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I. GENERAL

Signs and tags should not cover the pole brand or other signs and tags.

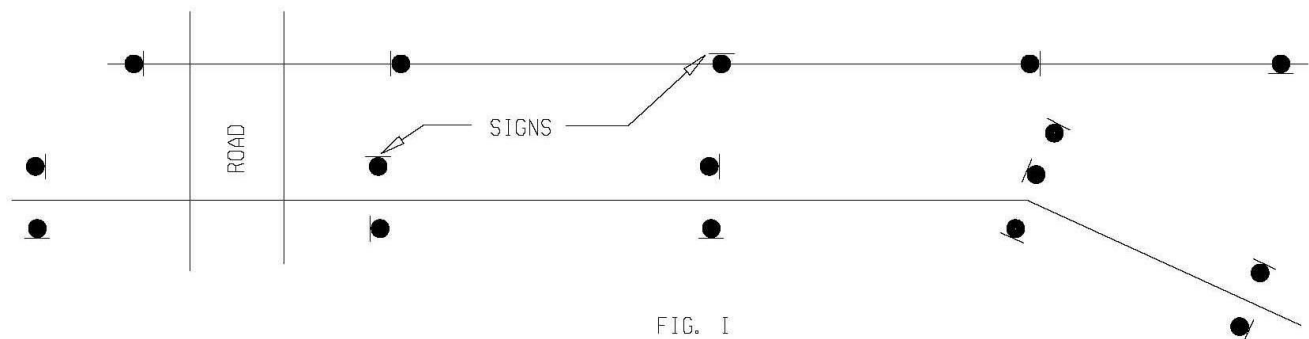
Signs and tags that have deteriorated or are missing shall be replaced on maintenance when doing routine work. Routine work includes prep.

Danger signs that are legible and in reasonable condition do not have to be replaced.

II. WARNING HIGH VOLTAGE SIGNS

“Warning High Voltage” shall be placed as follows:

- A. On all poles or structures supporting conductors of more than 600 volts.
- B. On gates to customer ground settings, fastened to the fence, on all sides of the fence exposed to the public and on doors to building transformer vaults with more than 600 volts.
- C. On structures attached to bridges or buildings for the purpose of supporting conductors of more than 600 volts.
- D. On closely latticed poles or towers supporting conductors of more than 300 volts.
- E. Mounting Instructions
  1. Place the top of approved signs at 6 feet from the ground line and direct them toward the logical traffic, such as the street, playground, waterway, boat ramps, etc. For transmission lines going cross country, see Figure I. Where handbills covering the sign are a problem, it can be put as high as 8 feet above ground.
  2. On wood poles, use sign 135-5460. Nail to the pole with galvanized roofing nails, 135-4420.
  3. On customer settings and fences, use sign 142-4825. Fasten to the gate and fences using aluminum tire wire.
  4. On steel and concrete poles, use sign 135-5460. It shall be attached with Scotch 3M double-coated foam tape (141-8000 or 141-8001). The area of attachment to any steel or concrete shall be wiped clean with isopropyl alcohol. Do not apply it below 40 degrees because the adhesive won't stick. Sign shall be placed at a height of six feet above the ground line to the top of sign.
  5. On steel towers, use sign 135-5460. A sign shall be attached to each side of tower (four sides) at a height of six feet above the ground line to the top of the sign. It shall be attached with Scotch 3M double-coated foam tape. The area of attachment shall be wiped clean with isopropyl alcohol. Do not apply below 40 degrees because the adhesive won't stick.



III. POLE NUMBER TAG

A. *Distribution Poles*

In order to comply with Public Service Commission of Wisconsin requirements, all poles shall have a pole number tag. The pole number tag for each pole shall be made up using an aluminum mounting strip, 13" long for 12 characters (134-5767), 10" long strip holding 9 characters (134-5768) or an 8" long strip holding 7 characters (134-5769). The polyethylene numbers and letters start in the MCS system at 134-5648.

The tag shall be placed on the road or street side of the pole. On back lot line construction, the tag shall be placed on one of the sides of the pole that faces a road.

The bottom of the tag should be 5 to 6 feet above ground level.

B. *Transmission Poles*

For wood, steel, concrete, or laminate poles having facilities that operate greater than 50 kV, contact the American Transmission Company for their tagging procedure.

C. *Ornamental Fiberglass Poles*

Pole tag should be mounted with self-tapping screws or a label printed from a label maker.

IV. FUSE SIZE TAG

All 100 amperes or less sectionalizing locations shall be tagged with a seven-inch pole number tag carrier strip and the appropriate numbers indicating the proper fuse size. A letter "A" following the number shall be used to identify the number as the ampere rating of the fuse. For SMU-style fuses, a letter "E" following the fuse size shall be used to identify the type of fuse (e.g., "200E").

The fuse size tag shall be placed above horizontal pole number tags and immediately to the right of vertical pole number tags.

If two single-phase taps or UG risers are taken from the same pole and the fuses are different sizes, separate vertical tags shall be placed with the general direction of the tap line (N, NE, E, SE, etc.) preceding the fuse size.

When a transformer fuse is placed on a pole 2-3 spans away from the transformer, the pole shall be tagged with a fuse size and a letter "T" after the fuse size.

V. PHASE MARKINGS

Phase markings shall be installed at substation exits. They shall be installed at all sectionalizing locations and three-phase branch lines. Phases are identified by installing a three-inch aluminum letter on the crossarm in such a position that it will be plainly visible from the ground or by installing yellow letters on the side of the pole 5 to 6 feet above ground line so when facing the pole and looking up the conductors will correspond to the phase sequence on the pole.

"A" Silver Letter	135-4350	"ΦA" Vertical Yellow Letter	134-5780	"ΦA" Horizontal Yellow Letter	134-5783
"B" Silver Letter	135-4351	"ΦB" Vertical Yellow Letter	134-5781	"ΦB" Horizontal Yellow Letter	134-5784
"C" Silver Letter	135-4352	"ΦC" Vertical Yellow Letter	134-5782	"ΦC" Horizontal Yellow Letter	134-5785



VI. NON-COMPANY SIGNS

Only traffic- type governmental signs are allowed on poles. These are allowed only if they cannot be installed on separate posts at least six (6) feet from the pole. Attachment shall be made using lag screws. Signs shall be removed prior to doing work on the pole and replaced promptly after work is completed. Removed signs shall be placed in view of affected traffic.

VII. FEEDER IDENTIFICATION

Feeder riser poles outside substations shall be identified as to feeder number. Use numerals and letters (151-59--) attached to the back of a "Warning High Voltage" sign (135-5460), e.g., FDR 241. Place sign directly above or below the "Warning High Voltage" sign.

VIII. PRESERVATIVE TAGS

Tags with the year on them are available with Patox II pole wraps. They shall be nailed to all poles that are ground line treated. They shall be placed below horizontal pole number tags and immediately to the left of vertical pole number tags. See Std P40.

IX. POLE SIZE AND CLASSIFICATION TAGGING

When used poles are brought into stock, they shall be checked for the proper class by measuring the circumference 6 feet from the butt and at the top. Refer to the table on Std P30 for the proper dimension. Then tags, with the proper class and length, shall be affixed to the butt and at approximately 10 feet from the butt where the old class and length of the pole was branded. If the pole was shaved at the ground line, it may now fall into a weaker class. In this case, the old brand shall be shaved off. It is the responsibility of the personnel unloading the pole to properly tag it.

X. NEUTRAL ISOLATION SIGNS

Neutral Isolation Signs (134-6664) shall be placed on all poles which have Neutral Isolators on them. See [Std T135](#).

XI. DEFECTIVE TRANSFORMER BRACKET WARNING SIGN

See Std T145.

XII. POLE REJECT AND DANGER TAGS

## A. General:

These tags are placed on our poles, either under the pole number tag or to the left of it, by our groundline inspection contractors when they have determined that the pole has deteriorated to such an extent that it isn't worth treating. Before working such poles, take all precautions necessary as indicated in [Safety Rule](#) 411 and 413L.

## B. Company Tags

## 1. Reject Pole Tag (Stock Code Number 134-5771)

Reject pole tag will be a red background with a white depiction of an arrow with an X through it. The direction of the arrow should point to the direction of the portion of the pole that is deteriorated.

## 2. Danger Pole Tag (Stock Code Number 134-5772)

Danger pole tag will be a red background with a white depiction of an arrow with a circled X through it. The direction of the arrow should point to the direction of the portion of the pole that is deteriorated.

## 3. Reinforceable Pole Tag (Stock Code Number 134-5773)

Reinforceable pole tag will have the word "REINFORCEABLE" along with a reject pole tag. This indicates that the pole may be able to be reinforced with a stub pole or a C-Truss installation.



## I. General

Designated field personnel (crew leader, coordinator, or inspector) should determine if poles removed from service are reusable, based on the reusable pole requirements below. If there is any question whether or not the pole meets the reusable requirements, it should be disposed of. American Transmission Company personnel will rule on their own poles.

## A. Reusable Pole Requirements (must meet all)

1. Less than 10 years old, based on pole brand.
2. Pole is removed by WPS employees.
3. Free of any defects as determined by field personnel (see list below).

## B. Unusable Poles (scrap poles)

1. Butt-treated cedar distribution poles.
2. Douglas Fir distribution and transmission poles.
3. Poles identified as "Danger" or "Reject" by the Company's Inspection Program.
4. Poles broken in lengths of less than 30 ft.
5. Poles without a brand.
6. Poles in questionable condition.
7. Poles that are branded SPG or SPX.
8. Poles that were previously fumigated.
9. Poles that were reinforced.

## C. Restock a Reusable Pole

1. Remove all hardware (wire, nails, guards, etc.) except the class tag.
2. Notify storeroom/warehouse of the quantity, size, and class of poles being returned. Quantity and stock code are also acceptable.

## D. Consult the Material &amp; Standards group for determining if fiberglass, concrete, steel or laminate poles can be reused.

## II Disposal Guidelines for Unusable Poles

- A. Remove all hardware (wire, nails, guards, etc.) except the class tag.
- B. Scrap poles greater than 15' that come into our warehouse will be recycled with our pole vendor.
- C. Scrap poles less than 15' should be thrown in the landfill dumpster.

## III. Pole Requests

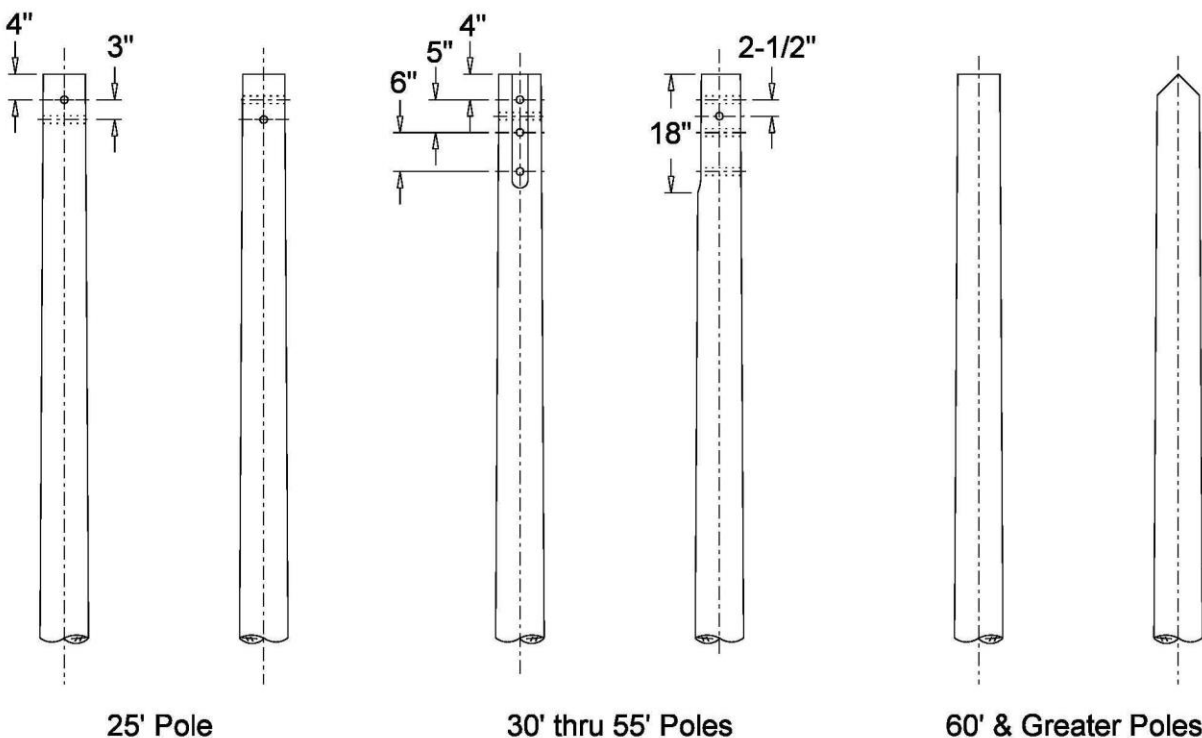
## A. Wisconsin Public Service Employees May Remove Scrap Poles:

1. Prior management approval.
2. Complete a signed liability waiver (159-2126). The original signed liability waiver shall be returned to Investment Recovery.
3. Provide own means of transporting poles.
4. Utilize own equipment for cutting poles.
5. All time spent preparing, loading, and removing scrap poles must be completed outside of the employee's normal working hours.

## B. Landscapers/Contractors

1. Request must be made to Investment Recovery.
2. Provide own means of transporting poles.
3. Utilize own equipment for cutting poles.
4. Allowed on the property from 8 a.m. to noon, Monday through Friday, except holidays, for the purpose of picking up scrap poles.
5. Supply Chain personnel admit landscapers/contractors into the yard and shall visually check for any suspicious behaviors or activities that would pose a safety or security risk or violate Company policies, such as fitness for duty.

6. Landscaper/contractor must complete a signed liability waiver (159-2126). The original signed liability waiver shall be returned to Investment Recovery.
  7. Landscaper/contractor shall be advised that Wisconsin Public Service recommends that a hard hat, safety glasses, leather gloves, closed-toe shoes, long-sleeved shirt, and long pants be worn when handling poles. If the landscaper/contractor elects not to wear PPE, he/she must sign their initials in the space provided at the bottom of the waiver.
  8. Supply Chain personnel shall not assist the landscaper or contractor with cutting or loading.
- C. Customer from Job Site
1. Crew leader/operations supervisor must approve.
  2. Scrap poles must be stripped of all hardware. (tags, signs, wire, nails, guards, etc.)
  3. Scrap poles must be placed so as not to cause a hazard to the customer removing the pole.
  4. Crew leader/operations supervisor must complete a liability waiver (159-2126) and have the customer sign. The original signed liability waiver shall be returned to Investment Recovery.
- D. Used poles can be donated to community groups in approved circumstances. All donations should be approved by Community Relations and local leadership.



25' Pole

30' thru 55' Poles

60' &amp; Greater Poles

6

## □ Notes:

- Holes shown are drilled 1/16" prior to treatment of poles at the locations and in the axial planes shown with as little deviation from the planes as possible. Any additional holes shall be drilled likewise.
- Additional holes for machine bolts and double arming bolts shall be drilled 1/16" larger than the bolt for which it will be used. Holes drilled for lag screws shall be 1/16" smaller and the approximate depth of the lag to be inserted in it.
- Additional equipment mounting holes shall be drilled at least 2-1/2" from any other hole regardless of its plane.
- Hereafter, the hole 7" from the top of a 25-foot pole and 6-1/2" from the top of all other poles will be referred to as the "reinforcing hole." The hole 15" from the top of 30-55-foot poles will be referred to as the "crossarm hole." These holes are not necessarily used only for the purpose their name indicates.
- Gains shall not be cut in any pole after it has been treated. A 135-3790 crossarm gain (for 3-1/2" to 5-1/2" arms) or a 134-4377 crossarm gain (for 7" to 10" arms) shall be installed on the pole when it is necessary to provide a flat surface for attachment of the crossarm.
- For all species of poles 60 feet and taller, the poles shall be "peaked roofed" and no framing holes drilled.



Pole top reinforcing should be used on all wood poles. Pole top reinforcing is sometimes referred to as installing an "anti-split bolt." It is required on poles used in line construction having any degree of angle. The pole top reinforcing bolt shall be installed on all poles that are used with the pole hitch and then can be left in place.

Std P15 (framing specifications for wood poles) provides for drilling of poles by the pole suppliers with an 11/16" hole at right angles and between the holes for the pole top pin or bracket. (On the 25' pole this would be the lower of the two holes.) A 5/8" x 8" or 10" machine bolt square nut, MF lock nut and 2-1/4" x 2-1/4" square washers used in this hole to prevent the pole from splitting.

All poles with existing 1/2" reinforcing bolts can be left as such; this bolt will provide enough strength to prevent the pole from splitting.

When work is done on poles used on angle construction that do not have the reinforcing bolt hole, the pole top shall be drilled with an 11/16" hole and a 5/8" bolt, nuts and washers installed. If there is an existing 9/16" hole, it shall be re-drilled with an 11/16" hole and a 5/8" bolt, nuts and washers installed.

The setting depths for poles shall be per the table and notes below. In rocky soil conditions, an attempt should be made to achieve the firm soil setting depth. If this depth is unable or unreasonable to achieve, the reduced depths shown in the table below may be utilized for poles set in solid rock.

Pole Length (ft)	Embedment Depth in Firm Soil (ft)	* Solid rock reduced embedment depth (ft) where the soil depth above the top of the rock is:			
		0 ft	2 ft	4 ft	6 ft
25	5.0	3.5	4.0	4.5	5.0
30	5.5	3.5	4.5	5.0	5.0
35	6.0	4.0	5.0	5.5	5.5
40	6.0	4.0	5.0	6.0	6.0
45	6.5	4.5	5.0	6.5	6.5
50	7.0	4.5	5.5	7.0	7.0
55	7.5	5.0	6.0	7.5	7.0
60	8.0	5.0	6.0	8.0	8.0
65	8.5	5.5	6.5	8.5	8.5
70	9.0	6.0	6.5	8.5	9.0
75	9.5	6.0	7.0	8.5	9.5
80	10.0	6.5	7.0	9.0	10.0
85	10.5	7.0	7.5	9.0	10.5
90	11.0	7.0	7.5	9.0	11.0
95	11.5	7.0	8.0	9.0	11.0
100	12.0	7.5	8.5	9.5	11.5

Notes for Solid Rock - Reduced Burial Depths:

1. For in-between soil depths above rock, use the next higher value. For over 6 feet of soil, full firm soil burial depth is needed.
2. Reduced burial depths are for solid rock only (not loose rock or boulders).
3. For NESC grade B construction applications (such as highway or railroad crossings), full firm soil burial depth is needed. Consult the Field Application Engineer if these depths are not achievable.

General Notes:

1. For "H" class poles, add 1 foot of burial depth to the table values, as well as backfill the hole with crushed stone or gravel.
2. For poor soil (such as loose sand, quicksand, marsh), increase the setting depth listed in the table by at least 1 foot. The use of a culvert should apply when setting a pole in poor soil conditions, and the hole shall be backfilled with crushed stone or gravel.
3. Poles set in sloping banks or within three feet of the edge of a steep bank should be set a minimum of 1 foot deeper than indicated in the table above. The depth shall be measured from the lower side of the hole.
4. When it is known that the ground grade will be lowered, poles should be set deeper to allow for the required burial depth at final grade. If adequate wire clearance cannot be maintained initially due to the temporary increased burial depth, the pole shall initially be set at the required depth and a return trip made to reset the pole after final grade is established.

5. When it is known that grade will be raised 1 foot or less within six months of setting the pole, it may be set so that the pole has the required depth once final grade is established. If the grade is to be raised more than 1 foot, poles should be set at the required depth immediately. If adequate wire clearance cannot be maintained after the grading has been completed, a return trip must be made to jack poles up to the required depth.
6. Poles set at angles and deadends should be raked away from the strain (6" to 48" depending on the length of the pole and the load carried) so that the pole is in line after the wires are strung.
7. When right-of-way allows, the bottom of the pole may be shifted out of the pole line in order to increase the lead of steep guys.
8. All pole holes should have the backfill tamped with a hydraulic tamper, if practical. The hole shall be filled with 3 feet of backfill and then tamped, filled with 2 feet of backfill and then tamped, filled up and tamped again.
9. If conditions allow, dirt should be mounded around the pole approximately 10 inches to alleviate future settling.
10. For poles taller than 100 feet, contact the Material & Standards group for burial depth requirements.

### TRANSMISSION

Contact the American Transmission Company for burial depth requirements for poles that have energized facilities in excess of 50 kV.

**WISCONSIN PUBLIC SERVICE ELECTRIC DISTRIBUTION STANDARDS**

01/01/13

**P30**

**POLE DATA**

Page 1 of 2

**SOUTHERN YELLOW PINE AND DOUGLAS FIR  
(Fiber Strength: 8,000 psi)**

<b>Class</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Minimum Pole Top Circumference (In.)</b>	27	25	23	21	19	17	15
<b>Length of Pole (Ft.)</b>	<b>Minimum Circumference Six Feet from Butt (Inches) and Maximum Weight for 10# Treatment (Pounds)</b>						
25	33.5 1025.0	31.5 939.0	29.5 697.0	27.5 600.0	25.5 517.0	23.0 436.0	21.5 362.0
30	36.5 1325.0	34.0 1119.0	32.0 954.0	29.5 807.0	27.5 694.0	25.0 590.0	23.5 496.0
35	39.0 1620.0	36.5 1390.0	34.0 1196.0	31.5 1045.0	29.0 900.0	27.0 767.0	25.0 669.0
40	41.0 1949.0	38.5 1679.0	36.0 1511.0	33.5 1304.0	31.0 1097.0	28.5 953.0	
45	43.0 2300.0	40.5 2060.0	37.5 1801.0	35.0 1551.0	32.5 1319.0	30.0 1153.0	
50	45.0 2747.0	42.0 2420.0	39.0 2090.0	36.5 1801.0	34.0 1547.0		
55	46.5 3379.0	43.5 2898.0	40.5 2483.0	38.0 2183.0			
60	48.0 3898.0	45.0 3311.0	42.0 2836.0	39.0 2475.0			
65	49.5 4540.0	46.5 3770.0	43.5 3178.0	40.5 2773.0			

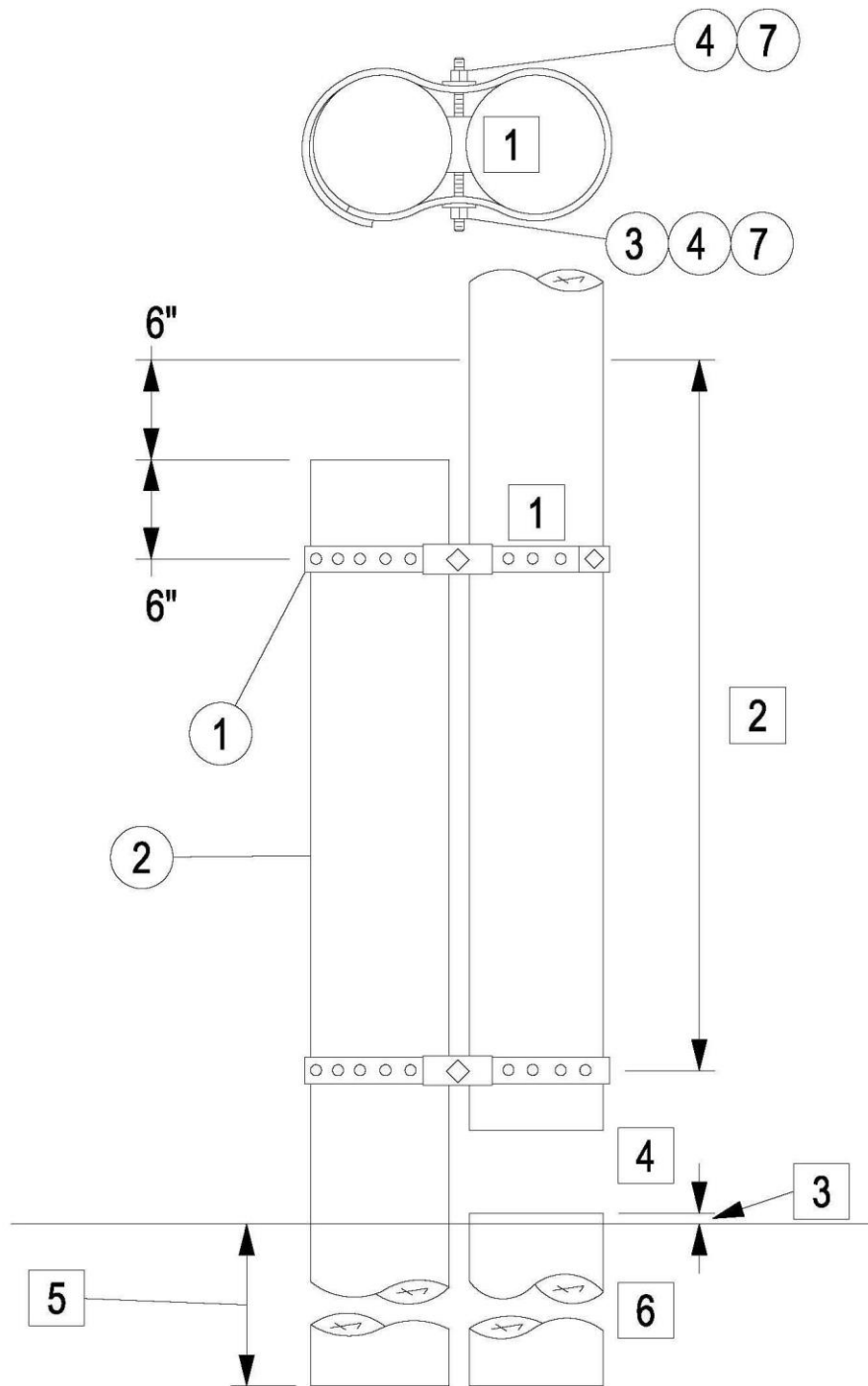
**RED PINE  
(Fiber Strength: 6,600 psi)**

<b>Class</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>Minimum Pole Top Circumference (In.)</b>	27	25	23	21	19	17	15
<b>Length of Pole (Ft.)</b>	<b>Minimum Circumference Six Feet from Butt (Inches) and Maximum Weight for 10# Treatment (Pounds)</b>						
30	39.0 1264.0	36.5 1099.0	34.0 956.0	31.5 806.0	29.0 684.0	27.0 584.0	25.0 494.0
35	41.5 1553.0	38.5 1350.0	36.0 1174.0	33.5 1002.0	31.0 866.0	28.5 748.0	26.5 641.0
40	44.0 1870.0	41.0 1626.0	38.0 1414.0	35.5 1217.0	33.0 1053.0	30.5 909.0	
45	46.0 2197.0	43.0 1910.0	40.0 1661.0	37.0 1432.0	34.5 1242.0	32.0 1085.0	
50	48.0 2562.0	45.0 2228.0	42.0 1937.0	39.0 1650.0	36.0 1443.0		
55	49.5 2945.0	46.5 2561.0	43.5 2227.0	40.5 1915.0			

WESTERN RED CEDAR (Fiber Strength: 6,000 psi)							
Class	1	2	3	4	5	6	7
Minimum Pole Top Circumference (In.)	27	25	23	21	19	17	15
Length of Pole (Ft.)	Minimum Circumference Six Feet from Butt (Inches) and Maximum Weight for 10# Treatment (Pounds)						
25	37.0 879.0	34.5 745.0	32.5 621.0	30.0 496.0	28.0 414.0	25.5 331.0	24.0 259.0
30	40.0 1035.0	37.5 879.0	35.0 755.0	32.5 631.0	30.0 517.0	28.0 434.0	26.0 362.0
35	42.5 1242.0	40.0 1035.0	37.5 879.0	34.5 776.0	32.0 673.0	30.0 579.0	27.5 486.0
40	45.0 1552.0	42.5 1347.0	39.5 1139.0	36.5 931.0	34.0 828.0	31.5 724.0	
45	47.5 1862.0	44.5 1607.0	41.5 1347.0	38.5 1192.0	36.0 1139.0		
50	49.5 2070.0	46.5 1862.0	43.5 1607.0	40.0 1450.0	37.5 1347.0		
55	51.5 2380.0	48.5 2070.0	45.0 1812.0	42.0 1209.0			
60	53.5 2690.0	50.0 2278.0	46.5 2070.0	43.5 1967.0			
65	55.0 3313.0	51.5 2590.0	48.0 2380.0	45.0 2278.0			
70	56.5 3713.0	53.0 3105.0	49.5 2795.0	46.0 2692.0			
75	58.0 4340.0	54.5 3713.0	51.0 3210.0				
80	59.5 5170.0	56.0 4340.0	52.0 3713.0				
85	61.0 5690.0	57.0 4660.0	53.5 4140.0				
90	62.5 6840.0	58.5 5790.0	54.5 4960.0				

NOTES:

1. The pole circumferences above are the ANSI O5.1 minimum standards. Often, pole vendors will supply poles that exceed the ANSI minimum circumference standards and the use of longer bolts will be necessary.
2. ANSI does not provide information for maximum pole weights. The data above for maximum pole weight was provided by the manufacturer. There is a potential of poles exceeding the weight listed above. If there is any doubt, have the pole weighed.



□ Notes:

1. The pole band kit, 134-0566, includes the reinforcing pole band, saddle to rest between poles, and a staple to hold excess band down.
2. Shave off all shell rot. Dimensions shall be no less than four feet.
3. Pole to be cut off as close to ground line as possible.
4. All unsound wood shall be removed.

5. Set depth of stub as follows:
  - a. If there is no increase in height, set depth as required on Std P25 for length of pole being stubbed.
  - b. If there is an increase in height, set depth as required on Std P25 for a pole equal to resultant final length of pole and stub.
6. In swampy areas the old pole butt can frequently be pulled and the stub dropped into the same hole.
7. Stubbing of distribution poles should be performed under the following conditions:
  - a. If a good pole in a rural area might otherwise need to be replaced to provide clearance for telephone joint use, jack it up as needed, and stub it. In rock country this may save blasting near our line.
  - b. Where highway work has altered our ground clearance, it may be increased by stubbing the same as under (a) above.
  - c. Poles in rural areas which are 1) in good condition above the ground, or 2) worth shaving off shell rot, should be stubbed if labor and transportation cost will not be more than 25% of the total cost of replacing the pole (including cost of transferring to the new pole).
8. After setting stub pole lag the poles and stub with 4 3/8" x 3" lags per saddle. Place one washer and thread nut on one end of double arming bolt, nut threaded 1/2" onto bolt. This is the nut that will be used to tighten the band around the pole with a ratchet drill. Line up the center oval ring over the saddle hole so that when bolt leaves the saddle it will project through the center oval. Form the bands around the poles and pull them as tight as possible while still able to match two circular holes over the saddle hole. Insert the bolt into the circular holes, through the saddle, and out the oval hole (band is tightened from over lapping side). Push bolt threads all the way through; this way all bolt excess will be on the oval hole side. Hand tighten a washer, thread nut and locknut to the bolt on the excess side. Use the ratchet drill to tighten down the 1/2" threaded nut on bolt. This will tighten the bands. When band is tight, place a locknut on ratcheted side. Use 1/2" x 4" lag screw to secure the excess band to the pole. The staple can be placed across the width of the band at the end of the excess to aid in securing the excess flap. Cut off excess bolt so that it comes flush with poles.

ITEM	MATERIAL		NO.REQ.	ITEM	MATERIAL		NO.REQ.
1	REINFORCING POLE BAND KIT	134-0566	2	5	3/8" LAG SCREW	135-5290	8
2	12', 14', OR 16' STUB	132-0041, 132-0044 OR 132-0047	1	6	1/2" X 4" LAG SCREW	135-5300	2
3	5/8" X DOUBLE ARMING BOLT	135-00__	2	7	5/8" ROUND WASHER	135-9200	4
4	5/8" LOCKNUT	135-4480	4				

## I. DISCUSSION:

The area of the pole near the groundline is the critical area (2" above ground to 18" below). This area is most susceptible to decay, and it is therefore important that the wood be thoroughly saturated with preservative at all times. When a pole is set new, there is some surplus of preservative in the outside wood which soaks into the soil and tends to sterilize the soil and retard decay. In time, leaching action removes the surplus preservative from the surface wood; if we reuse the pole without restoring the surface wood preservative, we are inviting decay to start in the critical groundline area.

## II. DEFINITION OF A USED POLE:

The term "Used Pole" refers to a pole which has been removed from service and either returned to the pole yard for future use or reused immediately at another location. This will include poles which are simply moved by trenching or lifting and resetting.

Treat all used poles with procedure and materials listed before reusing them. Also apply when new/used pole is to be set in pavement or other future unexcavatable area.

## III. PROCEDURE:

A. Read and follow Patox II label instructions. Keep unused product and container together.

In Addition to Label Instructions:

- B. Neoprene gloves and long-sleeved shirts must be worn when the Patox II is applied.
- C. Cut required size from Patox II roll, allowing a 2" overlap.
- D. Tightly position the Patox II pole wrap around the pole so that approximately 2" is above the groundline. (In pasture areas, position top of wrap at groundline.)
- E. Staple or nail the top edge and vertical seam of the Patox II wrap to the pole.
- F. Tag the treated pole with the aluminum tag provided which indicates the type and year of treatment. Attach the tag to the pole immediately below the pole tag.
- G. If clothing becomes soiled from Patox II, launder these clothes separately from other household laundry.

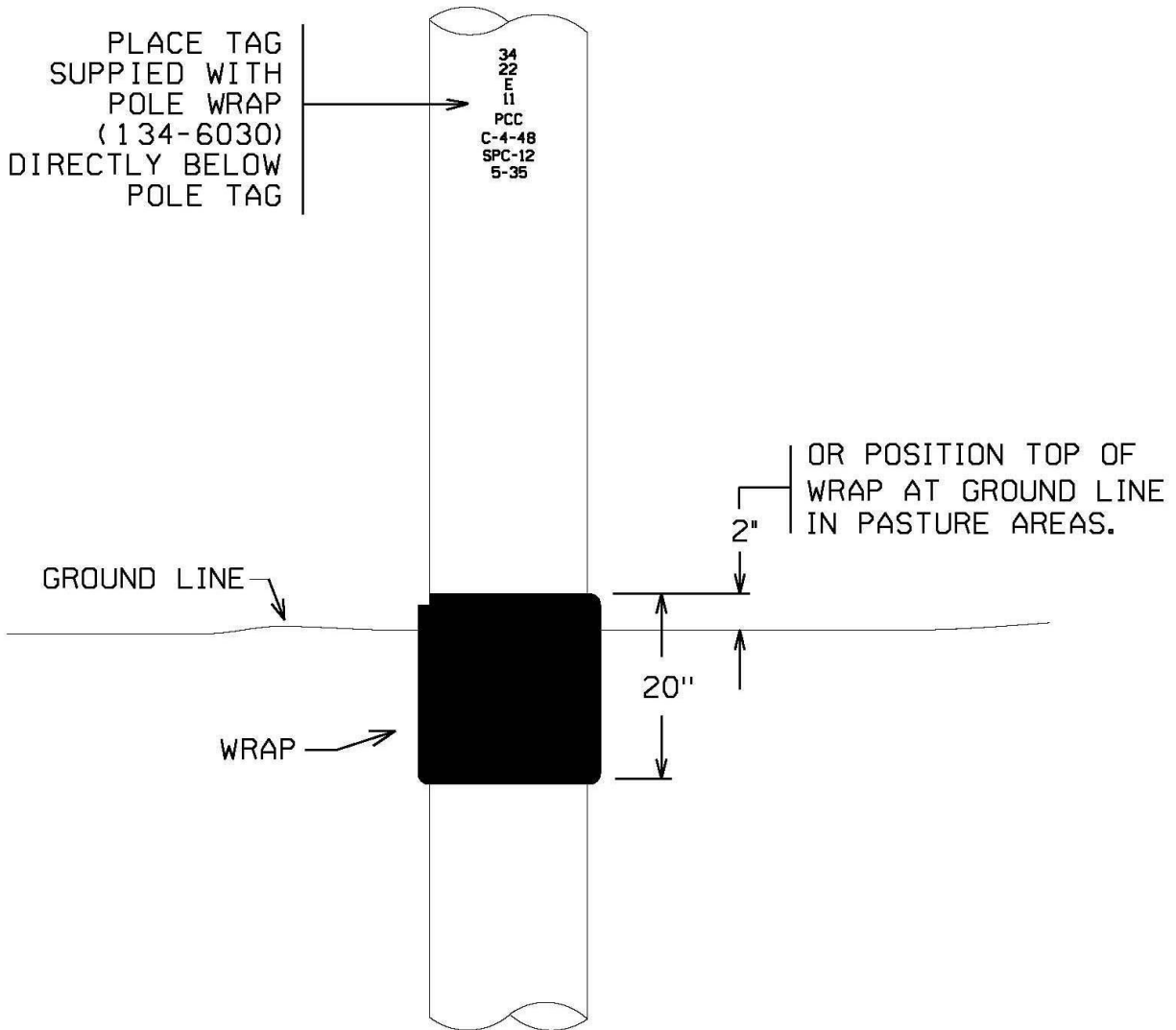
A different technique from that outlined above, such as applying the bandage before lowering the pole all the way into the hole, is acceptable. However, it is important that the bandage be at the proper depth and not be damaged when the pole is lowered.

## IV. MATERIALS:

134-6030 20" x 25' Osmose Patox II Pole Wrap  
134-4501 Neoprene gloves

Stapler and staples / nails

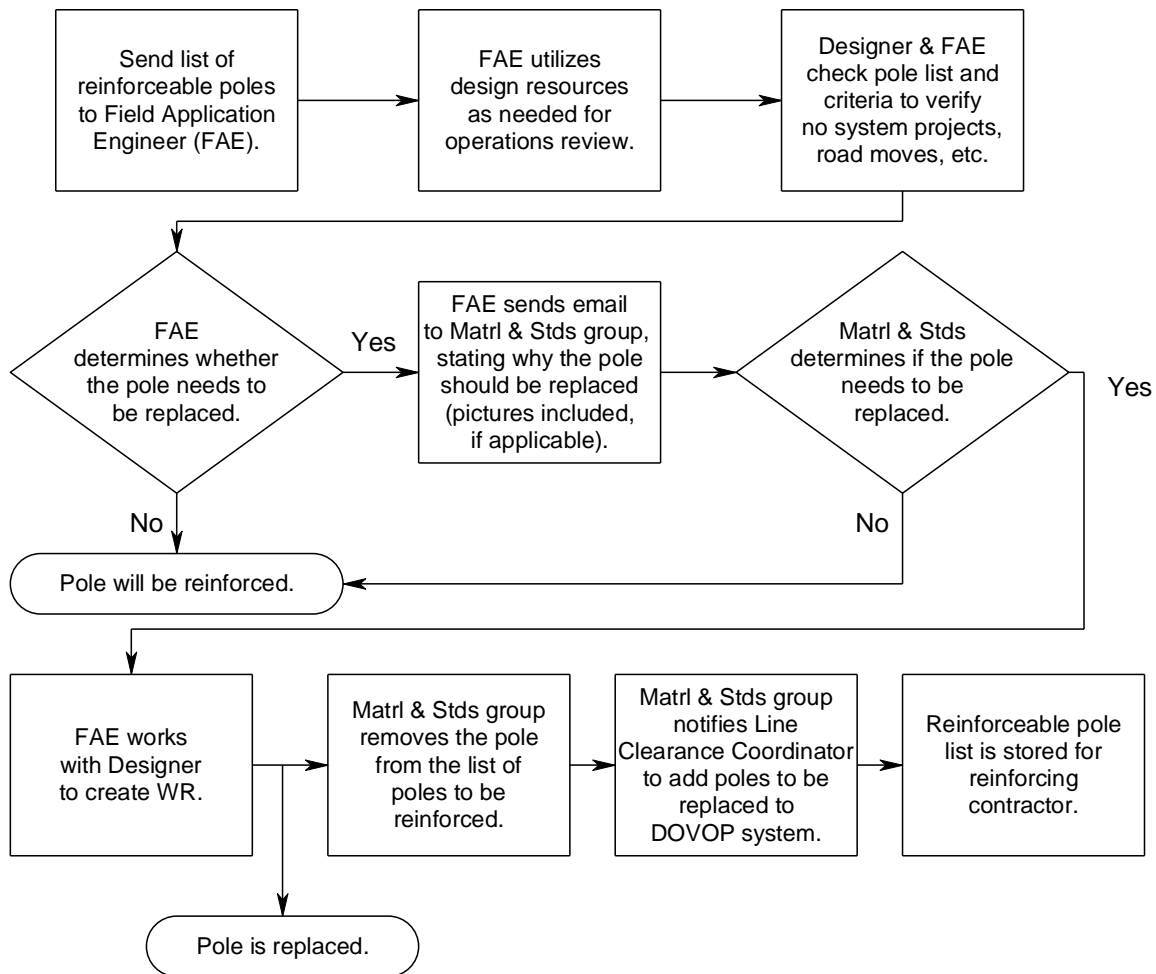




PRESERVATIVE WRAP FOR REUSED WOOD POLE

□ Notes:

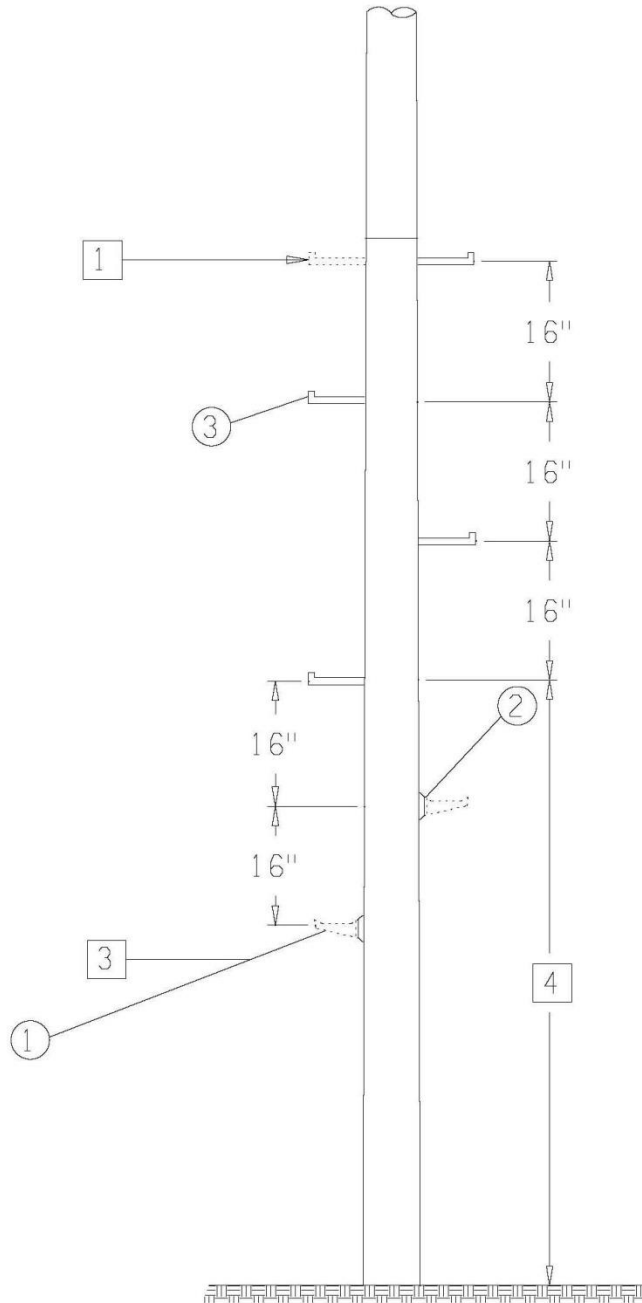
1. Install wrap on all poles set in concrete or areas that prohibit ground line treatment.



#### GUIDELINES FOR A POLE NOT TO BE REINFORCED, REFERENCED BY THE INSPECTION CONTRACTOR

The following poles will not be reinforced:

1. Pole Inspector determines that the pole's usable life is less than 20 years.
2. Poles standing in water (or areas that have water most of the year).
3. Poles less than class 5.
4. Leaning poles (>20 degrees).
5. Riser poles:
  - More than one electric riser size U-guard
6. Poles with large woodpecker holes.
7. Poles with extreme lightning damage.
8. Poles with pole-top extensions.
9. Poles that fail DOVOP clearance requirements.
10. Poles owned by Frontier Communications (previously Verizon).
11. Poles classified as "danger" poles.
12. Poles more than 200 feet away from a road or driveway.



□ Notes:

1. An additional step shall be placed opposite a step located where work is frequently performed.
2. Where pole is set close to a building with an accessible roof, use detachable steps from the roof level up to a level 8 feet above the roof.
3. Use detachable pole steps where steps are required below the 8 foot level.
4. Locate lowest hook pole step 8 feet above the ground on distribution poles and 8 feet above the ground on joint poles.
5. Pole steps shall be placed on frequently climbed poles only when specified by local supervision.

ITEM	MATERIAL	NO.REQ.	ITEM	MATERIAL	NO.REQ.		
1	DETACHABLE POLE STEP	135-8050	5 OR 4	3	HOOK POLE STEP	135-8020	AS REQ
2	LAG AND PLATE	135-4335	5 OR 4				

This Standard page offers information for calculating basic transverse load on overhead tangent poles with no additional equipment, guying or angles. Additionally, it does not include information on vertical or longitudinal pole loading. The calculations are for wood poles only and only the pole (doesn't include calculations for crossarms, braces, guy wire, support hardware, etc.). Consult the Field Application Engineer to use pole load modeling software to perform loading analyses on poles as necessary.

#### TRANSVERSE LOADING OF LINES

The tables on [Std OHC15](#) and the curves on Std P60 will be necessary in determining:

1. Transverse wind loading on wood poles.
2. Span lengths which can be used with different classes of poles.
3. Class of pole which must be used to obtain desired strength.

For item number 1 above, use the table in Std OHC15 to select the conductor to be used and appropriate span length in feet to determine the transverse load for one conductor. If communication facilities are attached to a pole, contact the communication companies to determine the Horizontal Transverse Wire Load for their facilities.

*Ground Line Moment (kilo ft – lbs) = Transverse Wind Load on a Pole =*

$$= \frac{(\text{Horizontal Transverse Wire Load}) \times (\text{Number of Conductors}) \times (\text{Height Above Ground}) \times (\text{Transverse Load Factor})}{(\text{Strength Factor}) \times 1000}$$

Using the curves on Std P60, follow horizontally to the right of the curve for the length of pole; read on the horizontal scale at the bottom, the class pole required.

TABLE 1 – TRANSVERSE LOAD FACTORS FOR STRUCTURES (NESC Table 253-1)

Construction Grade	Load Factor
NESC Grade B	2.50
NESC Grade C (at crossings of other conductors not on the pole line)	2.20
NESC Grade C (elsewhere)	1.75

TABLE 2 – STRENGTH FACTORS FOR STRUCTURES (NESC Table 261-1)

Construction Grade	Strength Factor
NESC Grade B	0.65
NESC Grade C	0.85

Note: The strength factors in Table 2 are usually used to reduce the strength of the structure. For the sake of simplicity, the strength reduction factor is used to increase the loading on the structure.

Example 1:

- New single-phase construction:
  - 1/0 ACSR phase conductor (34 feet above ground)
  - 1/0 ACSR neutral (29 feet above ground)
- 40' pole, 300 foot span, NESC Grade C construction (no crossings)
- From [Std OHC15](#), the horizontal transverse wire load on 1/0 ACSR is 139.8 lbs.

$$\text{Phase Conductor Loading} = \frac{(139.8 \text{ lbs}) \times (1 \text{ conductor}) \times (34.0 \text{ feet}) \times (1.75)}{(0.85) \times 1000} = 9.79 \text{ kft} - \text{lbs}$$

$$\text{Neutral Conductor Loading} = \frac{(139.8 \text{ lbs}) \times (1 \text{ conductor}) \times (29.0 \text{ feet}) \times (1.75)}{(0.85) \times 1000} = 8.35 \text{ kft} - \text{lbs}$$

$$\text{Ground Line Moment} = 9.79 \text{ kft} - \text{lbs} + 8.35 \text{ kft} - \text{lbs} = 18.14 \text{ kft} - \text{lbs}$$

- On the curve in Std P60, we find indicated by the dotted line for 40' tall poles that a class 7 pole will serve. Use a 40-foot class 5 pole. The smallest class size 40-foot pole stocked is class 5.

Example 2:

- New three-phase crossarm construction:
  - 336.4 ACSR phase conductor (39 feet above ground for middle phase, 38 feet above ground for outside phases)
  - 1/0 ACSR neutral (34 feet above ground)
- 45' pole, 250 foot span, NESC Grade B construction
- From Std OHC15, the horizontal transverse wire load on
  - 336.4 ACSR is 138.8 lbs.
  - 1/0 ACSR is 116.5 lbs.

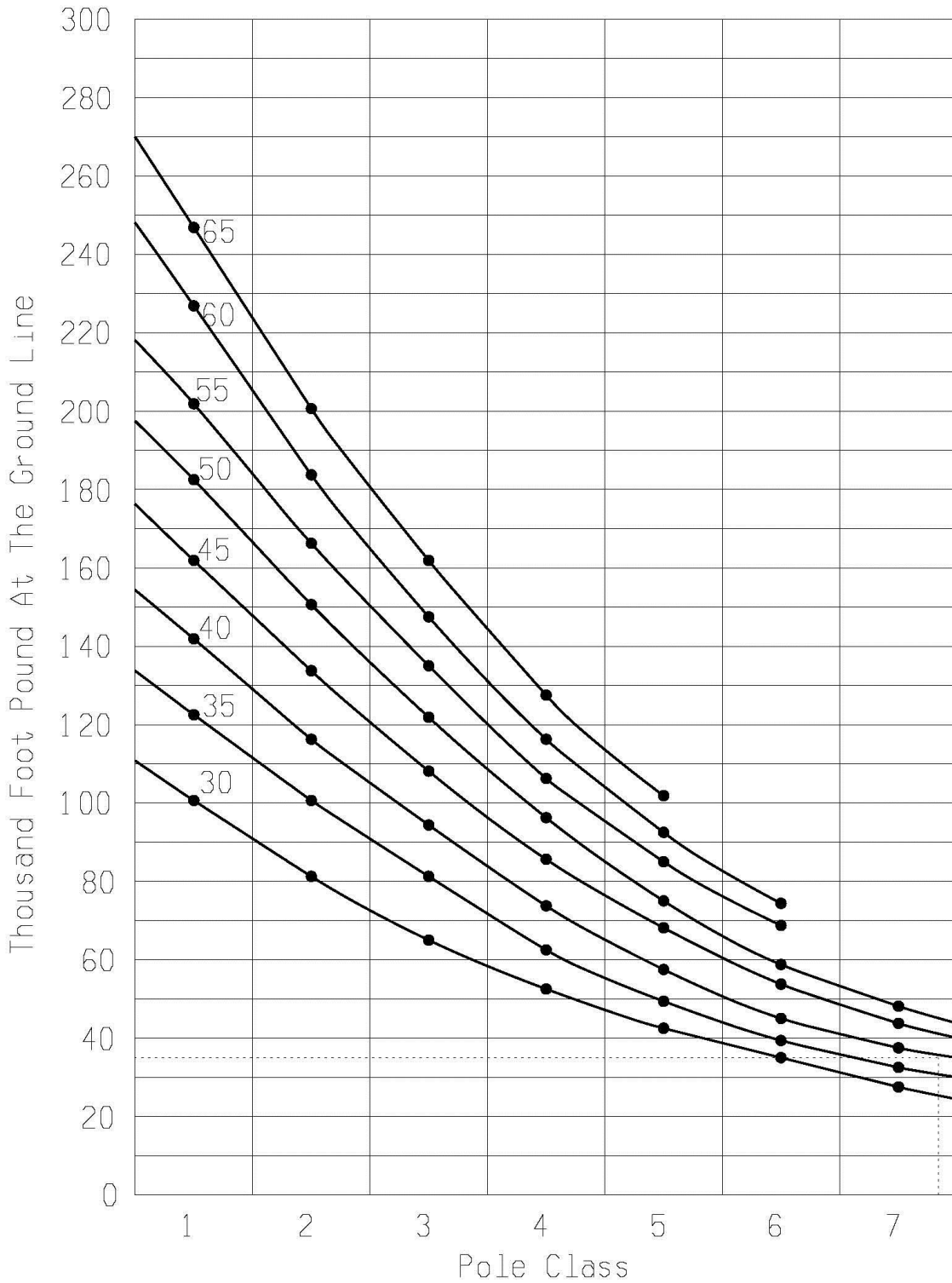
$$\text{Middle Phase Conductor Loading} = \frac{(138.8 \text{ lbs}) \times (1 \text{ conductor}) \times (39.0 \text{ feet}) \times (2.50)}{(0.65) \times 1000} = 20.82 \text{ kft} - \text{lbs}$$

$$\text{Outside Phase Conductors Loading} = \frac{(138.8 \text{ lbs}) \times (2 \text{ conductors}) \times (38.0 \text{ feet}) \times (2.50)}{(0.65) \times 1000} = 40.57 \text{ kft} - \text{lbs}$$

$$\text{Neutral Conductor Loading} = \frac{(116.5 \text{ lbs}) \times (1 \text{ conductor}) \times (34.0 \text{ feet}) \times (2.50)}{(0.65) \times 1000} = 15.23 \text{ kft} - \text{lbs}$$

$$\text{Ground Line Moment} = 20.82 \text{ kft} - \text{lbs} + 40.57 \text{ kft} - \text{lbs} + 15.23 \text{ kft} - \text{lbs} = 76.62 \text{ kft} - \text{lbs}$$

- On the curve in Std P60, we find indicated by the dotted line for 45' poles that a class 4 pole will serve. Use a 45-foot class 3 pole since class 4 poles are not stocked.



□ Notes:

1. Points are plotted on values of minimum pole strength.
2. Average value will fall between the dot and the heavy line to the left of the dot.

All wood poles are inspected at the pole manufacturer/supplier before shipment to the Company by A. W. Williams Inspection Company (AWW). The poles are inspected in accordance with the American Wood Preservers Association (AWPA) standards and ANSI standards. The inspector will inspect all species of wood poles that the Company purchases, including:

- Southern Yellow Pine
- Red Pine
- Douglas Fir
- Western Red Cedar

Poles that pass the inspection have a:

1. Square stamp on the top of the pole to signify material quality acceptance.
2. Square stamp on the butt end of the pole to signify final acceptance after treatment.

There is also a number with the AWW, but it is not always the same (see Figure 1). Occasionally, a supplier will ship poles which have been rejected and do not bear the inspection stamps. The Company will not pay for rejected poles. A. W. Williams usually advises the company of such shipments. In checking poles upon receipt, unstamped poles should be reported separately.

If it appears at any time that our inspection services are passing poles which should be rejected, notify the Field Application Engineer and the Material & Standards group.

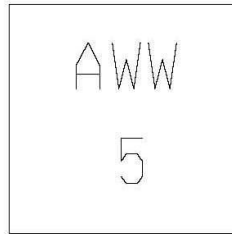


Figure 1 – Typical A.W. Williams Inspection Company Pole Stamp

## WOODPECKER HOLE – IFOAM FILLER

## INSTALLATION INSTRUCTIONS

Note: Working times for IFOAM product:

Winter grade at 40 degrees F	3 hours
Winter grade at 70 degrees F	3 to 5 minutes

IFOAM must be kept warm in winter and cool in summer (before mixing).

**WARNING:** If the IFOAM has hardened while in storage, the containers can be heated in the microwave or placed in hot water to regain its pliability. **DO NOT** put the catalyst in the microwave as it contains metal particles. If overheated, the product may explode through the container, and if too cool, it may not expand in use.

**NOTE:**

Large woodpecker holes should be filled with 2" x 2" blocks of wood as much as possible before the application of the IFOAM. The blocks are to take up some of the space so a smaller amount of the IFOAM can be used. It is quite expensive.

IFOAM comes in the following sizes:

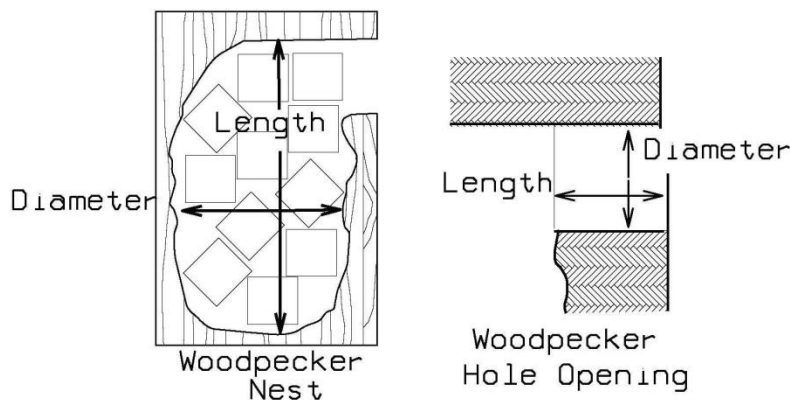
143-5103	3 lb kit
143-5105	5 lb kit
143-5108	8 lb kit

To obtain mixing rods, contact the Material & Standards group.

The 3-pound kit comes in a clip-pak; the other kits are in plastic containers with separate bottles of catalyst.

To determine the amount of IFOAM needed for an application, measure the nest hold and the entrance hole areas as shown, add the areas together, subtract the space taken up by the 2" x 2" wood blocks, and use the scale shown on page 4.

Squeeze the IFOAM into the woodpecker holes and install the cloth patch (supplied with each kit) with staples around the hole. Cut away the excess patch material, and the IFOAM will fill the hole and expand out through the cloth patch to form a wood-like texture that is strong as the surrounding wood and can be climbed over with conventional climbing hooks/gaffs.

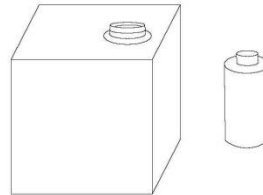


Using a flexible measuring tape, measure the LENGTH and DIAMETER of BOTH the Woodpecker Hole Opening and the Woodpecker Nest. Using the IFOAM Volume chart on page 4, calculate the total amount of IFOAM required to repair the hole.





IFOAM  
IPAK

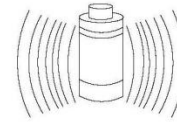
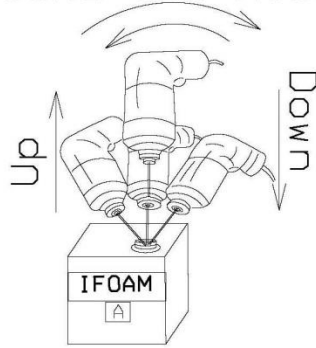


IFOAM  
Gallon  
ITAINER

IPOLE-WPK Kits are available in 3 lb. (IPAKs) and 5 lb. and 8 lb. (gallon-size ITAINERS with catalyst bottles) sizes.

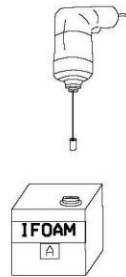
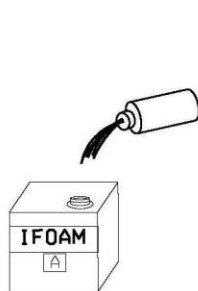
Using the IFOAM Volume chart on page 4, select the IPOLE-WPK Kit size(s) necessary to fill both the Woodpecker Hole Opening and the Woodpecker Nest.

Round and Round

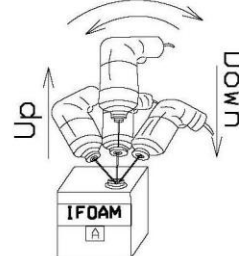


PREMIX ALL containers of IFOAM, Resin (Part A) and Catalyst (Part B), before final mixing and installation.  
For IPAKs: PREMIX colored catalyst by kneading brightly colored material inside IPAK until the color becomes UNIFORM.

For ITAINERS: PREMIX contents of the ITAINER for 2-3 minutes, using an IFOAM Mixing Rod prior to adding catalyst. Thoroughly shake the small plastic catalyst bottle until the color inside becomes UNIFORM.

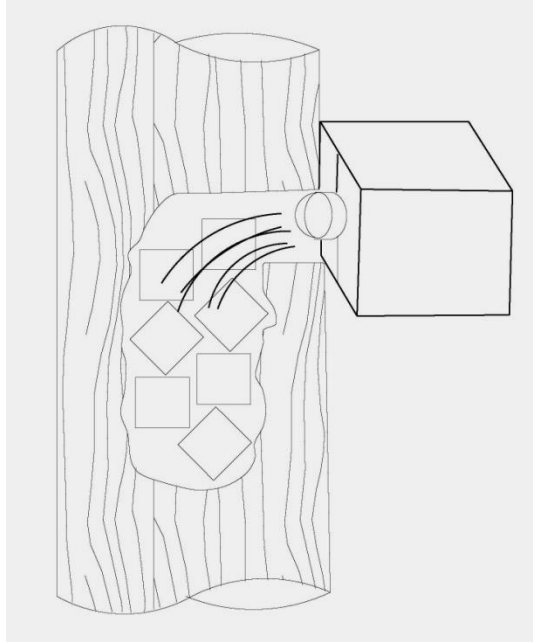


Round and Round



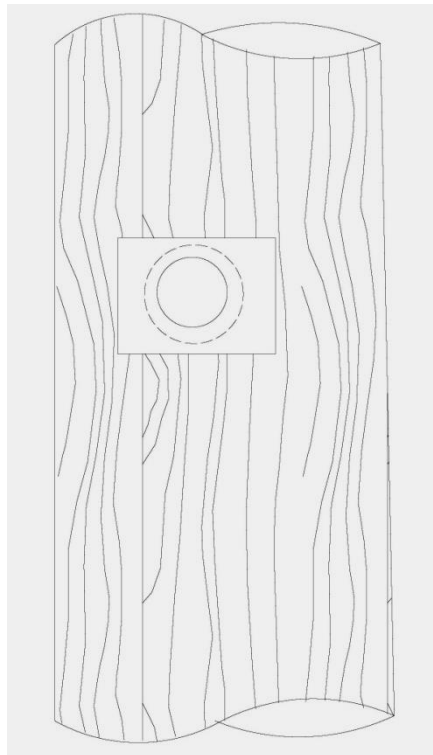
For IPAKs: GENTLY PEEL the Clip and Pin from the IPAK. Using an in-and-out motion, knead the contents of the IPAK until a UNIFORM color is achieved.

For ITAINERS: POUR contents of small plastic bottle into ITAINER. Using an IFOAM Mixing Rod, thoroughly MIX the IFOAM inside the ITAINER until a UNIFORM color is achieved.

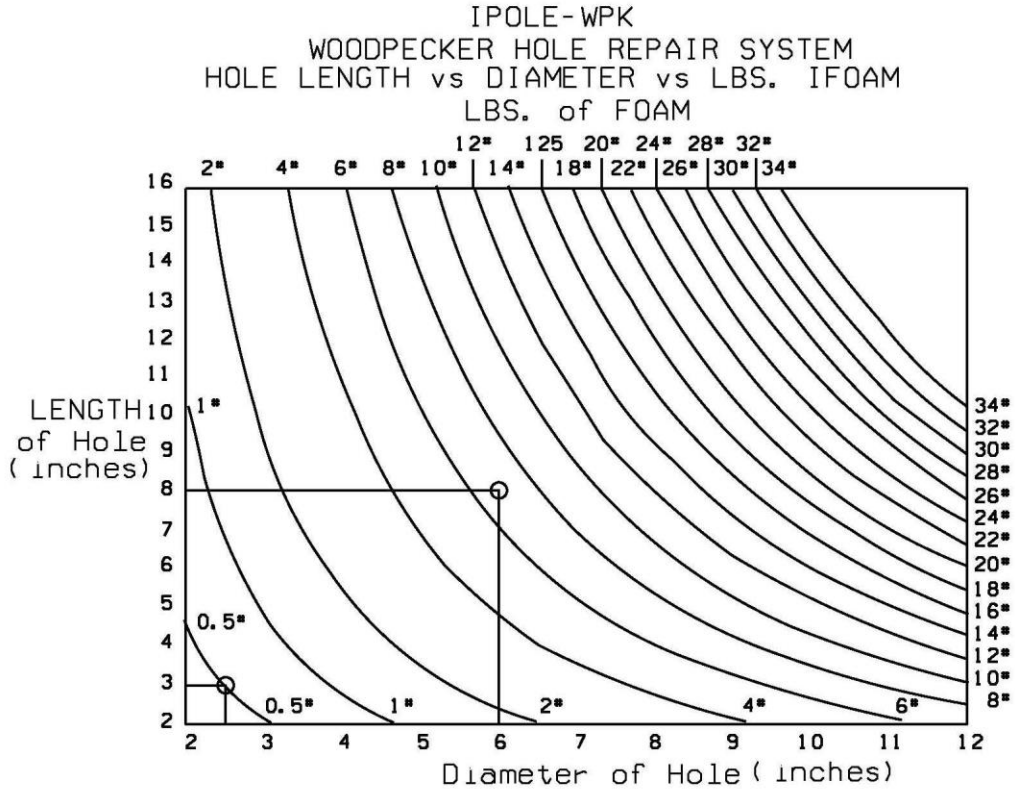


For IPAKs: CUT a SMALL HOLE in a corner of the IPAK and SQUEEZE the IFOAM into the woodpecker hole.

For ITAINERS: SQUEEZE the IFOAM from the flexible plastic ITAINER into the woodpecker hole.

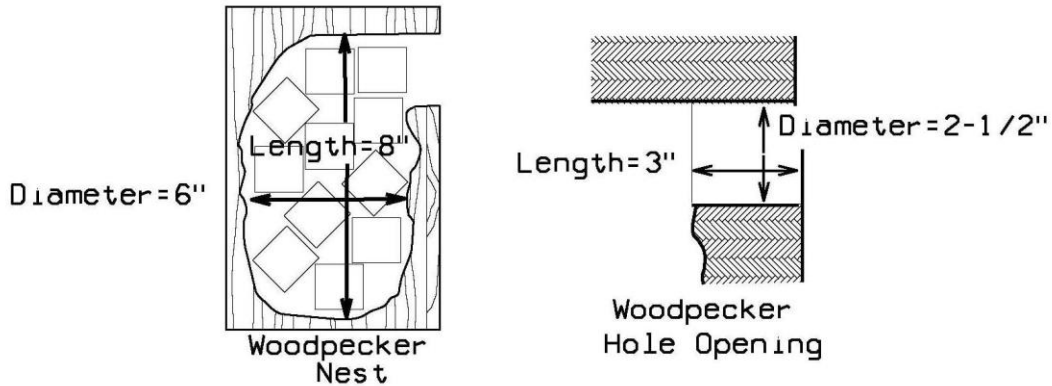


Using a hand-held staple gun, STAPLE the supplied cloth patch over the woodpecker hole opening. Within minutes, the IFOAM will expand and harden, forcing the IFOAM into the wood and through the cloth. TRIM the excess cloth from the repaired woodpecker hole to improve IPOLE-WPK aesthetics.



Example:

Woodpecker Nest is 6" diameter x 8" long.  
Woodpecker Hole Opening is 2-1/2" diameter x 3" long.



Woodpecker Nest:

Go along the bottom of the chart to 6" diameter and up to 8" length. Amount of IFOAM required to fill this Woodpecker Nest is 7 lbs. Subtract space of wood blocks.

Woodpecker Hole Opening:

Go along bottom of the chart to 2-1/2" diameter and up to 3" length. Amount of IFOAM required to fill this Woodpecker Hole and Opening is 1/2 lb.

The TOTAL amount of IFOAM required to fill this example Woodpecker Nest and Hole Opening is:  
7 lbs + 1/2 lb. = 7 1/2 lbs of IFOAM.