

**LAMINATED WOOD
SYSTEMS
POLEENFORCER®
STANDARD
SPECIFICATIONS**



GENERAL STANDARD FOR REINFORCEMENT OF WOOD POLES USING LWS PoleEnforcer® UNITS

1. Scope

This method covers the restoration of in-service wood poles using LWS PoleEnforcer® units. This method shall apply to poles meeting the criteria of these specifications.

2. General

The crew foreman shall comply with all reasonable requests of landowners and tenants relative to access to the right-of-way or easement.

The crew shall always conduct the work with due regard to adequate safety and sanitary requirements and shall maintain their tools and equipment in a safe condition.

3. Definitions

Reject: A pole that does not have the necessary strength to carry the existing load and does not meet the requirement to be reinforced. The PRS Pole Reclassification System® may solve these issues (to be installed by qualified line personnel).

Reject Priority: A pole that does not have the necessary strength to carry the existing load, does not meet the requirements to be reinforced, and needs to have action taken immediately. The PRS Pole Reclassification System® may solve these issues (to be installed by qualified line personnel).

Reported Pole: A pole that does not meet requirements to be reinforced for reasons other than remaining strength. Examples may include, but not limited to, structure height, condition of pole above grade or condition of pole attachments.

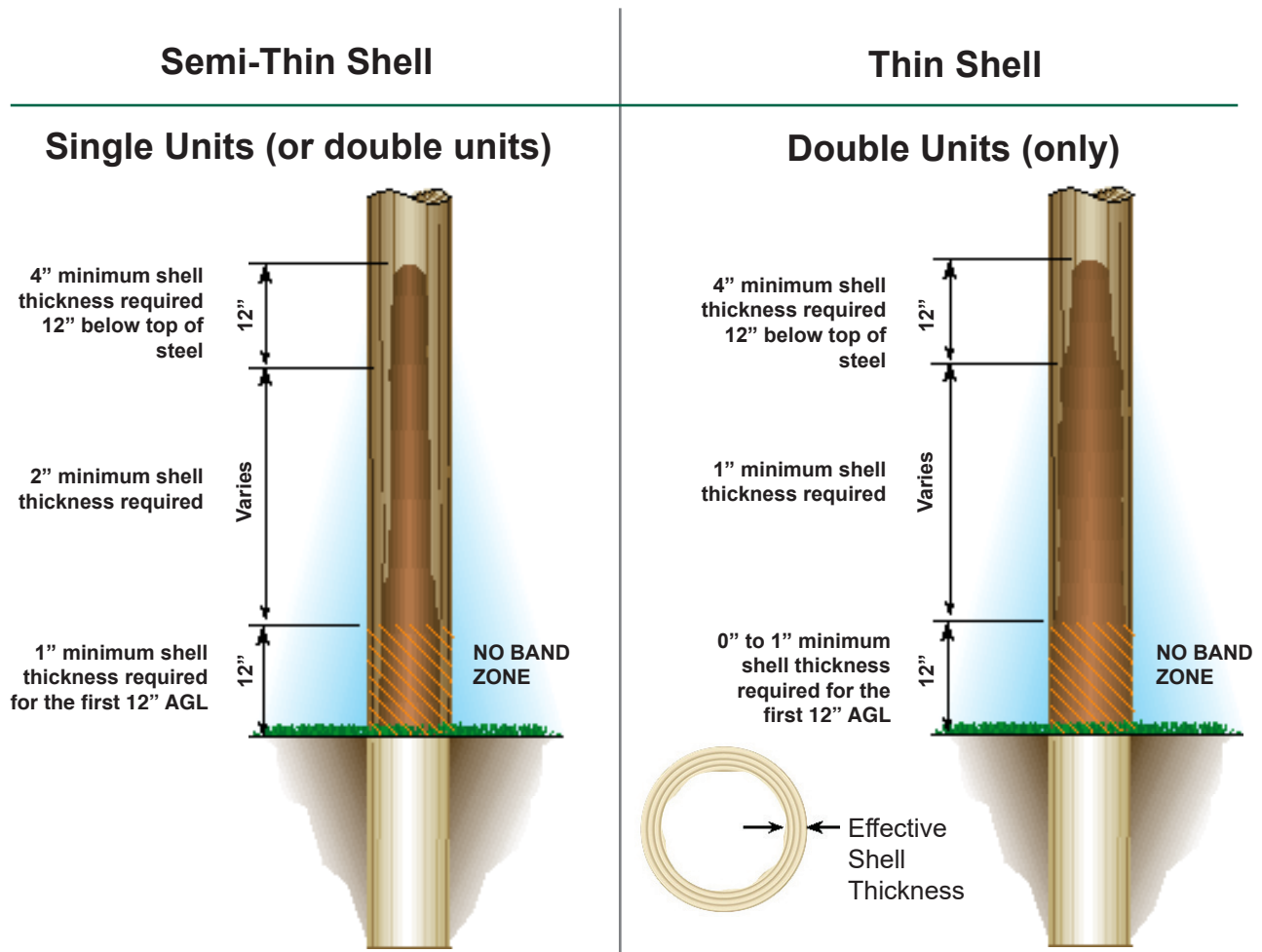
4. Inspection

The condition of poles shall be determined by the standard ground line inspection method which includes sounding and boring. Sufficient borings shall be made so that all interior decay above ground is located. A pole is a candidate for reinforcing if the following criteria are met:

- a. Minimum shell thicknesses shall be per illustration 4a.

Illustration 4a

MINIMUM SHELL THICKNESS

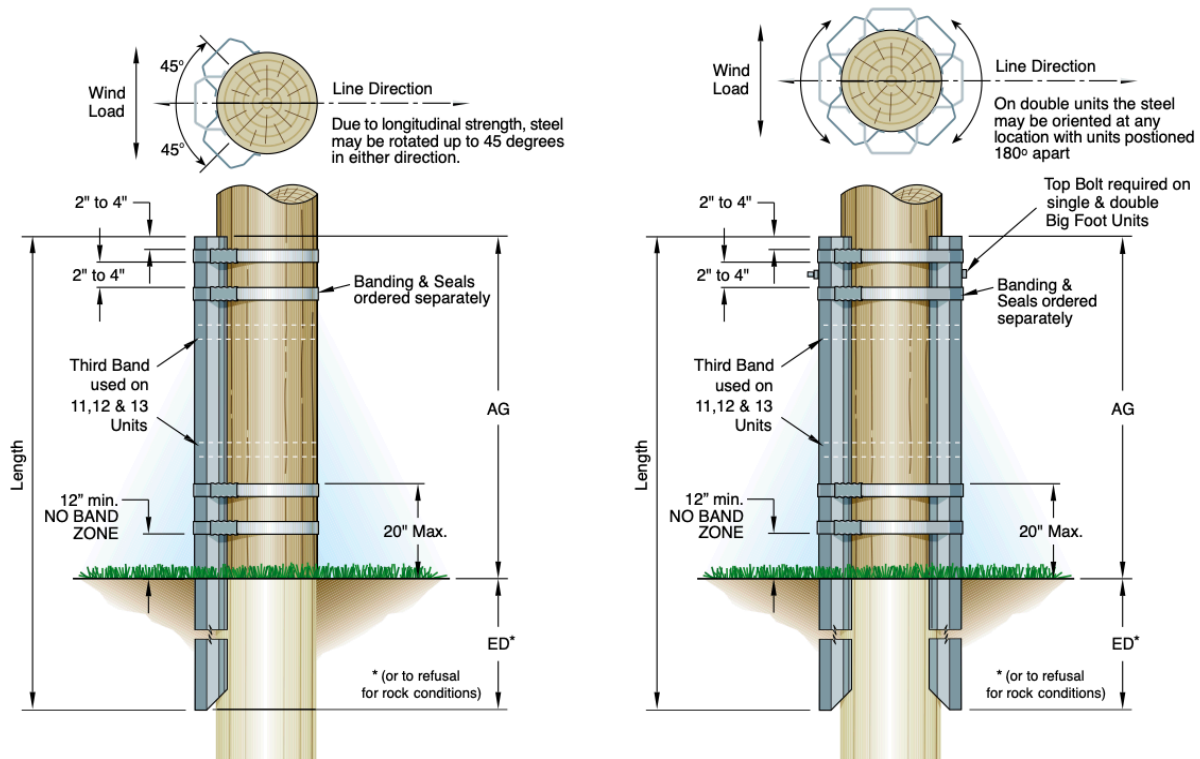


5. Material Requirements

- a. PoleEnforcer® units shall be fabricated of either 60,000 P.S.I. or 80,000 P.S.I. tensile strength steel and galvanized per ASTM Standard A-123. See illustration 5a for PoleEnforcer material strength chart.
- b. A minimum of four heavy duty galvanized straps 2" x .044" per pole - (12,000 lbs. Ultimate Tensile Strength, 138,000 psi.) per band. See illustration 5a for number and locations. (Tested per ASTM D3953).
- c. Four 4-1/2" heavy duty galvanized seals per pole (one per band). (Tested per ASTM D3953).

Illustration 5a

SINGLE & DOUBLE UNIT INSTALLATION



POLEENFORCER® STRENGTH CHART

	PoleEnforcer® Unit Number	Ultimate Transverse Strength (Ft.-Lbs.)		Ultimate Longitudinal Strength (ft - lbs) Single Unit	Unit Dimensions			E D* Embedment Depth (ft)	A G Above Ground (ft)	Unit Weight (Lbs.) Single Unit
		Single Unit	Double Unit		Width (in)	Leng (ft)	Thickness (in)			
80ksi A-656 Grade 80 Steel	PE - 27 - 10	27,600	55,200	15,000	5.500	10	0.1875	5.0	5.0	85
	PE - 37 - 10	37,900	75,800	22,000	6.250	10	0.1875	5.0	5.0	101
	PE - 51 - 10	51,000	102,000	28,000	7.375	10	0.1875	5.0	5.0	115
	PE - 58 - 10	58,600	117,200	30,000	7.750	10	0.1875	5.0	5.0	124
	PE - 73 - 10	73,500	147,000	35,000	9.000	10	0.1875	5.0	5.0	136
	7 - 10 - 5	78,300	156,600	49,000	7.000	10	0.3125	5.0	5.0	180
	8 - 11 - 5	91,700	183,400	56,000	8.000	11	0.312	5.5	5.5	210
	9 - 11 - 4	85,200	170,400	47,000	9.000	11	0.2500	5.5	5.5	179
	9 - 11 - 5	108,000	216,000	62,000	9.000	11	0.312	5.5	5.5	222
	9 - 11 - 6	128,600	257,200	72,000	9.000	11	0.375	6.0	5.0	266
	10 - 11 - 5	123,700	247,400	69,000	10.000	11	0.312	6.0	5.0	234
	10 - 11 - 6	148,100	296,200	80,000	10.000	11	0.375	6.0	5.0	286
	11 - 11 - 6	169,500	339,000	87,000	11.000	11	0.3750	6.0	5.0	294
12 - 12 - 6	191,500	383,000	95,000	12.000	12	0.3750	6.0	6.0	337	
13 - 12 - 6	211,500	423,000	103,000	13.000	12	0.3750	6.0	6.0	352	

All PoleEnforcers are hot dip galvanized per ASTM A-123 specifications. *Longer lengths or SRS® units are available for higher decay applications.

6. Installation

- a. Installation shall be per illustration 5a.
- b. Poles having electric or telephone underground cables shall be carefully evaluated before reinforcing.
- c. Care shall be taken on poles having ground wires or ground rods so as to prevent damaging or cutting them.
- d. Poles specified for reinforcing which subsequently cannot be reinforced due to inaccessibility, or other factors shall be reported to the company on the report for that week.
- e. Care shall be taken that PoleEnforcer® units and bands are not left with sharp corners or edges which might cause injury.
- f. Where two reinforcers are specified, they shall be placed opposite each other (180 to 135 degrees apart).

7. Future Inspections

The condition of the pole and the condition of the steel reinforcement system shall be included with the utility's normal wood pole inspection cycle.

The following selection guides show the “Minimum” size for units for both NESC Grade “B” and “C” construction. Large units may be used to minimize inventory of steel.

NESC Grade B & C Construction - Per NESC Rule 250B & C/D Restoration Factors (67% & 75%)

Required PoleEnforcer Semi Thin Shell - (Single or Double Units)

Pole Length	Pole Class													
	H6	H5	H4	H3	H2	H1	1	2	3	4	5	6	7	9
20 ft.							PE-51-10	PE-37-10	PE-37-10	PE-27-10	PE-27-10	PE-27-10	PE-27-10	PE-27-10
25 ft.							PE-58-10	PE-51-10	PE-37-10	PE-37-10	PE-27-10	PE-27-10	PE-27-10	PE-27-10
30 ft.							PE-73-10	PE-58-10	PE-51-10	PE-37-10	PE-37-10	PE-27-10	PE-27-10	PE-27-10
35 ft.					10-11-5	9-11-5	9-11-4	PE-73-10	PE-58-10	PE-51-10	PE-37-10	PE-27-10	PE-27-10	
40 ft.			12-12-6	11-11-6	10-11-6	10-11-5	9-11-5	9-11-4	PE-73-10	PE-58-10	PE-51-10	PE-37-10		
45 ft.	10-11-6D	10-11-5D	9-11-5D	12-12-6	11-11-6	10-11-6	10-11-5	8-11-5	PE-73-10	PE-58-10	PE-51-10	PE-37-10		
50 ft.	11-11-6D	10-11-6D	10-11-5D	13-12-6	12-12-6	10-11-6	10-11-5	9-11-5	9-11-4	PE-73-10	PE-58-10			
55 ft.	12-12-6D	11-11-6D	10-11-6D	10-11-5D	13-12-6	11-11-6	10-11-6	10-11-5	8-11-5	PE-73-10				
60 ft.	12-12-6D	11-11-6D	10-11-6D	9-11-6D	9-11-5D	12-12-6	11-11-6	10-11-5	9-11-5	9-11-4				
65 ft.	13-12-6D	12-12-6D	11-11-6D	10-11-6D	10-11-5D	13-12-6	11-11-6	10-11-6	10-11-5	8-11-5				
70 ft.			13-12-6D	11-11-6D	10-11-6D	10-11-5D	13-12-6	11-11-6	10-11-6	9-11-5				
75 ft.			13-12-6D	12-12-6D	11-11-6D	9-11-6D	9-11-5D	12-12-6	10-11-6					
80 ft.				12-12-6D	11-11-6D	10-11-6D	10-11-5D	12-12-6	11-11-6					
85 ft.				13-12-6D	12-12-6D	10-11-6D	10-11-5D	13-12-6	11-11-6					
90 ft.					12-12-6D	11-11-6D	10-11-6D	9-11-5D	12-12-6					
95 ft.					13-12-6D	11-11-6D	10-11-6D	10-11-5D						
100 ft.					13-12-6D	12-12-6D	10-11-6D	10-11-5D						
105 ft.						12-12-6D	11-11-6D	9-11-6D						
110 ft.						13-12-6D	11-11-6D	10-11-6D						
115 ft.						13-12-6D	11-11-6D	10-11-6D						
120 ft.						13-12-6D	12-12-6D	10-11-6D						
125 ft.							12-12-6D	11-11-6D						

NESC Grade B & C Construction - Per NESC Rule 250B & C/D Restoration Factors (67% & 75%)

Required PoleEnforcer - Thin Shell - (Double Units Only)

Pole Length	Pole Class													
	H6	H5	H4	H3	H2	H1	1	2	3	4	5	6	7	9
20 ft.							PE-27-10D	PE-27-10D	PE-27-10D	PE-27-10D	PE-27-10D	PE-27-10D	PE-27-10D	PE-27-10D
25 ft.							PE-27-10D	PE-27-10D	PE-27-10D	PE-27-10D	PE-27-10D	PE-27-10D	PE-27-10D	PE-27-10D
30 ft.							PE-37-10D	PE-37-10D	PE-27-10D	PE-27-10D	PE-27-10D	PE-27-10D	PE-27-10D	PE-27-10D
35 ft.					PE-73-10D	PE-51-10D	PE-51-10D	PE-37-10D	PE-27-10D	PE-27-10D	PE-27-10D	PE-27-10D	PE-27-10D	
40 ft.			9-11-5D	9-11-4D	PE-73-10D	PE-58-10D	PE-51-10D	PE-51-10D	PE-37-10D	PE-27-10D	PE-27-10D	PE-27-10D		
45 ft.	10-11-6D	10-11-5D	9-11-5D	8-11-5D	7-10-5D	PE-73-10D	PE-58-10D	PE-51-10D	PE-37-10D	PE-37-10D	PE-27-10D	PE-27-10D		
50 ft.	11-11-6D	10-11-6D	10-11-6D	9-11-5D	8-11-5D	7-10-5D	PE-73-10D	PE-51-10D	PE-51-10D	PE-37-10D	PE-27-10D			
55 ft.	12-12-6D	11-11-6D	10-11-6D	10-11-5D	9-11-5D	9-11-4D	PE-73-10D	PE-58-10D	PE-51-10D	PE-37-10D				
60 ft.	12-12-6D	11-11-6D	10-11-6D	9-11-6D	9-11-5D	8-11-5D	7-10-5D	PE-73-10D	PE-51-10D	PE-51-10D				
65 ft.	13-12-6D	12-12-6D	11-11-6D	10-11-6D	10-11-5D	9-11-5D	9-11-4D	PE-73-10D	PE-58-10D	PE-51-10D				
70 ft.			13-12-6D	11-11-6D	10-11-6D	10-11-5D	9-11-5D	9-11-4D	PE-73-10D	PE-58-10D				
75 ft.			13-12-6D	12-12-6D	11-11-6D	9-11-6D	9-11-5D	8-11-5D	PE-73-10D					
80 ft.				12-12-6D	11-11-6D	10-11-6D	10-11-5D	9-11-5D	7-10-5D					
85 ft.				13-12-6D	12-12-6D	10-11-6D	10-11-5D	9-11-5D	9-11-4D					
90 ft.					12-12-6D	11-11-6D	10-11-6D	9-11-5D	8-11-5D					
95 ft.					13-12-6D	11-11-6D	10-11-6D	10-11-5D						
100 ft.					13-12-6D	12-12-6D	10-11-6D	10-11-5D						
105 ft.						12-12-6D	11-11-6D	9-11-6D						
110 ft.						13-12-6D	11-11-6D	10-11-6D						
115 ft.						13-12-6D	11-11-6D	10-11-6D						
120 ft.						13-12-6D	12-12-6D	10-11-6D						
125 ft.							12-12-6D	11-11-6D						