	Repair Pole, Woodpecker Damage	1

4. REPLACEMENT/INSTALLATION

Ameren practice has been to replace existing rejected pole with wood poles adding repeated cost for a temporary fix. Standards recommends all divisions use composite poles for woodpecker pole replacement. Standards also recommends the use of composite pole for all areas plagued with wood pecker problems.



1. General

This instruction covers methods to be used in inspecting and testing standing poles. The purpose of this inspection and test is to determine whether a pole is essentially sound and has adequate strength for the existing circuits or contemplated additions; or if it is decayed or damaged to the extent that it should be replaced. The inspection and test shall be accomplished by visual examination, sounding and boring of the pole above ground and a detailed ground line examination.

2. Poles Subject To Inspection

All poles encountered during the course of normal estimating activities on which any new or additional equipment is to be installed shall be inspected and tested, regardless of the age of the pole.

3. Pole Strength

Rot or decay, insect damage and mechanical damage are the major factors that reduce pole strength and necessitate pole replacement.

a. Rot Or Decay

Rot or decay is a breakdown of the wood fibers caused by fungi. As a result of rot, wood loses its structure, weight and strength. Rot normally occurs to the greatest extent at or about six (6) inches below the ground line and may attack the pole either internally or externally. Internal rot is termed "Heart−Rot" and external rot is called "Shell−Rot".

Decay in pressure treated Southern Pine or Douglas Fir poles will normally originate in the internal wood. Consequently, when inspecting these poles more emphasis should be placed on the detection of interior decay.

Decay in butt treated, Cedar poles will usually occur first in the section at or near the ground line. This decay will be found in season checks and in the untreated wood just beneath the treated layer.

b. Insect Damage

Insect damage is the result of an attack of termites or other wood consuming insects. These insects may honey comb the wood to the extent that practically all the strength of the pole is lost. Although this type of damage occurs less frequently than rotting, the effects are equally as serious. All poles, regardless of species, are subject to insect damage.

c. Mechanical Damage

Mechanical damage most frequently results when a pole is struck by an auto or other peice of equipment capable of producing severe impact. Also included is damage from fire or other mechanical contact which results in a reduction of the cross−section of the pole.

4. Inspecting and Testing Procedure

Inspection and testing shall be performed as outlined in the following paragraphs. A sketch showing various defects found in poles and illustrating the testing procedure is included in Appendix I, Appendix II, and Appendix III.

4.1 Above Ground Line Inspection

All poles subject to inspection and test shall undergo an above ground line inspection.

a. Visual Inspection

The pole shall be visually examined and the species, length, class, date of manufacture, and original treatment noted. All sides of the pole shall be inspected for evidence of injuries, splits, cracks, loose wood, rot and insect damage. Any of these defects may be cause for rejection depending on the extent

of the damage.
Care must be taken in evaluating evidence obtained through visual inspection. For example, checks should not be confused with mechanical injury. All poles are subject to season checking which is a separation of the wood parallel to the fibrous structure or grain. Checks will open and close depending on the moisture content of the wood which varies with dry or rainy seasons. Checks do not materially affect the strength of a pole and usually are not cause for replacement.

Mechanical damage may or may not be cause for replacement depending on the extent of the injury. Some abrasion can be tolerated. However, if the injury has resulted in cracks (cross breaks) or splits, the pole should be replaced.

b. Sounding

The pole shall be tested for interior decay and hollow sections by striking the pole with a hammer. The pole should be sounded around its circumference, from the ground line to a point as high as can be conveniently reached from the ground.

Variations in sounds of the hammer blows will indicate hollow or decayed sections. A good pole has a solid ring, whereas one containing decay may give a hollow sound or a dull thud. However, accurate interpretation of the sound requires considerable experience and results may be misleading to the novice. For example, sounding adjacent to a check may sound like a hollow section. Loose wood, shakes, high moisture content, wood density, etc., will also produce variations in sound. When sounding a badly weathered pole it is necessary to strike several times at the same spot to compress the decayed shell so that a solid hammer blow can be struck.

c. Boring

Borings shall be made at each point on a pole where the visual inspection or sounding indicates probable interior decay. The borings should be directed toward the center of the pole and should be perpendicular to the axis of the pole.

All borings should be made with a 7/16 inch diameter bit (Stock #85−04−159) driven by a 10” hand brace (Stock #85−02−035). Careful examination of the chips will indicate the presence of decay. Any reduced resistance of the bit may indicate hollow sections. Probing in the bored holes with a tool such as a screw driver will also aid in the detection of interior rot.

All holes bored in a pole shall be plugged with 1/2 inch diameter penta impregnated plugs (Stock #41−56−105). The bored hole shall be filled with as many plugs as needed to completely fill the hole and the last one shall be cut off even with the surface of the pole.

4.2 Ground Line Inspection

Any poles suspected of having decay on the basis of the above ground examination or for other reasons, shall also undergo a ground line inspection. Since rot or decay most frequently occurs first at or about six (6) inches below the ground line this is the area where inspection is most important.

a. Shell Rot

The pole shall be excavated to a depth of about twelve (12) inches at any suspicious point such as a wide check or, if none, at any convenient portion of its circumference. One spade full of earth will normally suffice. If shell rot is apparent, the excavation shall be continued around the entire circumference of the pole to determine the extent of the decay. If no decay is apparent, a flat−head screw driver shall be thrust gently into the pole so as not to pierce deeply into the wood. (If the wood is sound, a deep incision would expose internal wood beneath the thin, outer, protecting layer of treated wood.) However, if decay is sus-

pected, more vigorous probing may be necessary to determine the extent of the decay.
If decay is discovered, all loose and rotted wood shall be scraped away and the circumference of the remaining sound wood measured. If the extent of decay exceeds the limits set forth in Appendix II and Appendix III of this standard, the pole shall be rejected.

b. Heart Rot

If after excavating and probing the pole still appears to be sound, borings shall be made as follows:

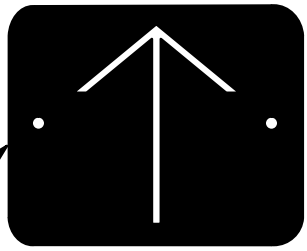
One (1) boring shall be made at about six (6) inches below the ground line of the pole. The boring should be directed downard an about a 45^{o} angle toward the center of the pole. If any evidence of interior rot is found, two additional borings shall be made at points equally spaced around the circumference of the pole. The thickness of the shell shall be carefully measured at each of the three borings. A shell thickness gauge (Stock #85−20−051) is available for making these measurements. Only the minimum thickness need be noted and this shall be used as the basis for acceptance in accordance with limits set forth in Appendix II of this standard.

All bored holes shall be filled with as many penta impregnated plugs as necessary to completely fill the hole and the excavation shall be backfilled and tamped.

c. Poles Set In Paved Areas

Where poles are set in paved areas and excavation is impractical they shall be visually examined at the ground line for evidence of shell rot. Also, inspection for heart rot shall be made as outlined in Paragraph b above except that the borings shall be started as close to the ground line as possible.

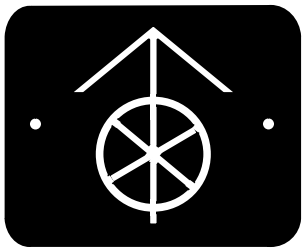
5. Marking



B
STK. NO 16–01–173

The B pole tag has a white arrow on a red background. It is intended as a warning that the pole has some defective or dangerous area but is not considered dangerous or hazardous to the point that replacement is necessary.

Woodpecker damage, pitch pockets unusually large knots are examples where this tag would be appropriate.

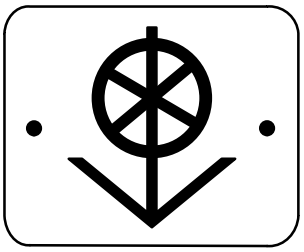


C
STK. NO 16–01–174

The C pole tag is similar to the B pole tag except that an X inscribed in a circle is imposed on the shaft of the arrow. This tag is intended for marking dangerous/hazardous poles which require replacement.

It serves as a warning that the pole is dangerous/hazardous and shall not be climbed before being temporarily supported.

Poles with severe decay (usually at ground line) would be the most common use for this tag.



D
STK. NO 16–01–325

The D tag is similar to the C tag except it is black on yellow background. This tag is intended for marking poles that are found to have defects that reduce the strength of the pole. The pole has been identified as a candidate for reinforcing.

It serves as a warning to be sure to inspect the pole and use discretion before climbing.

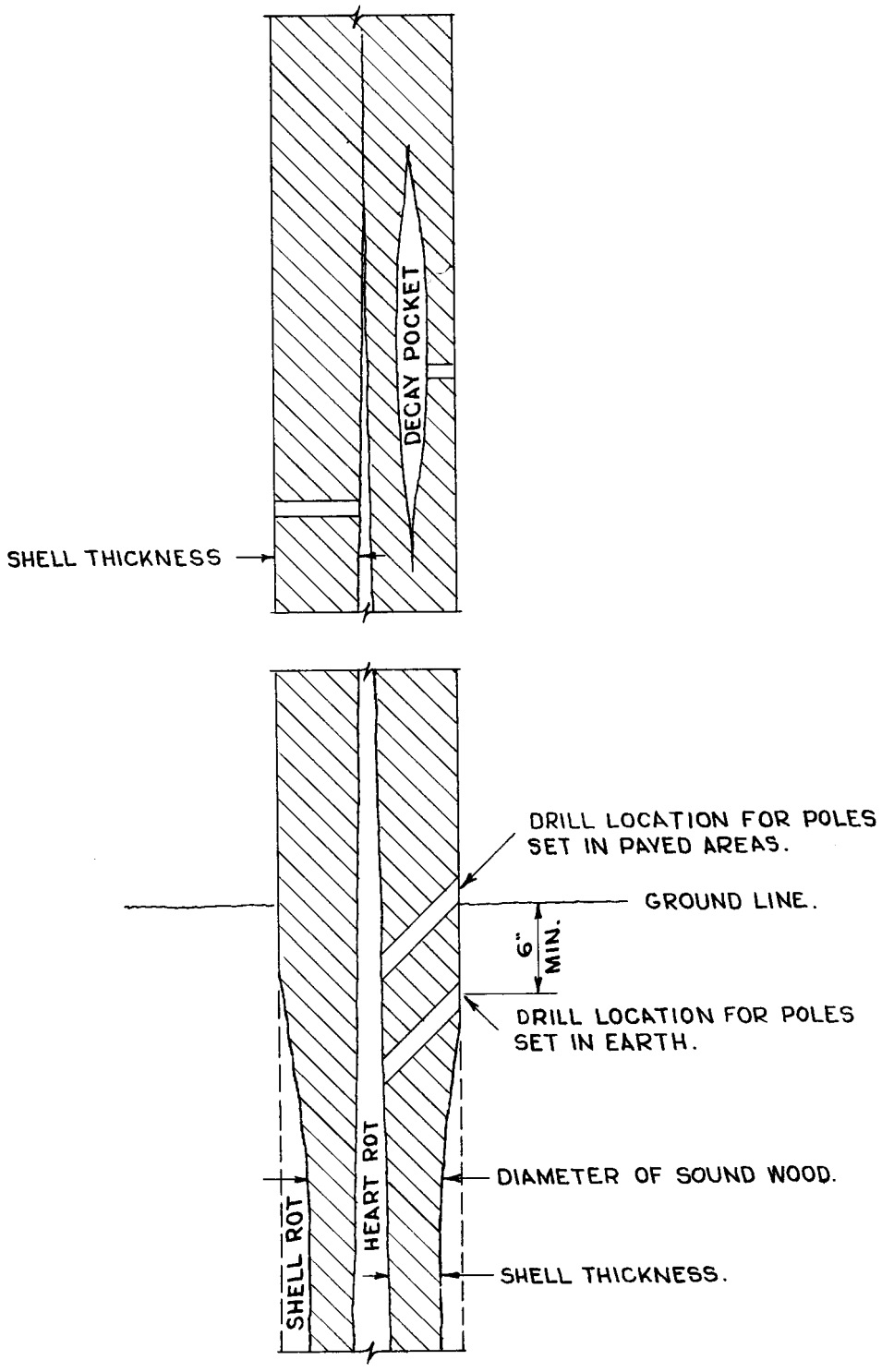
PLACEMENT OF TAGS

Place one tag on the road side of the pole approximately 6 ft. above ground line. Place another tag at the same height on field side of pole.

If the pole is defective below the tags, place the tags so that the arrow points downward. If the pole is defective above the tags, place the tags so that the arrow points upward. If the pole is defective below and above the tags, place a double set of pole tags, one pointing up, the other set pointing down.

Attach the tags with galvanized roofing nails.

APPENDIX I


DECAY POCKET
SHELL THICKNESS
DRILL LOCATION FOR POLES SET IN PAVED AREAS.
GROUND LINE.
6" MIN.
DRILL LOCATION FOR POLES SET IN EARTH.
SHELL ROT
HEART ROT
DIAMETER OF SOUND WOOD.
SHELL THICKNESS.

APPENDIX II
POLE CIRCUMFERENCE DETERMINATION
TABLE OF MINIMUM DIMENSIONS OF REMAINING SOUND WOOD

INSTRUCTIONS:

1. Determine Effective Groundline

   Circumference: General External Decay – determine average depth of decay and deduct six times the depth from the original groundline circumference of the pole.

   Hollow Heart, Exposed Pockets and Enclosed Pockets. Use appropriate tables on Appendix III to correct the original groundline circumference for specific defects.

2. Compare the Effective Groundline Circumference with the "Minimum Remaining Circumference" figure opposite the "Original Circumference" figure in the table of Minimum Dimensions. If the Effective Groundline Circumference of Remaining Sound Wood exceeds the "Minimum Remaining Circumference" figure in the table, apply treatment and backfill according to specifications. If the Effective Groundline Circumference is less than the "Minimum Remaining Circumference" figure in the table, pole is to be rejected and reported as such.

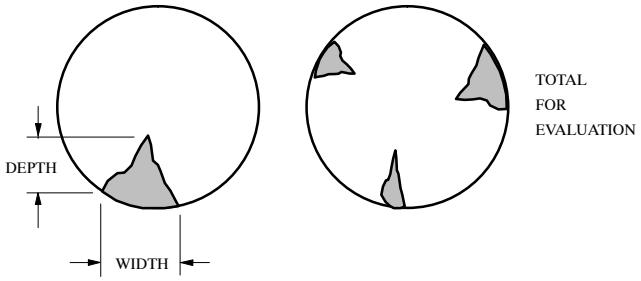
CIRCUMFERENCE INCHES	
Original Circumference*	Minimum Remaining Circumference
22	19.20
23	20.00
24	21.00
25	21.90
26	22.75
27	23.50
28	24.50
29	25.25
30	26.25
31	27.25
32	28.00
33	28.75
34	29.75
35	30.75
36	31.50
37	32.25
38	33.25
39	34.25
40	35.00
41	35.75
42	36.75
43	37.75
44	38.50
45	39.25
46	40.25
47	41.25
48	42.00
49	42.75
50	43.75
51	44.75
52	45.75
53	46.25
54	47.25
55	48.00

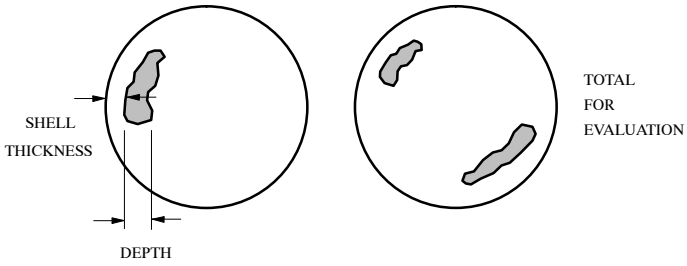
*NOTE: Per ANSI 05.1.

APPENDIX III

POLES WITH EXPOSED POCKETS Deductions to be made from measured circumference in inches to obtain circumference of equivalent solid pole.								
Depth of Pocket in Inches	Width Of Pocket In Inches							
	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
1.0	1	1	2	2	3	3	4	5
2.0	1	2	3	4	5	6	7	8
3.0	1	2	4	5	6	8	9	11
4.0	2	3	4	5	7	9	10	11
5.0	2	3	4	6	7	9	11	–

POLES WITH ENCLOSED POCKETS Deductions to be made from measured circumference in inches to obtain circumference of equivalent solid pole.				
Measured Circumference of Sound Wood In Inches	Thickness of Shell on Thin Side in Inches	Maximum Depth of Pocket In Inches		
		3.0	4.0	5.0
22–30	1.0	2	2	3
22–30	2.0	–	1	1
22–30	3.0	–	–	–
31–38	1.0	2	3	3
31–38	2.0	1	1	2
31–38	3.0	1	1	1
39–55	1.0	2	3	4
39–55	2.0	1	2	2
39–55	3.0	1	1	1



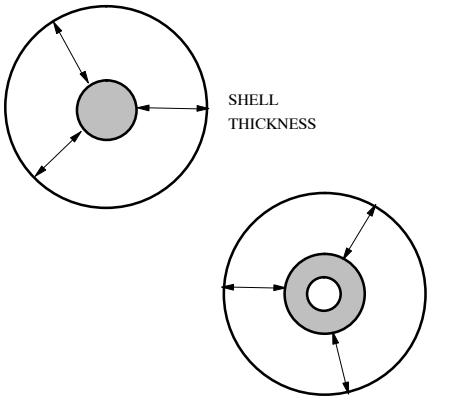


When more than one pocket or defect add; deduct for each defect and use total deduction for evaluation.

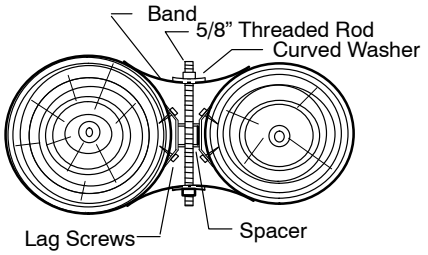
If the shell thickness over an enclosed pocket is less than 1/2” consider it an exposed pocket.

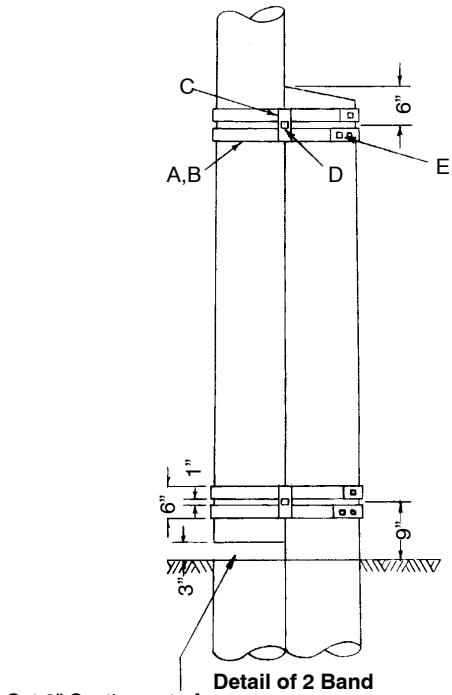
If the enclosed pocket extends more than half–around the pole consider it as hollow heart.

APPENDIX III

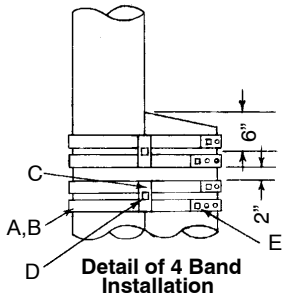


POLES WITH HOLLOW HEARTS Deductions to be made from measured circumference in inches to obtain circumference of equivalent solid pole.							
Measured Circumference Of Sound Wood Of Hollow Pole In Inches	Minimum Thickness Of Shell In Inches*						
	2.0	2.5	3.0	3.5	4.0	4.5	5.0
22	1	1	-	-	-	-	-
23	1	1	-	-	-	-	-
24	1	1	-	-	-	-	-
25	1	1	-	-	-	-	-
26	1	1	-	-	-	-	-
27	1	1	1	-	-	-	-
28	1	1	1	-	-	-	-
29	1	1	1	-	-	-	-
30	2	1	1	-	-	-	-
31	2	1	1	1	-	-	-
32	2	1	1	1	-	-	-
33	2	1	1	1	-	-	-
34	2	1	1	1	-	-	-
35	3	2	1	1	1	-	-
36	3	2	1	1	1	-	-
37	3	2	1	1	1	-	-
38	3	2	1	1	1	1	-
39	3	2	1	1	1	1	-
40	4	2	2	1	1	1	-
41	4	3	2	1	1	1	-
42	4	3	2	1	1	1	1
43	4	3	2	1	1	1	1
44	5	3	2	1	1	1	1
45	5	3	2	2	1	1	1
46	5	4	2	2	1	1	1
47	6	4	3	2	1	1	1
48	6	4	3	2	1	1	1
49	6	4	3	2	1	1	1
50	6	4	3	2	2	1	1
51	7	5	3	2	2	1	1
52	7	5	4	2	2	1	1
53	7	5	4	3	2	1	1
54	8	6	4	3	2	1	1
55	8	6	4	3	2	2	1
*Poles with hollow heart which have a minimum shell thickness of less than two (2) inches should be replaced.							





Detail of 2 Band Installation



Detail of 4 Band Installation

NOTES:

1. The stub pole shall be set at the depth shown in DCS 02 for the class and height of the line pole being stubbed.
2. Stubbing of poles shall be confined to tangent lines.
3. The pole stub shall be set to assume the transverse loading on the pole.
4. The pole classes and number of bands shown will develop the full strength of the line pole. Pole classes greater than shown if fully loaded would exceed the strength of the bands.
5. Pole stubbing is a temporary repair. Steel c–truss reinforcement or pole replacement are considered permanent repairs.
6. Saddle spacer is included with items A and B.

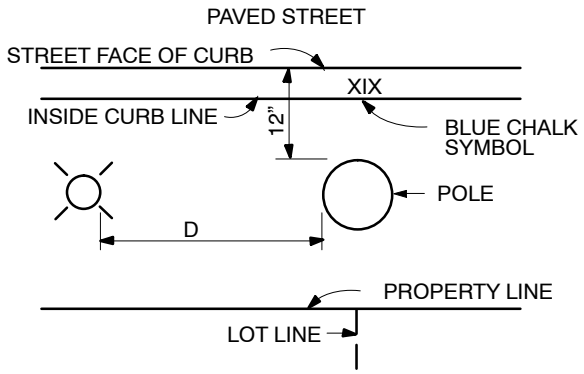
	Stnd. / Stk. No.	**Description 02 30 44 ****	**01**	**02**	**03**	**04**
			2 Band		**4 Band**	
*A	23 67 007	Band, Pole Reinf., 2–1/2" x 96"	4		8	
*B	23 67 006	Band, Pole Reinf. 2–1/2" x 72"		4		8
C	23 67 164	Pipe, Reinf., 2" x 6"	4	4	8	8
D	23 52 068	Bolt, Mach., 5/8" x 16"	2	2	4	4
E	23 60 007	Screw, Lag, 1/2" x 4"	4	4	8	8
F	903	Stub Pole	1	1	1	1

*Estimator shall determine in field the proper length of reinforcing band required.

LINE POLE		STUB POLE		
LENGTH (FEET)	CLASS	LENGTH (FEET)	MIN. DIA. (INCHES)	BANDS NO. REQ'D
35	4	12	11	4
35	1 and 3	12	13	8
40	4	13	11	4
40	1, 2, and 3	13	13–1/2	8
45	1, 2, 3, and 4	13	14	8
50	1, 2, and 3	15	15	8

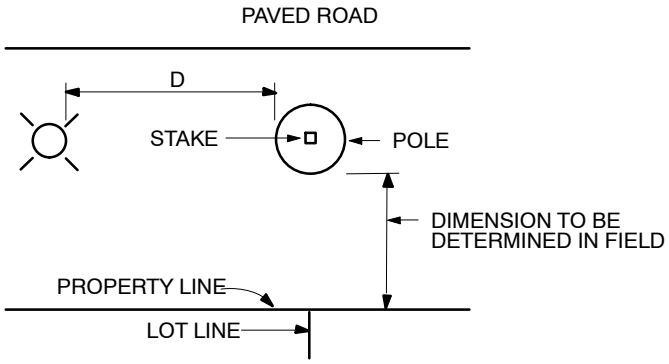
For Street Light D = 5 ft. minimum

For Fire Plug D = 3 ft. minimum,
4 ft. preferred



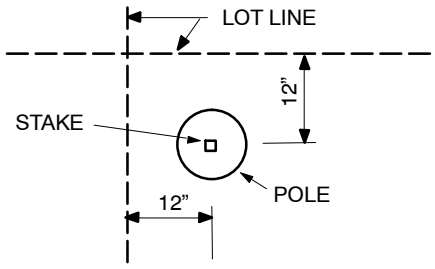
ON STREETS WITH CURBS

The symbol shown to the left shall be marked on the curb with blue chalk. Pole shall be set so that face of pole is 12 in. from street face of curb.



ON ROADS WITHOUT CURBS

Stake is normally set 5 ft. from property line but this dimension varies considerably depending on circumstances so each case should be determined in field. Set stake on center of pole location.



ON PRIVATE PROPERTY

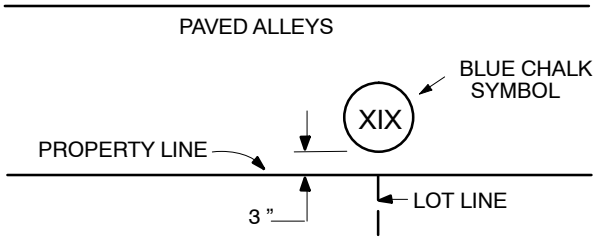
Set stake in center of pole location 12 in. from both property lines.

ON PRIVATE PROPERTY

The following stakes are available:

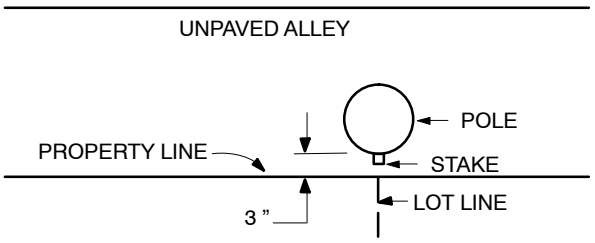
Size Stake	Stock No.
1–1/4" x 1–1/8" x 22"	41–56–052
1–1/4" x 1–1/8" x 12"	41–56–051

CAUTION: Where there is danger of pedestrians tripping stakes must be driven flush with ground.



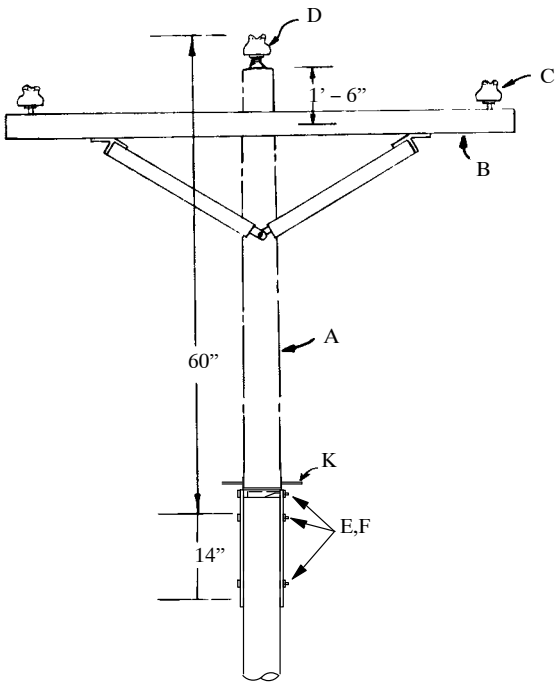
IN PAVED ALLEYS

In paved alleys where stakes cannot be driven the symbol shown to the left shall be marked on the pavement with blue chalk. Pole shall be set so that face of pole is 3 in. from property line.

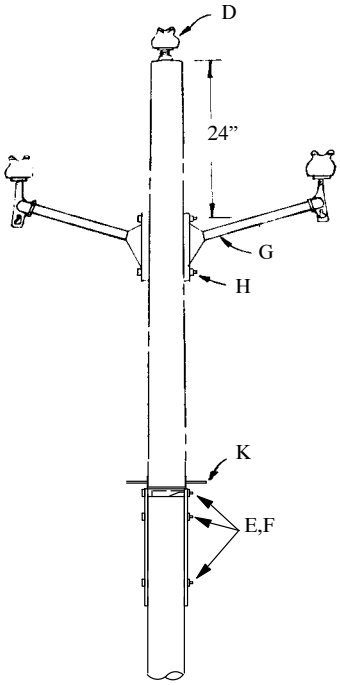


IN UNPAVED ALLEYS

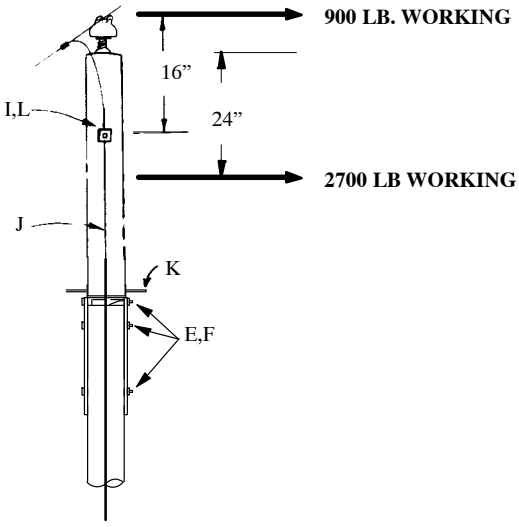
Set stake so that the side against pole will be 3 in. from property line. Mark stake with yellow chalk on side facing pole.



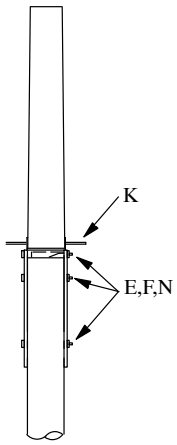
02 00 50 01
WOOD ARM CONSTRUCTION



02 00 50 02
FIBERGLASS ARMLESS CONSTRUCTION



02 00 50 03
STATIC WIRE



02 00 50 04
NO RIDGE PIN

NOTES:

1. Mounting holes are predrilled for these configurations. Other configurations must be field drilled.
2. Extension base adjusts to fit 6" to 12" pole diameters.

3. Extension is stronger in bending than a class one pole. Line angles are limited by configuration or hardware mounted on the extension.
4. For guying use pole band 23 77 111 and band link 23 68 074.
5. Adding extension reduces pole class by one class, ie. A 35' Class 3 becomes a 40' Class 4.
6. Install double arming bolt through one of the fiberglass mounting holes to be used as a pole step.
7. Clamp ground wire between extension and curved washer is shown.

		Stnd. / Stk. No.	**Description**	**01**	**02**	**03**	**04**
	A	41 06 174	Extension, Pole Top w/ Ridge Pin	1	1	1	
		41 06 214	Extension, Pole Top w/o Ridge Pin				1
@	B	**04 00 20 02**	Crossarm, 8', Single	1			
		04 00 20 03	Crossarm, 10', Single	1			
	C	**06 12 01 01**	Insulator, Arm	2			
	D	25 05 069	Insulator, Pin Type	1	3	1	
	E	23 52 066	Bolt, Mach., 5/8" x 14"	3	3	3	2
	F	23 66 027	Washer, Square, 5/8"	6	6	6	
		23 66 131	Washer, Square, 3/16"				6
	G	23 06 085	Bracket, Standoff, 24" F.G.		2		
	H	23 52 065	Bolt – Machine, 5/8" x 12"		2		
	I	23 52 061	Bolt – Machine, 5/8" x 8" Galv.			1	
	J	**12 00 10 01**	Grounding Unit			1	
	K	23 53 007	Bolt – 24" Double Arming	1	1	1	
	L	23 66 031	Washer – Curved, 3/4"			2	
	M	23 52 063	Bolt, Machine, 5/8" x 10"				1
	N	23 66 134	Washer, Double Coil Spring, 5/8"				3