

# LWS

LAMINATED WOOD SYSTEMS

## E-LAM<sup>®</sup>

### TECHNICAL DATA

- INSTALLATION RECOMMENDATIONS
- PRESERVATIVE TREATMENT
- HARDWARE OPTIONS
- RAKED POLE STANDARD SIZES
- TANGENT POLE STANDARD SIZES
- FOUNDATION SYSTEMS
- UNGLUED EDGE JOINT
- SPECIFICATIONS

View the E-LAM<sup>®</sup>  
installation video online  
at: [www.lwsinc.com](http://www.lwsinc.com)



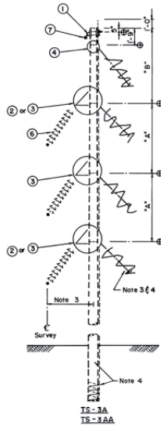
# RAKED STRUCTURE DESIGN CRITERIA WORKSHEET

Scan and email to: [engineering@lwsinc.com](mailto:engineering@lwsinc.com) or submit online at [www.lwsinc.com](http://www.lwsinc.com)

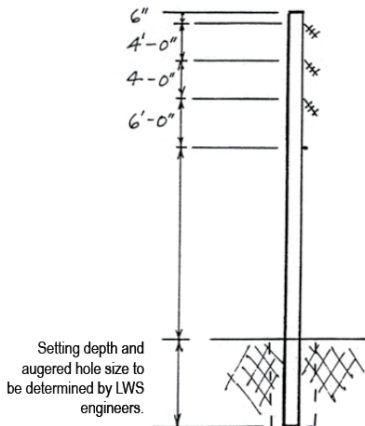
By providing our engineering department with pertinent design details and criteria, we can specify the raked poles suited to meet your pole and loading requirements

**NOTE: Use this form for Joint Use Structure information as well.**

## PLEASE ATTACH YOUR DRAWING(S) SUCH AS:



## AND/OR A SKETCH SUCH AS:



Customer Name \_\_\_\_\_

Contact Name \_\_\_\_\_

Project Name \_\_\_\_\_

Project Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_

Email \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Construction Type \_\_\_\_\_

Line Voltage(s) \_\_\_\_\_

Number of Conductors \_\_\_\_\_ Conductor Size \_\_\_\_\_

Number of Neutral/Shield Wires \_\_\_\_\_ Neut/SW Size \_\_\_\_\_

Conductor Maximum Design Tension (lbs.) \_\_\_\_\_

60 Degree Farenheit Tension - Conductor (lbs.) \_\_\_\_\_

Neutral/Shield Wire Maximum Design Tension (lbs.) \_\_\_\_\_

60 Degree Farenheit Tension - Neutral/Shield (lbs.) \_\_\_\_\_

Maximum Span (feet) \_\_\_\_\_

Line Angle (degrees) \_\_\_\_\_

Pole Height (above ground) \_\_\_\_\_

Typical Soil Type \_\_\_\_\_

Loading Conditions \_\_\_\_\_

*(Example - NESC Heavy Loading, Grade B Construction)*

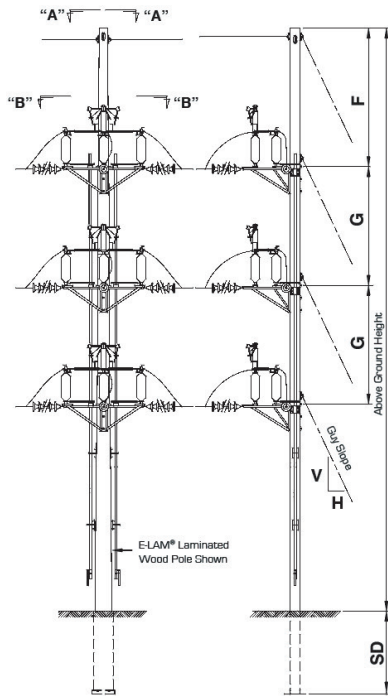
Additional Comments \_\_\_\_\_

*(Example - cable TV, telephone, etc.)*

# SWITCH STRUCTURE INFORMATION WORKSHEET

Scan and email to: [engineering@lwsinc.com](mailto:engineering@lwsinc.com) or submit online at [www.lwsinc.com](http://www.lwsinc.com)

Use this form to provide LWS engineers information regarding your switch structure requirements. BE SURE TO FILL OUT ALL FIELDS SHADED IN BLUE. All of this information is required to accurately specify the correct E-LAM® pole for your application.



## FOUNDATION DETAIL



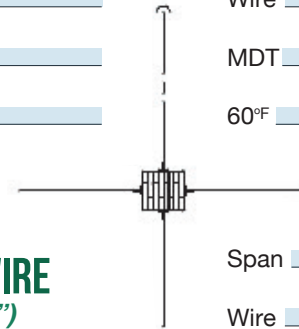
**Foundation Diameter**  
(Based on a Class social type)

Switch Manufacturer

Model  Serial/Order No.

Pole Length	Setting Depth (SD)	Above Ground Height	F	G	V	H
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Span <input type="text"/>	Span <input type="text"/>
Wire <input type="text"/>	Wire <input type="text"/>
MDT <input type="text"/>	MDT <input type="text"/>
60°F <input type="text"/>	60°F <input type="text"/>

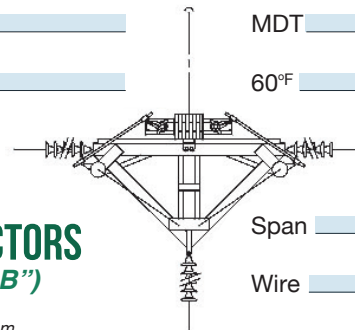


## SHIELD WIRE (view "A-A")

MDT = Maximum Design Tension  
60°F = Tension at 60°F

Span <input type="text"/>
Wire <input type="text"/>
MDT <input type="text"/>
60°F <input type="text"/>

Span <input type="text"/>	Span <input type="text"/>
Wire <input type="text"/>	Wire <input type="text"/>
MDT <input type="text"/>	MDT <input type="text"/>
60°F <input type="text"/>	60°F <input type="text"/>



## CONDUCTORS (view "B-B")

MDT = Maximum Design Tension  
60°F = Tension at 60°F

Span <input type="text"/>
Wire <input type="text"/>
MDT <input type="text"/>
60°F <input type="text"/>

# SUBSTATION DEAD END STRUCTURE WORKSHEET

Use this form to provide LWS engineers the necessary information regarding your substation dead end structure requirements. BE SURE TO FILL OUT ALL FIELDS. All of this information is required to accurately specify the correct E-LAM® structure for your application.

## STRUCTURE INFORMATION

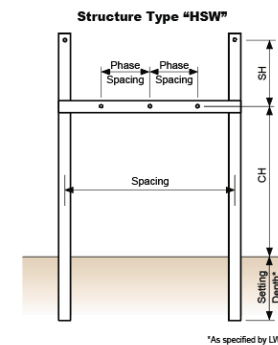
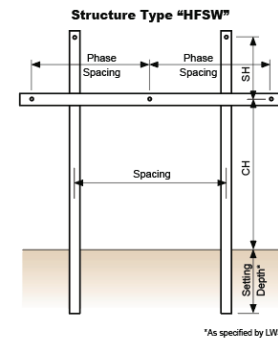
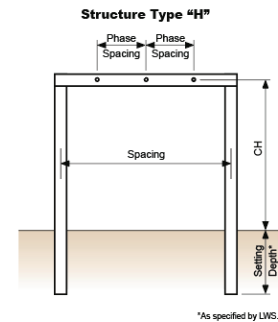
Structure Type \_\_\_\_\_ “H” \_\_\_\_\_ “HSW” \_\_\_\_\_ “HFSW” \_\_\_\_\_ Other: \_\_\_\_\_

Soil Type \_\_\_\_\_ Loading) \_\_\_\_\_  
*(Example - NESC Heavy Grade “B”)*

Line Voltage \_\_\_\_\_ Line Angle \_\_\_\_\_

Spacing (feet) \_\_\_\_\_ Phase Spacing (feet) \_\_\_\_\_

“CH” (feet) \_\_\_\_\_ “SH” (feet) \_\_\_\_\_



## SHIELD WIRE INFORMATION

Shield Wire \_\_\_\_\_ Wind Span (feet) \_\_\_\_\_

Max. Design Tension (lbs.) \_\_\_\_\_ Weight Span (feet) \_\_\_\_\_

60° Tension (lbs.) \_\_\_\_\_ No. of Shield Wires \_\_\_\_\_

## SHIELD WIRE INFORMATION

Shield Wire \_\_\_\_\_ Wind Span (feet) \_\_\_\_\_

Max. Design Tension (lbs.) \_\_\_\_\_ Weight Span (feet) \_\_\_\_\_

60° Tension (lbs.) \_\_\_\_\_ No. of Shield Wires \_\_\_\_\_

# JOINT USE & TELECOM STRUCTURE WORKSHEET

*NOTE: This form to be used for antenna loading information on Joint Use & Telecom structures. Use the Raked Structure form on page 2 to submit Joint-Use utility structure loading information.*

Customer Name \_\_\_\_\_ Site Name \_\_\_\_\_  
 Site Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_  
 Contact \_\_\_\_\_ Phone \_\_\_\_\_ Fax \_\_\_\_\_  
 Pole Height (above ground) \_\_\_\_\_ feet Design Wind Speed \_\_\_\_\_ M.P.H. Radial Ice \_\_\_\_\_ inches  
 Soils Report Available \_\_\_\_\_ Yes \_\_\_\_\_ No If "no" please describe soil type \_\_\_\_\_  
 Picture of Proposed Site Available \_\_\_\_\_ Yes \_\_\_\_\_ No If "no" please describe surrounding area \_\_\_\_\_

## STRUCTURE INFORMATION

Mfg/Model No.	Quantity	RAD Center	Azimuth
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Sectorized antenna arms? \_\_\_\_\_ Yes \_\_\_\_\_ No Centerline elevation \_\_\_\_\_ feet  
 Horizontal separation per antenna \_\_\_\_\_ feet  
 Sectorized antenna arms? \_\_\_\_\_ Yes \_\_\_\_\_ No Centerline elevation \_\_\_\_\_ feet  
 Horizontal separation per antenna \_\_\_\_\_ feet "Close mount" brackets? \_\_\_\_\_ Yes \_\_\_\_\_ No  
 Twist/sway deflection requirements \_\_\_\_\_ degrees (at 50 M.P.H. operational wind speed)

## MICROWAVE ANTENNAS

Mfg/Model No.	Quantity	RAD Center	Azimuth
_____	_____	_____	_____

Twist/sway deflection requirements \_\_\_\_\_ degrees (at 50 M.P.H., operational wind speed.)

## OPTIONS

Cable Covers - Metal 8" x 9" \_\_\_\_\_ Metal 3" x 911 \_\_\_\_\_ or Laminated Wood \_\_\_\_\_ (holds 12 - 1 1/2" cables)  
 Bracket Paint Color \_\_\_\_\_ Brown or \_\_\_\_\_ Green \_\_\_\_\_ Pole Steps \_\_\_\_\_ removable or \_\_\_\_\_ non-removable  
 Internal Raceway (5" x 7 1/4") \_\_\_\_\_ Chamfered Pole Corners (4" bevel) \_\_\_\_\_ Safety Cable Assembly \_\_\_\_\_  
 Pole Drawings \_\_\_\_\_ /Calculations \_\_\_\_\_ Other Requests \_\_\_\_\_

# INSTALLING E-LAM® FIELD RAKED LAMINATED WOOD STRUCTURES

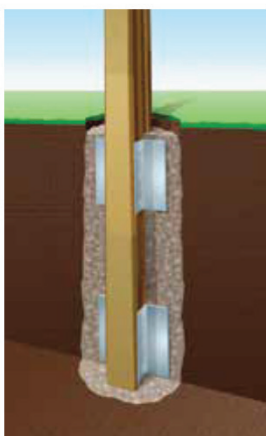
## IDENTIFICATION OF POLES

Each E-LAM® laminated wood pole is tagged with the class and length on the face and the butt. If a variety of poles are required on a project, make sure the appropriate pole is spotted at the correct structure location. Additionally, poles of the same class may be drilled for different structures, and verification of structure types should also be confirmed.

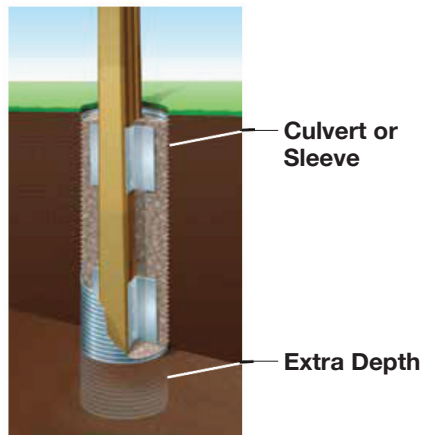
## VERIFY AND ASSEMBLE APPROPRIATE FOUNDATION REINFORCEMENT SYSTEM

Field raked poles are drilled for and furnished with a foundation reinforcement system. The foundation systems, consisting of fabricated galvanized angles and assembly bolts, are shipped separate from the poles and need to be located and assembled prior to setting. The assemblies are application specific and require verification as to which system is used per structure location. Our staff will assist the user in determining which foundation system is appropriate for each installation based on loading and soil conditions provided by the owner. A “standard” foundation system for each pole class can be found with the Ultimate Groundline Moment information in the catalog. The actual foundation system that is supplied could vary from the “standard” because of site conditions. Where poor soil conditions exist, steel or concrete sleeves (culverts) may be required.

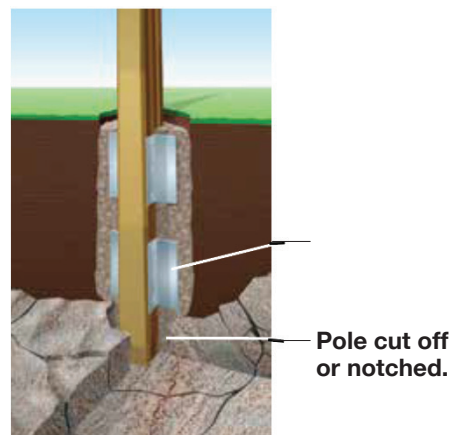
*NOTE: It is always the ultimate decision of the owner to accept final responsibility for the foundation and setting requirements.*



STANDARD FOUNDATION FOR TYPICAL SOIL TYPE CLASS 5



STANDARD FOUNDATION FOR SOFT SOIL INSTALLATIONS

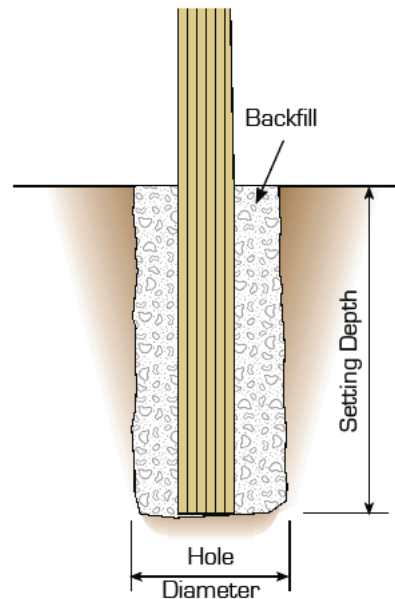


## AUGER SIZE

The size of the hole is unique to the type of soil and loading for each individual installation. Laminated Wood Systems will develop specific information or tables based on the design information supplied by the utility at time of order placement.

## SETTING DEPTH

The setting depth of each installation has been identified prior to manufacturing (typically 10% of the nominal length plus 4 feet). Individual soil types should be confirmed to verify the setting depth.



## LIFTING

All poles are identified with “BP” on the face of the width (constant dimension) to identify the approximate balance point before any framing materials are added. The approximate weight of the treated pole will also be located at this point. The poles should be lifted with a steel choker or gut line rather than a flat nylon strap. The choker will slightly indent the edges on the radiused corners insuring a firm hold without slipping.



## HANDLING

Poles can be handled just like any other wood pole. If rotation is required to bisect the angle, a regular cant hook for round poles can be used. Any field drilling and preservative treatment application should be consistent with the practice for other wood products acceptable to the individual utility.



**Adjust and align structure using a cant hook or similar tool.**

*These are general recommendations and in no way should be given precedence when they come in conflict with an individual utility's accepted and established working practice.*

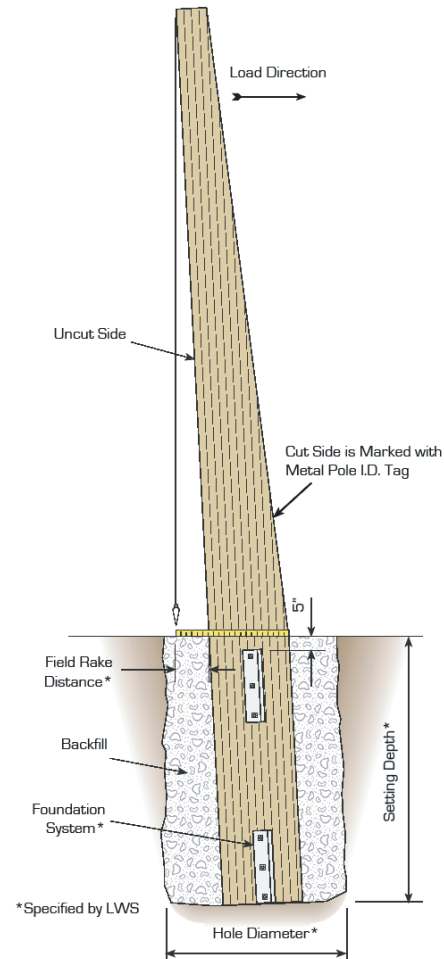
## SETTING RECOMMENDATIONS

Follow general installation and handling recommendations as described on previous page. Install appropriate foundation system and auger hole to diameter and depth as recommended by LWS.

**Raking:** The field rake amount is typically designed to resist the 60°F load which is induced by the line angle or dead-end. The field rake amount will be calculated by the LWS engineering staff. A maximum field rake of 3% of the above-ground height is recommended on any installation.

**Angle:** In most cases, the pole needs to be oriented so the face of the pole bisects the line angle equally.

**Plumbing:** The back face of each pole has a straight edge which can be used for plumbing and raking the pole. A field raking detail is included within the drawings for each field raked pole.

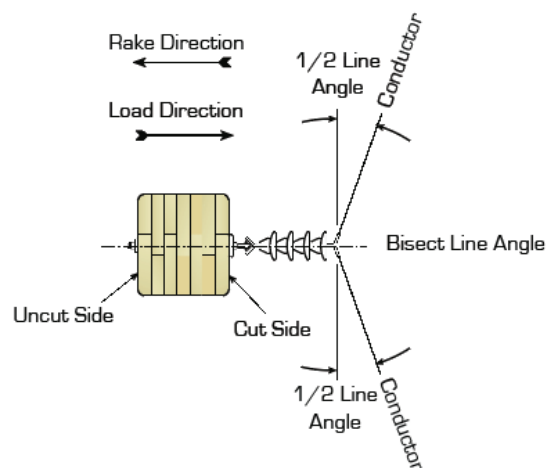


## BACKFILL

Compacted aggregate tamped in 6" lifts, slurry, or concrete should be used. Native soil shall not be used.

## TENSIONING

After pulling the conductor and/or shield wires to "every day" design tensions, allow the poles to set for a minimum of 30 minutes to reach a point of equilibrium. Verify tensions or bring back to design loads prior to clipping.

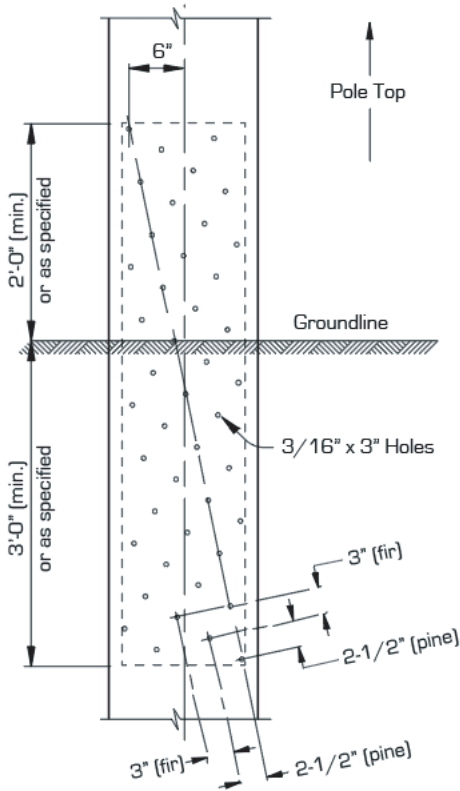
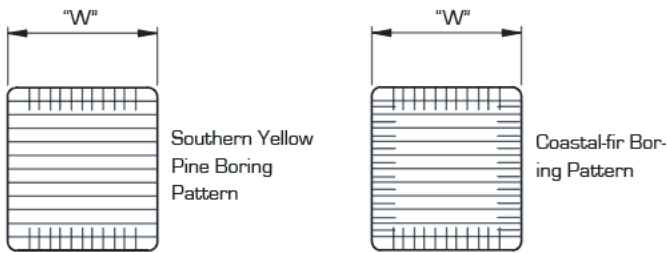




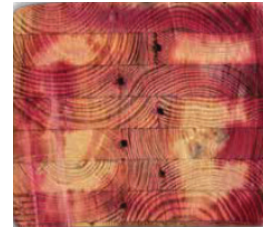
# PRESERVATIVE TREATMENT

All poles are treated in accordance with AWPA specification M2, and especially U1 Commodity Specification D, and T1 Section D, use category 4C. The most common treatment is penta & oil, and DCOI. CCA and copper naphthenate can also be used upon request.

## STANDARD GROUNDLINE DEEP BORING FOR SOUTHERN PINE & COASTAL FIR E-LAM POLES (PRIOR TO TREATMENT)



**PentaTrate®** Patented edge joint grooves allow for full-length penetration of preservative in the inner zone of multiple-layup poles.



Typical treatment penetration throughout entire length of the pole.



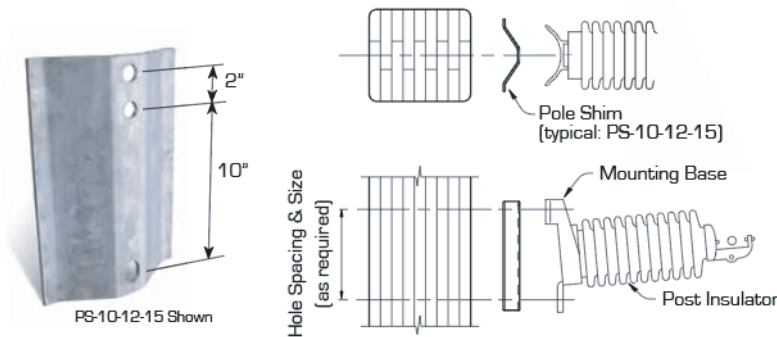
Groundline deep boring.

# HARDWARE OPTIONS

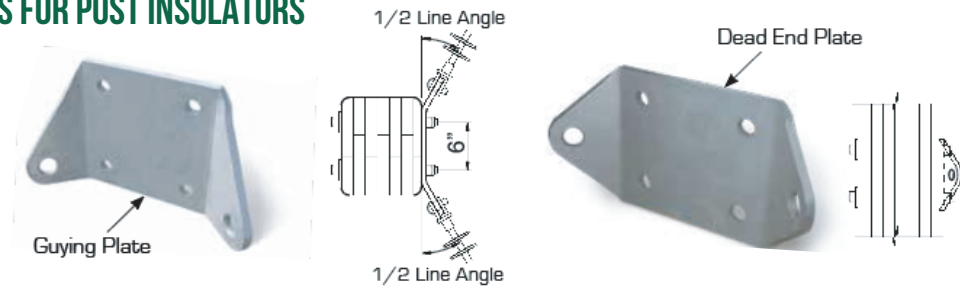
All E-LAM® structures come with premium packaged hardware kits that include all foundation angles, mounting hardware, material list and engineering drawings. Crates are clearly marked with structure numbers & customer information.



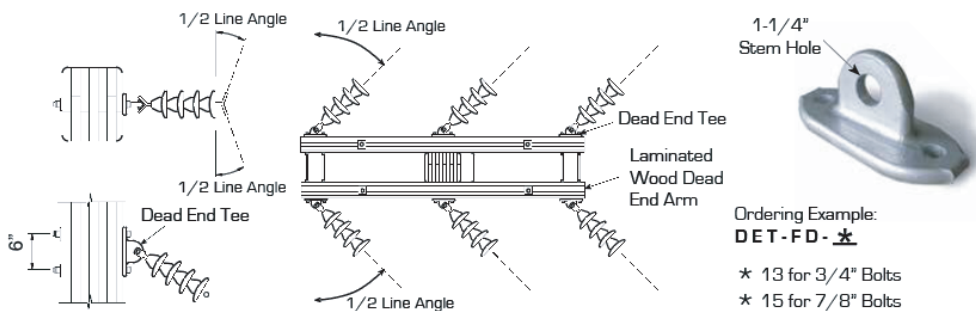
## POLE SHIMS FOR POST INSULATORS



## POLE SHIMS FOR POST INSULATORS



## POLE SHIMS FOR POST INSULATORS



Ordering Example:  
**DET-FD-\***

- \* 13 for 3/4" Bolts
- \* 15 for 7/8" Bolts



# RAKED POLE STANDARD SIZES

SOUTHERN YELLOW PINE

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**32FT - 107FT**

LARGER SIZES AVAILABLE AS REQUIRED

*View the E-LAM® installation  
video online at: [www.lwsinc.com](http://www.lwsinc.com)*

# E-LAM® SOUTHERN YELLOW PINE RAKED POLES

32 FT.		SOUTHERN YELLOW PINE					Approx. Treated Weight (lbs.)	Ultimate Groudl ine Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
PELR-4-32	6 ¾	6 ½	9 ⅝	32	7.5	582	66	
PELR-3-32	6 ¾	6 ½	11	32	7.5	640	86	
PELR-2-32	6 ¾	6 ½	12 ¾	32	7.5	699	109	
PELR-1-32	6 ¾	7 ½	13 ¾	32	7.5	784	135	
PELR-H1-32	6 ¾	7 ½	15 ⅞	32	7.5	842	163	
PELR-H2-32	6 ¾	7 ½	16 ½	32	7.5	901	193	
PELR-H3-32	6 ¾	8	17 ⅞	32	7.5	973	225	
PELR-H4-32	6 ¾	9	19 ¼	32	7.5	1,058	259	
PELR-H5-32	6 ¾	10	20 ⅝	32	7.5	1,142	295	
PELR-H6-32	6 ¾	11	22	32	7.5	1,227	334	
PELR-H7-32	6 ¾	12	23 ¾	32	7.5	1,312	375	
PELR-H8-32	6 ¾	12	24 ¾	32	7.5	1,371	418	
PELR-H9-32	8 ½	13	24 ¾	32	7.5	1,760	526	
PELR-H10-32	8 ½	13	26 ⅞	32	7.5	1,833	583	
PELR-H11-32	8 ½	14	27 ½	32	7.5	1,940	643	
PELR-H12-32	8 ½	14	28 ⅞	32	7.5	2,014	705	
PELR-H13-32	8 ½	15	30 ¼	32	7.5	2,121	770	
PELR-H14-32	8 ½	15	31 ⅝	32	7.5	2,195	838	
PELR-H15-32	8 ½	16	33	32	7.5	2,302	909	
PELR-H16-32	8 ½	16	34 ¾	32	7.5	2,376	982	

37 FT.		YELLOW SOUTHERN PINE					Approx. Treated Weight (lbs.)	Ultimate Groudl ine Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
PELR-4-37	6 ¾	6 ½	9 ⅝	37	8	670	66	
PELR-3-37	6 ¾	6 ½	11	37	8	737	86	
PELR-2-37	6 ¾	6 ½	12 ¾	37	8	804	109	
PELR-1-37	6 ¾	7 ½	13 ¾	37	8	902	135	
PELR-H1-37	6 ¾	7 ½	15 ⅞	37	8	968	163	
PELR-H2-37	6 ¾	7 ½	16 ½	37	8	1,035	193	
PELR-H3-37	6 ¾	8	17 ⅞	37	8	1,117	225	
PELR-H4-37	6 ¾	9	19 ¼	37	8	1,215	259	
PELR-H5-37	6 ¾	10	20 ⅝	37	8	1,313	295	
PELR-H6-37	6 ¾	11	22	37	8	1,411	334	
PELR-H7-37	6 ¾	12	23 ¾	37	8	1,509	375	
PELR-H8-37	6 ¾	12	24 ¾	37	8	1,576	418	
PELR-H9-37	8 ½	13	24 ¾	37	8	2,024	526	
PELR-H10-37	8 ½	13	26 ⅞	37	8	2,108	583	
PELR-H11-37	8 ½	14	27 ½	37	8	2,231	643	
PELR-H12-37	8 ½	14	28 ⅞	37	8	2,315	705	
PELR-H13-37	8 ½	15	30 ¼	37	8	2,439	770	
PELR-H14-37	8 ½	15	31 ⅝	37	8	2,523	838	
PELR-H15-37	8 ½	16	33	37	8	2,646	909	
PELR-H16-37	8 ½	16	34 ¾	37	8	2,730	982	

42 FT.		SOUTHERN YELLOW PINE					Approx. Treated Weight (lbs.)	Ultimate Groudl ine Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
PELR-4-42	6 ¾	6 ½	11	42	8	831	86	
PELR-3-42	6 ¾	6 ½	12 ¾	42	8	905	109	
PELR-2-42	6 ¾	6 ½	13 ¾	42	8	979	135	
PELR-1-42	6 ¾	7 ½	15 ⅞	42	8	1,090	163	
PELR-H1-42	6 ¾	7 ½	16 ½	42	8	1,164	193	
PELR-H2-42	6 ¾	7 ½	17 ⅞	42	8	1,238	225	
PELR-H3-42	6 ¾	8	19 ¼	42	8	1,331	259	
PELR-H4-42	6 ¾	9	20 ⅝	42	8	1,442	295	
PELR-H5-42	6 ¾	10	22	42	8	1,553	334	
PELR-H6-42	6 ¾	11	23 ¾	42	8	1,663	375	
PELR-H7-42	6 ¾	12	24 ¾	42	8	1,774	418	
PELR-H8-42	6 ¾	12	24 ¾	42	8	2,234	526	
PELR-H9-42	8 ½	13	26 ⅞	42	8	2,373	583	
PELR-H10-42	8 ½	13	27 ½	42	8	2,467	643	
PELR-H11-42	8 ½	14	28 ⅞	42	8	2,606	705	
PELR-H12-42	8 ½	14	30 ¼	42	8	2,700	770	
PELR-H13-42	8 ½	15	31 ⅝	42	8	2,839	838	
PELR-H14-42	8 ½	15	33	42	8	2,933	909	
PELR-H15-42	8 ½	16	34 ¾	42	8	3,072	982	
PELR-H16-42	8 ½	16	35 ¾	42	8	3,165	1,058	

47 FT.		SOUTHERN YELLOW PINE					Approx. Treated Weight (lbs.)	Ultimate Groudl ine Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
PELR-4-47	8 ½	6 ½	11	47	8.5	1,169	109	
PELR-3-47	8 ½	6 ½	12 ¾	47	8.5	1,272	137	
PELR-2-47	8 ½	6 ½	13 ¾	47	8.5	1,428	170	
PELR-1-47	8 ½	7 ½	15 ⅞	47	8.5	1,532	205	
PELR-H1-47	8 ½	7 ½	16 ½	47	8.5	1,635	244	
PELR-H2-47	8 ½	7 ½	17 ⅞	47	8.5	1,739	284	
PELR-H3-47	8 ½	8	19 ¼	47	8.5	1,869	326	
PELR-H4-47	8 ½	9	20 ⅝	47	8.5	2,024	372	
PELR-H5-47	8 ½	10	22	47	8.5	2,180	421	
PELR-H6-47	8 ½	11	23 ¾	47	8.5	2,336	472	
PELR-H7-47	8 ½	12	24 ¾	47	8.5	2,492	526	
PELR-H8-47	10 ¼	12	24 ¾	47	8.5	3,005	634	
PELR-H9-47	10 ¼	13	26 ⅞	47	8.5	3,193	703	
PELR-H10-47	10 ¼	13	27 ½	47	8.5	3,318	775	
PELR-H11-47	10 ¼	14	28 ⅞	47	8.5	3,506	850	
PELR-H12-47	10 ¼	14	30 ¼	47	8.5	3,631	929	
PELR-H13-47	10 ¼	15	31 ⅝	47	8.5	3,819	1,011	
PELR-H14-47	10 ¼	15	33	47	8.5	3,944	1,096	
PELR-H15-47	10 ¼	16	34 ¾	47	8.5	4,132	1,184	
PELR-H16-47	10 ¼	16	35 ¾	47	8.5	4,257	1,276	

# E-LAM® SOUTHERN YELLOW PINE RAKED POLES

52 FT.		SOUTHERN YELLOW PINE					Approx. Treated Weight (lbs.)	Ultimate Groundline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
PELR-3-52	8 ½	6 ½	12 ¾	52	15	1,404	137	
PELR-2-52	8 ½	6 ½	13 ¾	52	15	1,577	170	
PELR-1-52	8 ½	6 ½	15 ½	52	15	1,690	205	
PELR-H1-52	8 ½	7 ½	16 ½	52	15	1,804	244	
PELR-H2-52	8 ½	7 ½	17 ¾	52	15	1,918	284	
PELR-H3-52	8 ½	8	19 ¼	52	15	2,061	326	
PELR-H4-52	8 ½	9	20 ¾	52	15	2,233	372	
PELR-H5-52	8 ½	10	22	52	15	2,406	421	
PELR-H6-52	8 ½	11	23 ¾	52	15	2,578	472	
PELR-H7-52	8 ½	12	24 ¾	52	15	2,750	526	
PELR-H8-52	10 ¼	12	24 ¾	52	15	3,316	634	
PELR-H9-52	10 ¼	13	26 ½	52	15	3,524	703	
PELR-H10-52	10 ¼	13	27 ½	52	15	3,661	775	
PELR-H11-52	10 ¼	14	28 ¾	52	15	3,869	850	
PELR-H12-52	10 ¼	14	30 ¼	52	15	4,007	929	
PELR-H13-52	10 ¼	15	31 ¾	52	15	4,214	1,011	
PELR-H14-52	10 ¼	15	33	52	15	4,352	1,096	
PELR-H15-52	10 ¼	16	34 ¾	52	15	2,559	1,184	
PELR-H16-52	10 ¼	16	35 ¾	52	15	4,697	1,276	

57 FT.		SOUTHERN YELLOW PINE					Approx. Treated Weight (lbs.)	Ultimate Groundline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
PELR-2-57	8 ½	7 ½	15 ½	57	9.5	1,849	205	
PELR-1-57	8 ½	7 ½	16 ½	57	9.5	1,973	244	
PELR-H1-57	8 ½	7 ½	17 ¾	57	9.5	2,097	284	
PELR-H2-57	8 ½	7 ½	19 ¼	57	9.5	2,222	326	
PELR-H3-57	8 ½	8	20 ¾	57	9.5	2,378	372	
PELR-H4-57	8 ½	9	22	57	9.5	2,567	421	
PELR-H5-57	8 ½	10	23 ¾	57	9.5	2,755	472	
PELR-H6-57	8 ½	11	24 ¾	57	9.5	2,944	526	
PELR-H7-57	10 ¼	12	24 ¾	57	9.5	3,628	634	
PELR-H8-57	10 ¼	12	26 ½	57	9.5	3,777	703	
PELR-H9-57	10 ¼	13	27 ½	57	9.5	4,005	775	
PELR-H10-57	10 ¼	13	28 ¾	57	9.5	4,155	850	
PELR-H11-57	10 ¼	14	30 ¼	57	9.5	4,382	929	
PELR-H12-57	10 ¼	14	31 ¾	57	9.5	4,532	1,011	
PELR-H13-57	10 ¼	15	33	57	9.5	4,759	1,096	
PELR-H14-57	10 ¼	15	34 ¾	57	9.5	4,909	1,184	
PELR-H15-57	10 ¼	16	35 ¾	57	9.5	5,136	1,276	
PELR-H16-57	10 ¼	16	37 ¾	57	9.5	5,286	1,371	

62 FT.		SOUTHERN YELLOW PINE					Approx. Treated Weight (lbs.)	Ultimate Groundline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
PELR-1-62	10 ¼	7 ½	16 ½	62	10	2,583	294	
PELR-H1-62	10 ¼	7 ½	17 ¾	62	10	2,746	342	
PELR-H2-62	10 ¼	7 ½	19 ¼	62	10	2,908	394	
PELR-H3-62	10 ¼	8	20 ¾	62	10	3,112	449	
PELR-H4-62	10 ¼	9	22	62	10	3,359	507	
PELR-H5-62	10 ¼	10	23 ¾	62	10	3,607	569	
PELR-H6-62	10 ¼	11	24 ¾	62	10	3,854	634	
PELR-H7-62	10 ¼	12	26 ½	62	10	4,101	703	
PELR-H8-62	10 ¼	12	27 ½	62	10	4,263	775	
PELR-H9-62	10 ¼	13	28 ¾	62	10	4,510	850	
PELR-H10-62	10 ¼	13	30 ¼	62	10	4,672	929	
PELR-H11-62	10 ¼	14	31 ¾	62	10	4,920	1,011	
PELR-H12-62	10 ¼	14	33	62	10	5,082	1,096	
PELR-H13-62	10 ¼	15	34 ¾	62	10	5,329	1,184	
PELR-H14-62	10 ¼	15	35 ¾	62	10	5,491	1,276	
PELR-H15-62	10 ¼	16	37 ½	62	10	5,738	1,371	
PELR-H16-62	10 ¼	16	38 ½	62	10	5,900	1,469	

67 FT.		SOUTHERN YELLOW PINE					Approx. Treated Weight (lbs.)	Ultimate Groundline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
PELR-1-67	10 ¼	7 ½	16 ½	67	10.5	2,787	294	
PELR-H1-67	10 ¼	7 ½	17 ¾	67	10.5	2,962	342	
PELR-H2-67	10 ¼	7 ½	19 ¼	67	10.5	3,136	394	
PELR-H3-67	10 ¼	8	20 ¾	67	10.5	3,357	449	
PELR-H4-67	10 ¼	9	22	67	10.5	3,624	507	
PELR-H5-67	10 ¼	10	23 ¾	67	10.5	3,891	569	
PELR-H6-67	10 ¼	11	24 ¾	67	10.5	4,158	634	
PELR-H7-67	12 ¼	12	24 ¾	67	10.5	5,080	758	
PELR-H8-67	12 ¼	12	26 ½	67	10.5	5,288	840	
PELR-H9-67	12 ¼	13	27 ½	67	10.5	5,607	926	
PELR-H10-67	12 ¼	13	28 ¾	67	10.5	5,816	1,016	
PELR-H11-67	12 ¼	14	30 ¼	67	10.5	6,135	1,110	
PELR-H12-67	12 ¼	14	31 ¾	67	10.5	6,343	1,208	
PELR-H13-67	12 ¼	15	33	67	10.5	6,662	1,310	
PELR-H14-67	12 ¼	15	34 ¾	67	10.5	6,871	1,415	
PELR-H15-67	12 ¼	16	35 ¾	67	10.5	7,190	1,525	
PELR-H16-67	12 ¼	16	37 ½	67	10.5	7,398	1,638	

# E-LAM® SOUTHERN YELLOW PINE RAKED POLES

72 FT.		SOUTHERN YELLOW PINE					Approx. Treated Weight (lbs.)	Ultimate Groundline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
PELR-1-72	10 ¼	7 ½	16 ½	72	11	2,991	294	
PELR-H1-72	10 ¼	7 ½	17 ⅞	72	11	3,178	342	
PELR-H2-72	10 ¼	7 ½	19 ¼	72	11	3,365	394	
PELR-H3-72	10 ¼	8	20 ⅝	72	11	3,602	449	
PELR-H4-72	10 ¼	9	22	72	11	3,888	507	
PELR-H5-72	10 ¼	10	23 ⅜	72	11	4,175	569	
PELR-H6-72	10 ¼	11	24 ¾	72	11	4,462	634	
PELR-H7-72	12 ¼	12	24 ¾	72	11	5,452	758	
PELR-H8-72	12 ¼	12	26 ⅞	72	11	5,675	840	
PELR-H9-72	12 ¼	13	27 ½	72	11	6,018	926	
PELR-H10-72	12 ¼	13	28 ⅞	72	11	6,241	1,016	
PELR-H11-72	12 ¼	14	30 ¼	72	11	6,583	1,110	
PELR-H12-72	12 ¼	14	31 ⅝	72	11	6,807	1,208	
PELR-H13-72	12 ¼	15	33	72	11	7,149	1,310	
PELR-H14-72	12 ¼	15	34 ⅝	72	11	7,373	1,415	
PELR-H15-72	12 ¼	16	35 ¾	72	11	7,715	1,525	
PELR-H16-72	12 ¼	16	37 ⅞	72	11	7,939	1,638	

77 FT.		SOUTHERN YELLOW PINE					Approx. Treated Weight (lbs.)	Ultimate Groundline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
PELR-1-77	10 ¼	7 ½	17 ⅞	77	11.5	3,394	342	
PELR-H1-77	10 ¼	7 ½	19 ¼	77	11.5	3,593	394	
PELR-H2-77	10 ¼	7 ½	20 ⅝	77	11.5	3,793	449	
PELR-H3-77	10 ¼	8	22	77	11.5	4,045	507	
PELR-H4-77	10 ¼	9	23 ⅜	77	11.5	4,352	569	
PELR-H5-77	10 ¼	10	24 ¾	77	11.5	4,658	634	
PELR-H6-77	12 ¼	11	24 ¾	77	11.5	5,695	758	
PELR-H7-77	12 ¼	12	26 ⅞	77	11.5	6,062	840	
PELR-H8-77	12 ¼	12	27 ½	77	11.5	6,300	926	
PELR-H9-77	12 ¼	13	28 ⅞	77	11.5	6,666	1,016	
PELR-H10-77	12 ¼	13	30 ¼	77	11.5	6,904	1,110	
PELR-H11-77	12 ¼	14	31 ⅝	77	11.5	7,270	1,208	
PELR-H12-77	12 ¼	14	33	77	11.5	7,508	1,310	
PELR-H13-77	12 ¼	15	34 ⅝	77	11.5	7,875	1,415	
PELR-H14-77	12 ¼	15	35 ¾	77	11.5	8,113	1,525	
PELR-H15-77	12 ¼	16	37 ⅞	77	11.5	8,479	1,638	
PELR-H16-77	12 ¼	16	38 ½	77	11.5	8,717	1,756	

82 FT.		SOUTHERN YELLOW PINE					Approx. Treated Weight (lbs.)	Ultimate Groundline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
PELR-1-82	10 ¼	7 ½	19 ¼	82	12	3,822	394	
PELR-H1-82	10 ¼	7 ½	20 ⅝	82	12	4,034	449	
PELR-H2-82	10 ¼	7 ½	22	82	12	4,245	507	
PELR-H3-82	10 ¼	8	23 ⅝	82	12	4,514	569	
PELR-H4-82	10 ¼	9	24 ¾	82	12	4,840	634	
PELR-H5-82	12 ¼	10	24 ¾	82	12	5,922	758	
PELR-H6-82	12 ¼	11	26 ⅞	82	12	6,311	840	
PELR-H7-82	12 ¼	12	27 ½	82	12	6,701	926	
PELR-H8-82	12 ¼	12	28 ⅞	82	12	6,954	1,016	
PELR-H9-82	12 ¼	13	30 ¼	82	12	7,344	1,110	
PELR-H10-82	12 ¼	13	31 ⅝	82	12	7,597	1,208	
PELR-H11-82	12 ¼	14	33	82	12	7,987	1,310	
PELR-H12-82	12 ¼	14	34 ⅝	82	12	8,240	1,415	
PELR-H13-82	12 ¼	15	35 ¾	82	12	8,630	1,525	
PELR-H14-82	12 ¼	15	37 ⅞	82	12	8,882	1,638	
PELR-H15-82	12 ¼	16	38 ½	82	12	9,272	1,756	
PELR-H16-82	12 ¼	16	39 ⅞	82	12	9,525	1,877	

87 FT.		SOUTHERN YELLOW PINE					Approx. Treated Weight (lbs.)	Ultimate Groundline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
PELR-1-87	10 ¼	7 ½	20 ⅝	87	12.5	4,275	449	
PELR-H1-87	10 ¼	7 ½	22	87	12.5	4,498	507	
PELR-H2-87	10 ¼	7 ½	23 ⅝	87	12.5	4,722	569	
PELR-H3-87	10 ¼	8	24 ¾	87	12.5	5,007	634	
PELR-H4-87	12 ¼	9	24 ¾	87	12.5	6,130	758	
PELR-H5-87	12 ¼	10	26 ⅞	87	12.5	6,544	840	
PELR-H6-87	12 ¼	11	27 ½	87	12.5	6,957	926	
PELR-H7-87	12 ¼	12	28 ⅞	87	12.5	7,371	1,016	
PELR-H8-87	12 ¼	12	30 ¼	87	12.5	7,638	1,110	
PELR-H9-87	12 ¼	13	31 ⅝	87	12.5	8,052	1,208	
PELR-H10-87	12 ¼	13	33	87	12.5	8,319	1,310	
PELR-H11-87	12 ¼	14	34 ⅝	87	12.5	8,733	1,415	
PELR-H12-87	12 ¼	14	35 ¾	87	12.5	9,001	1,525	
PELR-H13-87	12 ¼	15	37 ⅞	87	12.5	9,414	1,638	
PELR-H14-87	12 ¼	15	38 ½	87	12.5	9,682	1,756	
PELR-H15-87	12 ¼	16	39 ⅞	87	12.5	10,095	1,877	
PELR-H16-87	12 ¼	16	41 ¼	87	12.5	10,363	2,001	


# E-LAM® SOUTHERN YELLOW PINE RAKED POLES

92 FT.		SOUTHERN YELLOW PINE					Approx. Treated Weight (lbs.)	Ultimate Groudl ine Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
PELR-1-92	12 ¼	7 ½	20 ¾	92	13	5,397	536	
PELR-H1-92	12 ¼	7 ½	22	92	13	5,679	606	
PELR-H2-92	12 ¼	7 ½	23 ¾	92	13	5,962	680	
PELR-H3-92	12 ¼	8	24 ¾	92	13	6,321	758	
PELR-H4-92	12 ¼	9	26 ¾	92	13	6,758	840	
PELR-H5-92	12 ¼	10	27 ½	92	13	7,195	926	
PELR-H6-92	12 ¼	11	28 ¾	92	13	7,632	1,016	
PELR-H7-92	12 ¼	12	30 ¼	92	13	8,069	1,110	
PELR-H8-92	12 ¼	12	31 ¾	92	13	8,352	1,208	
PELR-H9-92	12 ¼	13	33	92	13	8,789	1,310	
PELR-H10-92	12 ¼	13	34 ¾	92	13	9,072	1,415	
PELR-H11-92	12 ¼	14	35 ¾	92	13	9,509	1,525	
PELR-H12-92	12 ¼	14	37 ¾	92	13	9,791	1,638	
PELR-H13-92	12 ¼	15	38 ½	92	13	10,228	1,756	
PELR-H14-92	12 ¼	15	39 ¾	92	13	10,511	1,877	
PELR-H15-92	12 ¼	16	41 ¼	92	13	10,948	2,001	
PELR-H16-92	12 ¼	16	42 ¾	92	13	11,230	2,130	

97 FT.		SOUTHERN YELLOW PINE					Approx. Treated Weight (lbs.)	Ultimate Groudl ine Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
PELR-1-97	12 ¼	7 ½	22	97	13.5	5,982	606	
PELR-H1-97	12 ¼	7 ½	23 ¾	97	13.5	6,279	680	
PELR-H2-97	12 ¼	7 ½	24 ¾	97	13.5	6,576	758	
PELR-H3-97	12 ¼	8	26 ¾	97	13.5	6,955	840	
PELR-H4-97	12 ¼	9	27 ½	97	13.5	7,416	926	
PELR-H5-97	12 ¼	10	28 ¾	97	13.5	7,877	1,016	
PELR-H6-97	12 ¼	11	30 ¼	97	13.5	8,337	1,110	
PELR-H7-97	12 ¼	12	31 ¾	97	13.5	8,798	1,208	
PELR-H8-97	12 ¼	12	33	97	13.5	9,095	1,310	
PELR-H9-97	12 ¼	13	34 ¾	97	13.5	9,556	1,415	
PELR-H10-97	12 ¼	13	35 ¾	97	13.5	9,853	1,525	
PELR-H11-97	12 ¼	14	37 ¾	97	13.5	10,314	1,638	
PELR-H12-97	12 ¼	14	38 ½	97	13.5	10,611	1,756	
PELR-H13-97	12 ¼	15	39 ¾	97	13.5	11,072	1,877	
PELR-H14-97	12 ¼	15	41 ¼	97	13.5	11,369	2,001	
PELR-H15-97	12 ¼	16	42 ¾	97	13.5	11,830	2,130	
PELR-H16-97	12 ¼	16	44	97	13.5	12,127	2,263	

102 FT.		SOUTHERN YELLOW PINE					Approx. Treated Weight (lbs.)	Ultimate Groudl ine Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
PELR-1-102	12 ¼	7 ½	23 ¾	102	14	6,597	680	
PELR-H1-102	12 ¼	7 ½	24 ¾	102	14	6,909	758	
PELR-H2-102	12 ¼	7 ½	26 ¾	102	14	7,221	840	
PELR-H3-102	12 ¼	8	27 ½	102	14	7,619	926	
PELR-H4-102	12 ¼	9	28 ¾	102	14	8,103	1,016	
PELR-H5-102	12 ¼	10	30 ¼	102	14	8,588	1,110	
PELR-H6-102	12 ¼	11	31 ¾	102	14	9,072	1,208	
PELR-H7-102	12 ¼	12	33	102	14	9,556	1,310	
PELR-H8-102	12 ¼	12	34 ¾	102	14	9,868	1,415	
PELR-H9-102	12 ¼	13	35 ¾	102	14	10,352	1,525	
PELR-H10-102	12 ¼	13	37 ¾	102	14	10,664	1,638	
PELR-H11-102	12 ¼	14	38 ½	102	14	11,149	1,756	
PELR-H12-102	12 ¼	14	39 ¾	102	14	11,461	1,877	
PELR-H13-102	12 ¼	15	41 ¼	102	14	11,945	2,001	
PELR-H14-102	12 ¼	15	42 ¾	102	14	12,257	2,130	
PELR-H15-102	12 ¼	16	44	102	14	12,741	2,263	
PELR-H16-102	12 ¼	16	45 ¾	102	14	13,053	2,399	

107 FT.		SOUTHERN YELLOW PINE					Approx. Treated Weight (lbs.)	Ultimate Groudl ine Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
PELR-1-107	12 ¼	7 ½	24 ¾	107	14.5	7,241	758	
PELR-H1-107	12 ¼	7 ½	26 ¾	107	14.5	7,568	840	
PELR-H2-107	12 ¼	7 ½	27 ½	107	14.5	7,895	926	
PELR-H3-107	12 ¼	8	28 ¾	107	14.5	8,312	1,016	
PELR-H4-107	12 ¼	9	30 ¼	107	14.5	8,820	1,110	
PELR-H5-107	12 ¼	10	31 ¾	107	14.5	9,328	1,208	
PELR-H6-107	12 ¼	11	33	107	14.5	9,836	1,310	
PELR-H7-107	12 ¼	12	34 ¾	107	14.5	10,344	1,415	
PELR-H8-107	12 ¼	12	35 ¾	107	14.5	10,671	1,525	
PELR-H9-107	12 ¼	13	37 ¾	107	14.5	11,178	1,638	
PELR-H10-107	12 ¼	13	38 ½	107	14.5	11,505	1,756	
PELR-H11-107	12 ¼	14	39 ¾	107	14.5	12,013	1,877	
PELR-H12-107	12 ¼	14	41 ¼	107	14.5	12,340	2,001	
PELR-H13-107	12 ¼	15	42 ¾	107	14.5	12,848	2,130	
PELR-H14-107	12 ¼	15	44	107	14.5	13,175	2,263	
PELR-H15-107	12 ¼	16	45 ¾	107	14.5	13,683	2,399	
PELR-H16-107	12 ¼	16	46 ¾	107	14.5	14,009	2,539	



# RAKED POLE STANDARD SIZES

COASTAL DOUGLAS FIR

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**32FT - 107FT**

LARGER SIZES AVAILABLE AS REQUIRED

*View the E-LAM® installation  
video online at: [www.lwsinc.com](http://www.lwsinc.com)*



# E-LAM® COASTAL DOUGLAS FIR RAKED POLES

32 FT.	COASTAL DOUGLAS FIR					Approx. Treated Weight (lbs.)	Ultimate Grounline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)		
ELR-4-32	6 ¾	6 ½	10 ½	32	7.5	549	65
ELR-3-32	6 ¾	6 ½	12	32	7.5	606	85
ELR-2-32	6 ¾	6 ½	13 ½	32	7.5	662	108
ELR-1-32	6 ¾	7 ½	15	32	7.5	742	133
ELR-H1-32	6 ¾	7 ½	16 ½	32	7.5	799	161
ELR-H2-32	6 ¾	7 ½	18	32	7.5	856	191
ELR-H3-32	8 ¾	8	18	32	7.5	1,124	248
ELR-H4-32	8 ¾	9	19 ½	32	7.5	1,228	291
ELR-H5-32	8 ¾	10	21	32	7.5	1,332	338
ELR-H6-32	8 ¾	11	22 ½	32	7.5	1,436	388
ELR-H7-32	8 ¾	12	24	32	7.5	1,540	441
ELR-H8-32	10 ¼	12	22 ½	32	7.5	1,717	454
ELR-H9-32	10 ¼	13	24	32	7.5	1,839	517
ELR-H10-32	10 ¼	13	25 ½	32	7.5	1,925	583
ELR-H11-32	10 ¼	14	27	32	7.5	2,047	654
ELR-H12-32	10 ¼	14	28 ½	32	7.5	2,133	728
ELR-H13-32	10 ¼	15	30	32	7.5	2,254	807
ELR-H14-32	10 ¼	15	31 ½	32	7.5	2,340	890
ELR-H15-32	12 ¼	16	30	32	7.5	2,737	965
ELR-H16-32	12 ¼	16	31 ½	32	7.5	2,840	1,064

37 FT.	COASTAL DOUGLAS FIR					Approx. Treated Weight (lbs.)	Ultimate Grounline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)		
ELR-4-37	6 ¾	6 ½	10 ½	37	8	632	65
ELR-3-37	6 ¾	6 ½	12	37	8	697	85
ELR-2-37	6 ¾	6 ½	13 ½	37	8	761	108
ELR-1-37	6 ¾	7 ½	15	37	8	853	133
ELR-H1-37	6 ¾	7 ½	16 ½	37	8	918	161
ELR-H2-37	6 ¾	7 ½	18	37	8	983	191
ELR-H3-37	6 ¾	8	18	37	8	1,292	248
ELR-H4-37	6 ¾	9	19 ½	37	8	1,411	291
ELR-H5-37	6 ¾	10	21	37	8	1,531	338
ELR-H6-37	6 ¾	11	22 ½	37	8	1,651	388
ELR-H7-37	6 ¾	12	24	37	8	1,770	441
ELR-H8-37	6 ¾	12	22 ½	37	8	1,976	454
ELR-H9-37	8 ½	13	24	37	8	2,116	517
ELR-H10-37	8 ½	13	25 ½	37	8	2,214	583
ELR-H11-37	8 ½	14	27	37	8	2,354	654
ELR-H12-37	8 ½	14	28 ½	37	8	2,452	728
ELR-H13-37	8 ½	15	30	37	8	2,592	807
ELR-H14-37	8 ½	15	31 ½	37	8	2,690	890
ELR-H15-37	8 ½	16	30	37	8	3,148	965
ELR-H16-37	8 ½	16	31 ½	37	8	3,265	1,064

42 FT.	COASTAL DOUGLAS FIR					Approx. Treated Weight (lbs.)	Ultimate Grounline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)		
ELR-4-42	6 ¾	6 ½	12	42	8	785	85
ELR-3-42	6 ¾	6 ½	13 ½	42	8	857	108
ELR-2-42	6 ¾	6 ½	15	42	8	929	133
ELR-1-42	6 ¾	7 ½	16 ½	42	8	1,033	161
ELR-H1-42	6 ¾	7 ½	18	42	8	1,104	191
ELR-H2-42	8 ¾	7 ½	18	42	8	1,432	248
ELR-H3-42	8 ¾	8	19 ½	42	8	1,546	291
ELR-H4-42	8 ¾	9	21	42	8	1,681	338
ELR-H5-42	8 ¾	10	22 ½	42	8	1,816	388
ELR-H6-42	8 ¾	11	24	42	8	1,951	441
ELR-H7-42	10 ¼	12	22 ½	42	8	2,226	454
ELR-H8-42	10 ¼	12	24	42	8	2,335	517
ELR-H9-42	10 ¼	13	25 ½	42	8	2,493	583
ELR-H10-42	10 ¼	13	27	42	8	2,602	654
ELR-H11-42	10 ¼	14	28 ½	42	8	2,760	728
ELR-H12-42	10 ¼	14	30	42	8	2,869	807
ELR-H13-42	10 ¼	15	31 ½	42	8	3,028	890
ELR-H14-42	12 ¼	15	30	42	8	3,488	965
ELR-H15-42	12 ¼	16	31 ½	42	8	3,677	1,064
ELR-H16-42	12 ¼	16	33	42	8	3,808	1,167

47 FT.	COASTAL DOUGLAS FIR					Approx. Treated Weight (lbs.)	Ultimate Grounline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)		
ELR-4-47	8 ¾	6 ½	12	47	8.5	1,136	110
ELR-3-47	8 ¾	6 ½	13 ½	47	8.5	1,239	140
ELR-2-47	8 ¾	7 ½	15	47	8.5	1,390	172
ELR-1-47	8 ¾	7 ½	16 ½	47	8.5	1,493	208
ELR-H1-47	8 ¾	7 ½	18	47	8.5	1,596	248
ELR-H2-47	8 ¾	7 ½	19 ½	47	8.5	1,699	291
ELR-H3-47	8 ¾	8	21	47	8.5	1,827	338
ELR-H4-47	8 ¾	9	22 ½	47	8.5	1,977	388
ELR-H5-47	8 ¾	10	24	47	8.5	2,128	441
ELR-H6-47	10 ¼	11	22 ½	47	8.5	2,428	454
ELR-H7-47	10 ¼	12	24	47	8.5	2,605	517
ELR-H8-47	12 ¼	12	25 ½	47	8.5	2,969	543
ELR-H9-47	12 ¼	13	27	47	8.5	3,180	617
ELR-H10-47	12 ¼	13	28 ½	47	8.5	3,325	697
ELR-H11-47	12 ¼	14	30	47	8.5	3,536	781
ELR-H12-47	12 ¼	14	31 ½	47	8.5	3,680	871
ELR-H13-47	12 ¼	15	30	47	8.5	3,892	965
ELR-H14-47	12 ¼	15	31 ½	47	8.5	4,036	1,064
ELR-H15-47	12 ¼	16	33	47	8.5	4,247	1,167
ELR-H16-47	12 ¼	16	34 ½	47	8.5	4,392	1,276

# E-LAM® COASTAL DOUGLAS FIR RAKED POLES

52 FT.		COASTAL DOUGLAS FIR					Approx. Treated Weight (lbs.)	Ultimate Grounline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
ELR-3-52	8 ¾	6 ½	13 ½	52	9	1,367	140	
ELR-2-52	8 ¾	7 ½	15	52	9	1,534	172	
ELR-1-52	8 ¾	7 ½	16 ½	52	9	1,647	208	
ELR-H1-52	10 ¼	7 ½	16 ½	52	9	1,930	244	
ELR-H2-52	10 ¼	7 ½	18	52	9	2,063	291	
ELR-H3-52	10 ¼	8	19 ½	52	9	2,227	341	
ELR-H4-52	10 ¼	9	21	52	9	2,422	396	
ELR-H5-52	10 ¼	10	22 ½	52	9	2,617	454	
ELR-H6-52	10 ¼	11	24	52	9	2,813	517	
ELR-H7-52	12 ¼	12	22 ½	52	9	3,277	543	
ELR-H8-52	12 ¼	12	24	52	9	3,436	617	
ELR-H9-52	12 ¼	13	25 ½	52	9	3,670	697	
ELR-H10-52	12 ¼	13	27	52	9	3,828	781	
ELR-H11-52	12 ¼	14	28 ½	52	9	4,062	871	
ELR-H12-52	12 ¼	14	30	52	9	4,221	965	
ELR-H13-52	12 ¼	15	31 ½	52	9	4,454	1,064	
ELR-H14-52	12 ¼	15	33	52	9	4,613	1,167	
ELR-H15-52	12 ¼	16	34 ½	52	9	4,846	1,276	
ELR-H16-52	12 ¼	16	36	52	9	5,005	1,389	

57 FT.		COASTAL DOUGLAS FIR					Approx. Treated Weight (lbs.)	Ultimate Grounline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
ELR-2-57	10 ¼	7 ½	15	57	9.5	1,966	202	
ELR-1-57	10 ¼	7 ½	16 ½	57	9.5	2,111	244	
ELR-H1-57	10 ¼	7 ½	18	57	9.5	2,255	291	
ELR-H2-57	10 ¼	7 ½	19 ½	57	9.5	2,400	341	
ELR-H3-57	10 ¼	8	21	57	9.5	2,580	396	
ELR-H4-57	10 ¼	9	22 ½	57	9.5	2,793	454	
ELR-H5-57	10 ¼	10	24	57	9.5	3,007	517	
ELR-H6-57	12 ¼	11	22 ½	57	9.5	3,503	543	
ELR-H7-57	12 ¼	12	24	57	9.5	3,759	617	
ELR-H8-57	12 ¼	12	25 ½	57	9.5	3,932	697	
ELR-H9-57	12 ¼	13	27	57	9.5	4,188	781	
ELR-H10-57	12 ¼	13	28 ½	57	9.5	4,361	871	
ELR-H11-57	12 ¼	14	30	57	9.5	4,616	965	
ELR-H12-57	12 ¼	14	31 ½	57	9.5	4,789	1,064	
ELR-H13-57	12 ¼	15	33	57	9.5	5,045	1,167	
ELR-H14-57	12 ¼	15	34 ½	57	9.5	5,218	1,276	
ELR-H15-57	12 ¼	16	36	57	9.5	5,474	1,389	
ELR-H16-57	12 ¼	16	37 ½	57	9.5	5,647	1,507	

62 FT.		COASTAL DOUGLAS FIR					Approx. Treated Weight (lbs.)	Ultimate Grounline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
ELR-1-62	12 ¼	7 ½	15	62	10	2,551	241	
ELR-H1-62	12 ¼	7 ½	16 ½	62	10	2,738	292	
ELR-H2-62	12 ¼	7 ½	18	62	10	2,926	347	
ELR-H3-62	12 ¼	8	19 ½	62	10	3,158	408	
ELR-H4-62	12 ¼	9	21	62	10	3,436	473	
ELR-H5-62	12 ¼	10	22 ½	62	10	3,714	543	
ELR-H6-62	12 ¼	11	24	62	10	3,991	617	
ELR-H7-62	12 ¼	12	25 ½	62	10	4,269	697	
ELR-H8-62	12 ¼	12	27	62	10	4,457	781	
ELR-H9-62	12 ¼	13	28 ½	62	10	4,734	871	
ELR-H10-62	12 ¼	13	30	62	10	4,922	965	
ELR-H11-62	12 ¼	14	31 ½	62	10	5,199	1,064	
ELR-H12-62	12 ¼	14	33	62	10	5,387	1,167	
ELR-H13-62	12 ¼	15	34 ½	62	10	5,664	1,276	
ELR-H14-62	12 ¼	15	36	62	10	5,852	1,389	
ELR-H15-62	12 ¼	16	37 ½	62	10	6,129	1,507	
ELR-H16-62	12 ¼	16	39	62	10	6,317	1,630	

67 FT.		COASTAL DOUGLAS FIR					Approx. Treated Weight (lbs.)	Ultimate Grounline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
ELR-1-67	12 ¼	7 ½	16 ½	67	10.5	2,955	292	
ELR-H1-67	12 ¼	7 ½	18	67	10.5	3,156	347	
ELR-H2-67	12 ¼	7 ½	19 ½	67	10.5	3,358	408	
ELR-H3-67	12 ¼	8	21	67	10.5	3,609	473	
ELR-H4-67	12 ¼	9	22 ½	67	10.5	3,909	543	
ELR-H5-67	12 ¼	10	24	67	10.5	4,208	617	
ELR-H6-67	12 ¼	11	25 ½	67	10.5	4,508	697	
ELR-H7-67	12 ¼	12	27	67	10.5	4,808	781	
ELR-H8-67	12 ¼	12	28 ½	67	10.5	5,010	871	
ELR-H9-67	12 ¼	13	30	67	10.5	5,310	965	
ELR-H10-67	12 ¼	13	31 ½	67	10.5	5,511	1,064	
ELR-H11-67	12 ¼	14	33	67	10.5	5,811	1,167	
ELR-H12-67	12 ¼	14	34 ½	67	10.5	6,013	1,276	
ELR-H13-67	12 ¼	15	36	67	10.5	6,313	1,389	
ELR-H14-67	12 ¼	15	37 ½	67	10.5	6,514	1,507	
ELR-H15-67	12 ¼	16	39	67	10.5	6,814	1,630	
ELR-H16-67	12 ¼	16	40 ½	67	10.5	7,016	1,758	

# E-LAM® COASTAL DOUGLAS FIR RAKED POLES

72 FT.		COASTAL DOUGLAS FIR					Approx. Treated Weight (lbs.)	Ultimate Grouddline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
ELR-1-72	12 ¼	7 ½	16 ½	72	11	3,171	292	
ELR-H1-72	12 ¼	7 ½	18	72	11	3,387	347	
ELR-H2-72	12 ¼	7 ½	19 ½	72	11	3,603	408	
ELR-H3-72	12 ¼	8	21	72	11	3,872	473	
ELR-H4-72	12 ¼	9	22 ½	72	11	4,194	543	
ELR-H5-72	12 ¼	10	24	72	11	4,516	617	
ELR-H6-72	12 ¼	11	25 ½	72	11	4,837	697	
ELR-H7-72	12 ¼	12	27	72	11	5,159	781	
ELR-H8-72	12 ¼	12	28 ½	72	11	5,375	871	
ELR-H9-72	12 ¼	13	30	72	11	5,697	965	
ELR-H10-72	12 ¼	13	31 ½	72	11	5,913	1,064	
ELR-H11-72	12 ¼	14	33	72	11	6,235	1,167	
ELR-H12-72	12 ¼	14	34 ½	72	11	6,451	1,276	
ELR-H13-72	12 ¼	15	36	72	11	6,773	1,389	
ELR-H14-72	12 ¼	15	37 ½	72	11	6,989	1,507	
ELR-H15-72	12 ¼	16	39	72	11	7,311	1,630	
ELR-H16-72	12 ¼	16	40 ½	72	11	7,527	1,758	

77 FT.		COASTAL DOUGLAS FIR					Approx. Treated Weight (lbs.)	Ultimate Grouddline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
ELR-1-77	12 ¼	7 ½	18	77	11.5	3,617	347	
ELR-H1-77	12 ¼	7 ½	19 ½	77	11.5	3,847	408	
ELR-H2-77	12 ¼	7 ½	21	77	11.5	4,078	473	
ELR-H3-77	12 ¼	8	22 ½	77	11.5	4,365	543	
ELR-H4-77	12 ¼	9	24	77	11.5	4,709	617	
ELR-H5-77	12 ¼	10	25 ½	77	11.5	5,053	697	
ELR-H6-77	12 ¼	11	27	77	11.5	5,397	781	
ELR-H7-77	12 ¼	12	28 ½	77	11.5	5,741	871	
ELR-H8-77	12 ¼	12	30	77	11.5	5,972	965	
ELR-H9-77	12 ¼	13	31 ½	77	11.5	6,316	1,064	
ELR-H10-77	12 ¼	13	33	77	11.5	6,546	1,167	
ELR-H11-77	12 ¼	14	34 ½	77	11.5	6,890	1,276	
ELR-H12-77	12 ¼	14	36	77	11.5	7,120	1,389	
ELR-H13-77	12 ¼	15	37 ½	77	11.5	7,464	1,507	
ELR-H14-77	12 ¼	15	39	77	11.5	7,695	1,630	
ELR-H15-77	12 ¼	16	40 ½	77	11.5	8,039	1,758	
ELR-H16-77	12 ¼	16	42	77	11.5	8,269	1,891	

82 FT.		COASTAL DOUGLAS FIR					Approx. Treated Weight (lbs.)	Ultimate Grouddline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
ELR-1-82	12 ¼	7 ½	19 ½	82	12	4,092	408	
ELR-H1-82	12 ¼	7 ½	21	82	12	4,337	473	
ELR-H2-82	12 ¼	7 ½	22 ½	82	12	4,582	543	
ELR-H3-82	12 ¼	8	24	82	12	4,887	617	
ELR-H4-82	12 ¼	9	25 ½	82	12	5,253	697	
ELR-H5-82	12 ¼	10	27	82	12	5,619	781	
ELR-H6-82	12 ¼	11	28 ½	82	12	5,985	871	
ELR-H7-82	12 ¼	12	30	82	12	6,352	965	
ELR-H8-82	12 ¼	12	31 ½	82	12	6,596	1,064	
ELR-H9-82	12 ¼	13	33	82	12	6,962	1,167	
ELR-H10-82	12 ¼	13	34 ½	82	12	7,207	1,276	
ELR-H11-82	12 ¼	14	36	82	12	7,573	1,389	
ELR-H12-82	12 ¼	14	37 ½	82	12	7,818	1,507	
ELR-H13-82	12 ¼	15	39	82	12	8,184	1,630	
ELR-H14-82	12 ¼	15	40 ½	82	12	8,429	1,758	
ELR-H15-82	12 ¼	16	42	82	12	8,795	1,891	
ELR-H16-82	12 ¼	16	43 ½	82	12	9,040	2,028	

87 FT.		COASTAL DOUGLAS FIR					Approx. Treated Weight (lbs.)	Ultimate Grouddline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
ELR-1-87	12 ¼	7 ½	21	87	12.5	4,596	473	
ELR-H1-87	12 ¼	7 ½	22 ½	87	12.5	4,855	543	
ELR-H2-87	12 ¼	7 ½	24	87	12.5	5,114	617	
ELR-H3-87	12 ¼	8	25 ½	87	12.5	5,437	697	
ELR-H4-87	12 ¼	9	27	87	12.5	5,826	781	
ELR-H5-87	12 ¼	10	28 ½	87	12.5	6,214	871	
ELR-H6-87	12 ¼	11	30	87	12.5	6,602	965	
ELR-H7-87	12 ¼	12	31 ½	87	12.5	6,991	1,064	
ELR-H8-87	12 ¼	12	33	87	12.5	7,250	1,167	
ELR-H9-87	12 ¼	13	34 ½	87	12.5	7,638	1,276	
ELR-H10-87	12 ¼	13	36	87	12.5	7,897	1,389	
ELR-H11-87	12 ¼	14	37 ½	87	12.5	8,285	1,507	
ELR-H12-87	12 ¼	14	39	87	12.5	8,544	1,630	
ELR-H13-87	12 ¼	15	40 ½	87	12.5	8,933	1,758	
ELR-H14-87	12 ¼	15	42	87	12.5	9,192	1,891	
ELR-H15-87	12 ¼	16	43 ½	87	12.5	9,580	2,028	
ELR-H16-87	12 ¼	16	45	87	12.5	9,839	2,171	

# E-LAM® COASTAL DOUGLAS FIR RAKED POLES

92 FT.		COASTAL DOUGLAS FIR					Approx. Treated Weight (lbs.)	Ultimate Grouddline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
ELR-1-92	12 ¼	7 ½	22 ½	92	13	5,128	543	
ELR-H1-92	12 ¼	7 ½	24	92	13	5,401	617	
ELR-H2-92	12 ¼	7 ½	25 ½	92	13	5,675	697	
ELR-H3-92	12 ¼	8	27	92	13	6,017	781	
ELR-H4-92	12 ¼	9	28 ½	92	13	6,427	871	
ELR-H5-92	12 ¼	10	30	92	13	6,838	965	
ELR-H6-92	12 ¼	11	31 ½	92	13	7,248	1,064	
ELR-H7-92	12 ¼	12	33	92	13	7,658	1,167	
ELR-H8-92	12 ¼	12	34 ½	92	13	7,932	1,276	
ELR-H9-92	12 ¼	13	36	92	13	8,342	1,389	
ELR-H10-92	12 ¼	13	37 ½	92	13	8,615	1,507	
ELR-H11-92	12 ¼	14	39	92	13	9,026	1,630	
ELR-H12-92	12 ¼	14	40 ½	92	13	9,299	1,758	
ELR-H13-92	12 ¼	15	42	92	13	9,710	1,891	
ELR-H14-92	12 ¼	15	43 ½	92	13	9,983	2,028	
ELR-H15-92	12 ¼	16	45	92	13	10,393	2,171	
ELR-H16-92	12 ¼	16	46 ½	92	13	10,667	2,318	

97 FT.		COASTAL DOUGLAS FIR					Approx. Treated Weight (lbs.)	Ultimate Grouddline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
ELR-1-97	12 ¼	7 ½	24	97	13.5	5,689	617	
ELR-H1-97	12 ¼	7 ½	25 ½	97	13.5	5,977	697	
ELR-H2-97	12 ¼	7 ½	27	97	13.5	6,264	781	
ELR-H3-97	12 ¼	8	28 ½	97	13.5	6,625	871	
ELR-H4-97	12 ¼	9	30	97	13.5	7,057	965	
ELR-H5-97	12 ¼	10	31 ½	97	13.5	7,490	1,064	
ELR-H6-97	12 ¼	11	33	97	13.5	7,922	1,167	
ELR-H7-97	12 ¼	12	34 ½	97	13.5	8,355	1,276	
ELR-H8-97	12 ¼	12	36	97	13.5	8,642	1,389	
ELR-H9-97	12 ¼	13	37 ½	97	13.5	9,075	1,507	
ELR-H10-97	12 ¼	13	39	97	13.5	9,363	1,630	
ELR-H11-97	12 ¼	14	40 ½	97	13.5	9,795	1,758	
ELR-H12-97	12 ¼	14	42	97	13.5	10,083	1,891	
ELR-H13-97	12 ¼	15	43 ½	97	13.5	10,515	2,028	
ELR-H14-97	12 ¼	15	45	97	13.5	10,803	2,171	
ELR-H15-97	12 ¼	16	46 ½	97	13.5	11,236	2,318	
ELR-H16-97	12 ¼	16	48	97	13.5	11,523	2,470	

102 FT.		COASTAL DOUGLAS FIR					Approx. Treated Weight (lbs.)	Ultimate Grouddline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
ELR-1-102	12 ¼	7 ½	25 ½	102	14	6,279	697	
ELR-H1-102	12 ¼	7 ½	27	102	14	6,581	781	
ELR-H2-102	12 ¼	7 ½	28 ½	102	14	6,883	871	
ELR-H3-102	12 ¼	8	30	102	14	7,261	965	
ELR-H4-102	12 ¼	9	31 ½	102	14	7,716	1,064	
ELR-H5-102	12 ¼	10	33	102	14	8,170	1,167	
ELR-H6-102	12 ¼	11	34 ½	102	14	8,625	1,276	
ELR-H7-102	12 ¼	12	36	102	14	9,080	1,389	
ELR-H8-102	12 ¼	12	37 ½	102	14	9,382	1,507	
ELR-H9-102	12 ¼	13	39	102	14	9,836	1,630	
ELR-H10-102	12 ¼	13	40 ½	102	14	10,138	1,758	
ELR-H11-102	12 ¼	14	42	102	14	10,593	1,891	
ELR-H12-102	12 ¼	14	43 ½	102	14	10,895	2,028	
ELR-H13-102	12 ¼	15	45	102	14	11,350	2,171	
ELR-H14-102	12 ¼	15	46 ½	102	14	11,652	2,318	
ELR-H15-102	12 ¼	16	48	102	14	12,106	2,470	
ELR-H16-102	12 ¼	16	49 ½	102	14	12,408	2,626	

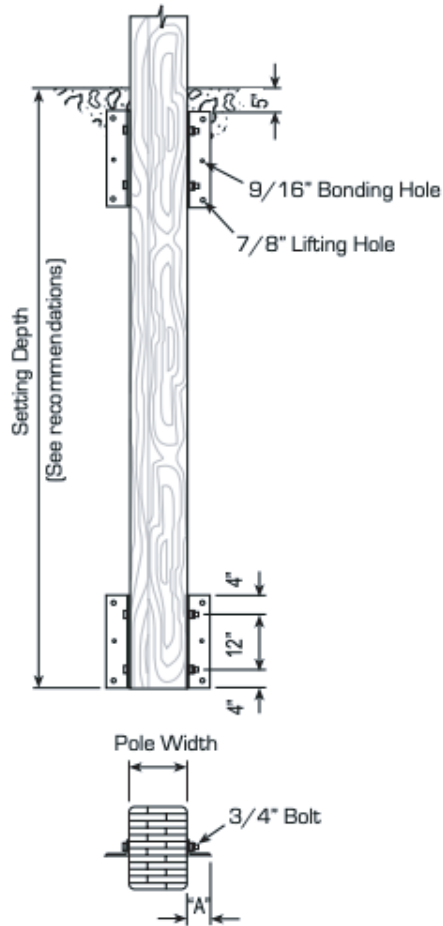
107 FT.		COASTAL DOUGLAS FIR					Approx. Treated Weight (lbs.)	Ultimate Grouddline Moment (ft.-kips)
Pole Class	W (in.)	T (in.)	B (in.)	L (ft.)	C (ft.)			
ELR-1-107	12 ¼	7 ½	27	107	14.5	5,689	781	
ELR-H1-107	12 ¼	7 ½	28 ½	107	14.5	5,977	871	
ELR-H2-107	12 ¼	7 ½	30	107	14.5	6,264	965	
ELR-H3-107	12 ¼	8	31 ½	107	14.5	6,625	1,064	
ELR-H4-107	12 ¼	9	33	107	14.5	7,057	1,167	
ELR-H5-107	12 ¼	10	34 ½	107	14.5	7,490	1,276	
ELR-H6-107	12 ¼	11	36	107	14.5	7,922	1,389	
ELR-H7-107	12 ¼	12	37 ½	107	14.5	8,355	1,507	
ELR-H8-107	12 ¼	12	39	107	14.5	8,642	1,630	
ELR-H9-107	12 ¼	13	40 ½	107	14.5	9,075	1,758	
ELR-H10-107	12 ¼	13	42	107	14.5	9,363	1,891	
ELR-H11-107	12 ¼	14	43 ½	107	14.5	9,795	2,028	
ELR-H12-107	12 ¼	14	45	107	14.5	10,083	2,171	
ELR-H13-107	12 ¼	15	46 ½	107	14.5	10,515	2,318	
ELR-H14-107	12 ¼	15	48	107	14.5	10,803	2,470	
ELR-H15-107	12 ¼	16	49 ½	107	14.5	11,236	2,626	
ELR-H16-107	12 ¼	16	51	107	14.5	11,523	2,788	

# FOUNDATION REINFORCEMENT SYSTEMS

## DISTRIBUTION - "ED"

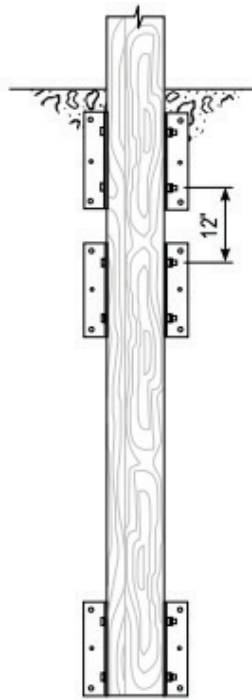
### SINGLE SYSTEM

Ordering Example: 1-EDA-5



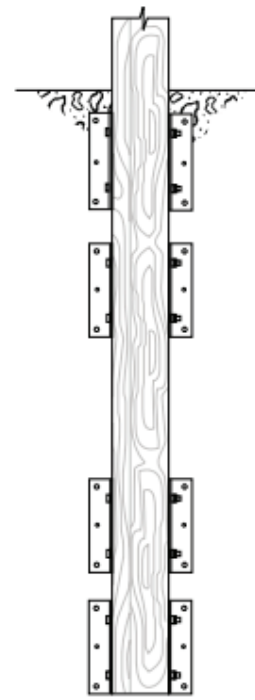
### 1-1/2 SYSTEMS

Ordering Example: 1 1/2-EDA-5



### DOUBLE SYSTEM

Ordering Example: 2-EDA-5



## BACKFILL

Reference page 8 for backfill recommendations. At a minimum, backfill should consist of compacted aggregate tamped in 6" lifts.

**NOTE:** For slumping soil or ground water conditions the customer may consider installing a concrete or steel culvert to contain the select backfill.

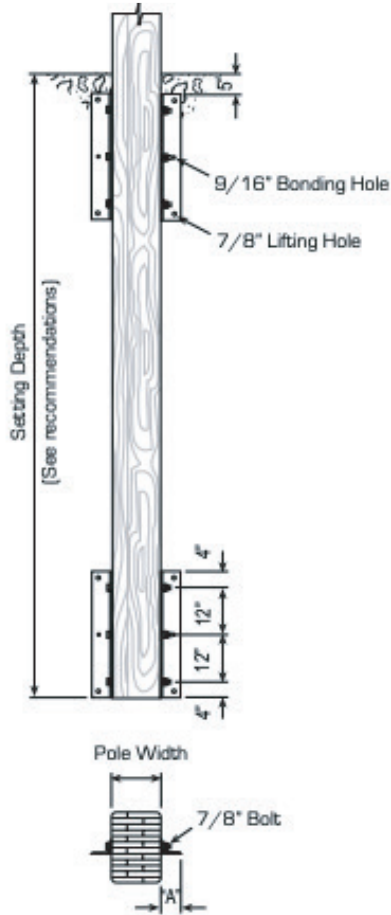
Assembly Number	"A"	Angle Number	Angle Size	Bolt Length	Weight Lbs.
<b>6 3/4" Pole Width</b>					
EDA-5	5"	ELFRDB	5" x 3" x 1/4"	10"	52
EDA-8	8"	ELFRDE	8" x 3" x 3/8"	10"	100
<b>8 1/2" or 8 3/4" Pole Width</b>					
EDB-5	5"	ELFRDB	5" x 3" x 1/4"	12"	53
EDB-8	8"	ELFRDE	8" x 3" x 3/8"	12"	101
<b>10 1/4" Pole Width</b>					
EDC-5	5"	ELFRDB	5" x 3" x 1/4"	14"	54
EDC-8	8"	ELFRDE	8" x 3" x 3/8"	14"	102
<b>12 1/4" Pole Width</b>					
EDD-5	5"	ELFRDB	5" x 3" x 1/4"	15"	55
EDD-8	8"	ELFRDE	8" x 3" x 3/8"	15"	103

Each Single System Assembly Includes:  
Four (4) Angles, 20" Long; Four (4) Bolts & Nuts (Field Assembly Required)

# TRANSMISSION - "ET"

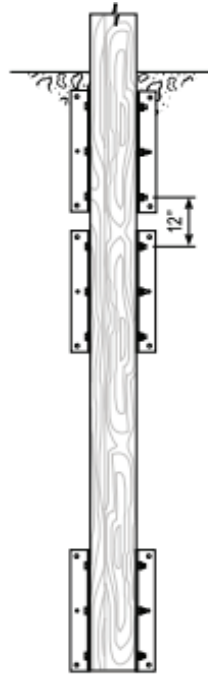
## SINGLE SYSTEM

Ordering Example: 1-ETA-5



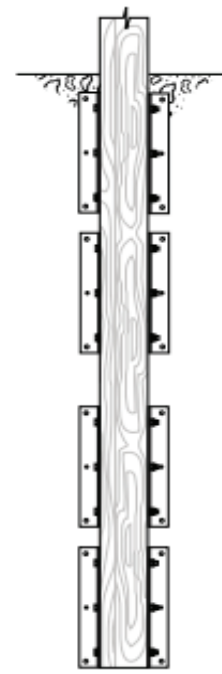
## 1-1/2 SYSTEMS

Ordering Example: 1 1/2-ETA-5



## DOUBLE SYSTEM

Ordering Example: 2-ETA-5



## BACKFILL

Reference page 8 for backfill recommendations. At a minimum, backfill should consist of compacted aggregate tamped in 6" lifts.

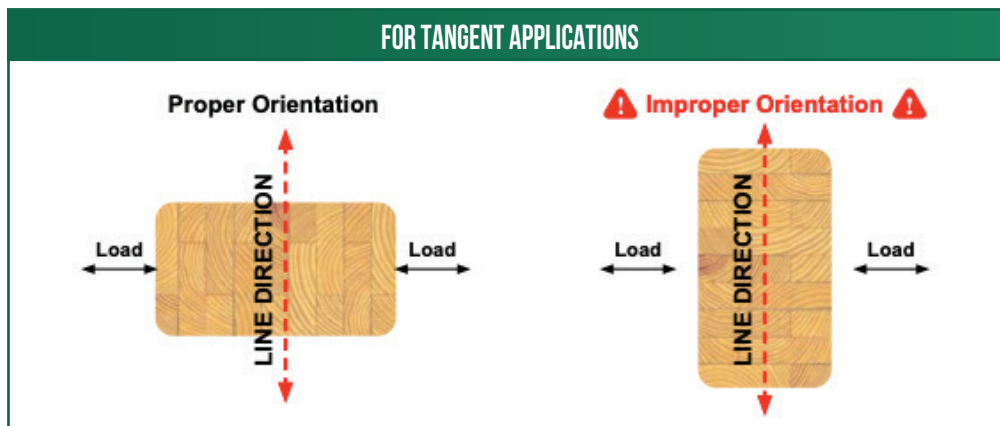
**NOTE:** For slumping soil or ground water conditions the customer may consider installing a concrete or steel culvert to contain the select backfill.

Assembly Number	"A"	Angle Number	Angle Size	Bolt Length	Weight Lbs.
<b>10 1/4" Pole Width</b>					
ETA-5	5"	ELFRTB	5" x 3' x 1/4"	14"	90
ETA-8	8"	ELFRTE	8" x 3' x 3/8"	14"	170
ETA-12	12"	ELFRTF	12" x 3' x 3/8"	14"	222
<b>12 1/4" Pole Width</b>					
ETB-5	5"	ELFRTB	5" x 3' x 1/4"	16"	92
ETB-8	8"	ELFRTE	8" x 3' x 3/8"	16"	172
ETB-12	12"	ELFRTF	12" x 3' x 3/8"	16"	224
<b>14 1/4" Pole Width</b>					
ETC-5	5"	ELFRTB	5" x 3' x 1/4"	18"	94
ETC-8	8"	ELFRTE	8" x 3' x 3/8"	18"	174
ETC-12	12"	ELFRTF	12" x 3' x 3/8"	18"	226
<b>16 1/4" Pole Width</b>					
ETD-5	5"	ELFRTB	5" x 3' x 1/4"	20"	96
ETD-8	8"	ELFRTE	8" x 3' x 3/8"	20"	176
ETD-12	12"	ELFRTF	12" x 3' x 3/8"	20"	228

Each Single System Assembly Includes:  
Four (4) Angles, 32" Long; Six (6) Bolts & Nuts (Field Assembly Required)

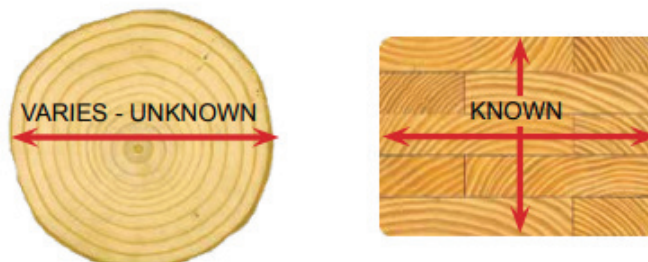
## WHEN CAN E-LAM<sup>®</sup> POLES BE SUBSTITUTED FOR ROUND WOOD?

E-LAM<sup>®</sup> poles can be substituted for round wood class equivalent poles when used properly. The primary difference between a laminated wood pole and a round wood pole is the fact that a round wood pole has the same strength rating in all (360°) directions, while a rectangular laminated pole is strongest in the transverse direction. As long as laminated poles are oriented in a straight line, tangent direction, they can be substituted for the same round wood class equivalent size pole, provided they meet the extreme wind requirements of NESC Rule 261.A. LWS makes no claims that the rectangular poles can be used in every application that a symmetrically round pole is used. We recommend LWS engineers review the applications to confirm the fitness of use for any non-tangent application.



## TAKE ADVANTAGE OF THE ATTRIBUTES OF E-LAM<sup>®</sup> POLES COMBINED WITH THE ENGINEERING EXPERTISE OF LWS

Unlike round wood poles, E-LAM<sup>®</sup> poles are consistent in strength and dimension, insuring that all bolts and attachment hardware will fit. There's no need to buy extra hardware because of varying pole diameters. LWS supplies certain special hardware items and adapter plates that can accommodate virtually every hardware attachment application. However, there are some incompatibilities with certain standard round wood pole line hardware items such as pole bands and guying attachments.





# TANGENT POLE STANDARD SIZES

SOUTHERN YELLOW PINE

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**30FT - 135FT**

LARGER SIZES AVAILABLE AS REQUIRED

*View the E-LAM® installation  
video online at: [www.lwsinc.com](http://www.lwsinc.com)*



# E-LAM® SOUTHERN YELLOW PINE TANGENT POLES

Pole Length	Pole Class	Long. Width	Top Depth	Butt Depth	Ultimate Longitudinal Groundline Moment (Ft.-Kips)	Ultimate Transverse Groundline Moment (Ft.-Kips)	Approximate Treated Weight (Lbs.)
<b>30 FT.</b>	PEL-5-30	6 ¾" x	5 ½"	9 ⅝"	44.9	56.0	490
	PEL-4-30	6 ¾" x	6"	10 ½"	48.9	66.6	535
	PEL-3-30	6 ¾" x	6 ½"	11 ⅜"	53.0	78.2	580
	PEL-2-30	6 ¾" x	7"	12 ¼"	57.1	90.7	625
	PEL-1-30	6 ¾" x	7 ½"	13 ⅙"	61.2	104.2	670
<b>35 FT.</b>	PEL-5-35	6 ¾" x	5 ½"	9 ⅝"	45.1	56.6	570
	PEL-4-35	6 ¾" x	6"	11 ⅞"	55.0	84.1	675
	PEL-3-35	6 ¾" x	6 ½"	12 ¾"	59.1	97.1	725
	PEL-2-35	6 ¾" x	7"	13 ⅝"	63.2	111.1	775
	PEL-1-35	6 ¾" x	7 ½"	14 ½"	67.3	126.0	830
<b>40 FT.</b>	PEL-5-40	6 ¾" x	5 ½"	11"	51.5	73.7	710
	PEL-4-40	6 ¾" x	6"	11 ⅞"	55.6	86.1	770
	PEL-3-40	6 ¾" x	6 ½"	14 ⅙"	65.7	120.0	890
	PEL-2-40	6 ¾" x	7"	15"	69.8	135.6	950
	PEL-1-40	6 ¾" x	7 ½"	15 ⅞"	74.0	152.2	1,010
<b>45 FT.</b>	PEL-5-45	8 ½" x	5"	11 ½"	84.7	100.0	1,010
	PEL-4-45	8 ½" x	5"	11 ½"	84.7	100.0	1,010
	PEL-3-45	8 ½" x	5 ½"	13 ¾"	100.8	141.5	1,170
	PEL-2-45	8 ½" x	6 ¼"	14 ⅜"	105.9	156.3	1,260
	PEL-1-45	8 ½" x	7"	15"	111.1	171.9	1,340
	PEL-H1-45	8 ½" x	7 ½"	17 ¼"	127.1	225.1	1,510
	PEL-H2-45	8 ½" x	8"	18 ⅙"	133.7	248.1	1,595
<b>50 FT.</b>	PEL-5-50	8 ½" x	5"	11 ½"	85.0	100.6	1,120
	PEL-4-50	8 ½" x	5"	12 ⅞"	94.5	124.3	1,210
	PEL-3-50	8 ½" x	5 ½"	13 ¾"	101.1	142.3	1,305
	PEL-2-50	8 ½" x	6 ¼"	15 ¾"	115.7	186.5	1,490
	PEL-1-50	8 ½" x	7"	16 ⅜"	120.9	203.5	1,585
	PEL-H1-50	8 ½" x	7 ½"	18 ⅝"	137.0	259.6	1,770
	PEL-H2-50	8 ½" x	8"	19 ½"	143.6	284.0	1,870
<b>55 FT.</b>	PEL-5-55	8 ½" x	5"	12 ⅞"	94.7	124.9	1,335
	PEL-4-55	8 ½" x	5"	14 ¼"	104.2	151.3	1,440
	PEL-3-55	8 ½" x	5 ½"	15 ⅙"	110.8	171.1	1,540
	PEL-2-55	8 ½" x	6 ¼"	15 ¾"	116.0	187.4	1,645
	PEL-1-55	8 ½" x	7"	17 ¾"	130.7	237.5	1,850
	PEL-H1-55	8 ½" x	7 ½"	18 ⅝"	137.3	260.8	1,950
	PEL-H2-55	8 ½" x	8"	20 ⅞"	153.4	322.1	2,160
<b>60 FT.</b>	PEL-3-60	8 ½" x	6"	16"	117.7	193.0	1,795
	PEL-2-60	8 ½" x	6 ¼"	17 ⅙"	125.8	220.4	1,905
	PEL-1-60	10 ¼" x	6 ¼"	17 ⅙"	182.9	265.8	2,300
	PEL-H1-60	10 ¼" x	7"	17 ¾"	190.4	287.4	2,430
	PEL-H2-60	10 ¼" x	7 ⅝"	19 ⅞"	212.9	355.3	2,700
	PEL-H3-60	10 ¼" x	8 ½"	21 ¾"	233.2	422.5	2,970
	PEL-H4-60	10 ¼" x	9 ¼"	22 ⅜"	240.7	448.7	3,110
	PEL-H5-60	10 ¼" x	10"	24 ⅜"	262.1	527.5	3,380
	PEL-H6-60	10 ¼" x	11"	26 ⅙"	281.4	603.5	3,650

# E-LAM® SOUTHERN YELLOW PINE TANGENT POLES

Pole Length	Pole Class	Long. Width	Top Depth	Butt Depth	Ultimate Longitudinal Groundline Moment (Ft.-Kips)	Ultimate Transverse Groundline Moment (Ft.-Kips)	Approximate Treated Weight (Lbs.)
<b>65 FT.</b>	PEL-3-65	8 ½" x	6"	16"	117.9	193.6	1,940
	PEL-2-65	10 ¼" x	6"	16"	171.5	233.5	2,340
	PEL-1-65	10 ¼" x	6 ¼"	17 ⅞"	183.3	266.7	2,490
	PEL-H1-65	10 ¼" x	7"	19 ⅞"	204.7	329.8	2,780
	PEL-H2-65	10 ¼" x	7 ⅝"	19 ⅞"	213.3	356.5	2,925
	PEL-H3-65	10 ¼" x	8 ½"	21 ¾"	233.6	423.9	3,220
	PEL-H4-65	10 ¼" x	9 ¼"	23 ¾"	255.1	500.8	3,510
	PEL-H5-65	10 ¼" x	10"	25 ¾"	276.5	583.8	3,800
<b>70 FT.</b>	PEL-H6-65	10 ¼" x	11"	27 ½"	295.8	663.6	4,100
	PEL-3-70	8 ½" x	6"	16"	118.1	194.2	2,090
	PEL-2-70	10 ¼" x	6"	16"	171.7	234.2	2,520
	PEL-1-70	10 ¼" x	6 ¼"	18 ½"	197.5	308.1	2,835
	PEL-H1-70	10 ¼" x	7"	19 ⅞"	205.0	330.7	3,000
	PEL-H2-70	10 ¼" x	7 ⅝"	21 ¼"	227.6	403.2	3,310
	PEL-H3-70	10 ¼" x	8 ½"	23 ⅞"	248.0	474.6	3,625
	PEL-H4-70	10 ¼" x	9 ¼"	25 ⅞"	269.4	555.7	3,940
<b>75 FT.</b>	PEL-H5-70	10 ¼" x	10"	27 ⅞"	290.9	642.9	4,255
	PEL-H6-70	10 ¼" x	11"	28 ⅞"	310.2	726.3	4,570
	PEL-3-75	10 ¼" x	6"	16"	172.0	234.8	2,700
	PEL-2-75	10 ¼" x	6"	17 ⅜"	186.0	274.7	2,870
	PEL-1-75	10 ¼" x	6 ¼"	18 ½"	197.8	309.0	3,040
	PEL-H1-75	10 ¼" x	7"	20 ½"	219.3	375.9	3,380
	PEL-H2-75	10 ¼" x	7 ⅝"	22 ⅝"	241.9	452.8	3,710
	PEL-H3-75	10 ¼" x	8 ½"	24 ½"	262.3	528.1	4,055
<b>80 FT.</b>	PEL-H4-75	10 ¼" x	9 ¼"	26 ½"	283.8	613.4	4,390
	PEL-H5-75	10 ¼" x	10"	27 ⅞"	291.3	644.5	4,555
	PEL-H6-75	10 ¼" x	11"	28 ⅞"	310.6	728.1	4,895
	PEL-3-80	10 ¼" x	6"	16"	172.1	235.3	2,880
	PEL-2-80	10 ¼" x	6"	17 ⅜"	186.2	275.3	3,060
	PEL-1-80	10 ¼" x	6 ¼"	19 ⅞"	212.1	352.7	3,420
	PEL-H1-80	10 ¼" x	7"	21 ⅞"	233.6	423.8	3,780
	PEL-H2-80	10 ¼" x	7 ⅝"	22 ⅝"	242.2	453.8	3,960
<b>85 FT.</b>	PEL-H3-80	10 ¼" x	8 ½"	24 ½"	262.6	529.3	4,330
	PEL-H4-80	10 ¼" x	9 ¼"	26 ½"	284.1	614.8	4,690
	PEL-H5-80	10 ¼" x	10"	28 ½"	305.7	706.3	5,050
	PEL-H6-80	12 ¼" x	10"	28 ½"	436.6	844.1	6,020
	PEL-3-85	10 ¼" x	6"	17 ⅜"	186.4	275.9	3,250
	PEL-2-85	10 ¼" x	6"	18 ¾"	200.4	316.9	3,450
	PEL-1-85	10 ¼" x	6 ¼"	19 ⅞"	212.3	353.5	3,640
	PEL-H1-85	10 ¼" x	7"	21 ⅞"	233.9	424.7	4,020
<b>85 FT.</b>	PEL-H2-85	10 ¼" x	7 ⅝"	24"	256.5	506.2	4,400
	PEL-H3-85	10 ¼" x	8 ½"	25 ⅞"	277.0	585.6	4,780
	PEL-H4-85	10 ¼" x	9 ¼"	27 ⅞"	298.5	675.2	5,160
	PEL-H5-85	12 ¼" x	9 ⅞"	26 ⅝"	407.8	741.6	5,950
	PEL-H6-85	12 ¼" x	10"	28 ½"	437.0	845.7	6,400

# E-LAM® SOUTHERN YELLOW PINE TANGENT POLES

Pole Length	Pole Class	Long. Width	Top Depth	Butt Depth	Ultimate Longitudinal Groundline Moment (Ft.-Kips)	Ultimate Transverse Groundline Moment (Ft.-Kips)	Approximate Treated Weight (Lbs.)
<b>90 FT.</b>	PEL-3-90	10 ¼" x	6"	17 ¾"	186.6	276.4	3,450
	PEL-2-90	12 ¼" x	6"	17 ¾"	266.5	330.3	4,120
	PEL-1-90	12 ¼" x	6"	20 ⅛"	306.7	431.6	4,600
	PEL-H1-90	12 ¼" x	6 ½"	21"	320.6	469.3	4,840
	PEL-H2-90	12 ¼" x	7"	23 ¼"	354.5	568.2	5,320
	PEL-H3-90	12 ¼" x	7 ¾"	23 ⅝"	365.2	601.2	5,570
	PEL-H4-90	12 ¼" x	8 ½"	25 ⅞"	396.0	701.1	6,050
	PEL-H5-90	12 ¼" x	9 ⅞"	28"	423.4	814.1	6,540
<b>95 FT.</b>	PEL-2-95	12 ¼" x	6"	18 ¾"	288.0	382.8	4,600
	PEL-1-95	12 ¼" x	6"	20 ⅞"	308.2	435.7	4,860
	PEL-H1-95	12 ¼" x	6 ½"	22 ⅜"	342.4	531.9	5,360
	PEL-H2-95	12 ¼" x	7"	23 ¼"	356.2	573.5	5,620
	PEL-H3-95	12 ¼" x	7 ¾"	25 ¼"	387.2	671.8	6,130
	PEL-H4-95	12 ¼" x	8 ½"	27 ¼"	418.1	777.5	6,640
	PEL-H5-95	12 ¼" x	9 ⅞"	29 ⅜"	450.6	896.4	7,150
	PEL-H6-95	12 ¼" x	10"	31 ¼"	480.0	1,010.5	7,670
<b>100 FT.</b>	PEL-2-100	12 ¼" x	6"	18 ¾"	289.2	386.0	4,840
	PEL-1-100	12 ¼" x	6"	20 ⅞"	309.6	439.3	5,110
	PEL-H1-100	12 ¼" x	6 ½"	22 ⅜"	343.9	536.4	5,650
	PEL-H2-100	12 ¼" x	7"	24 ⅝"	378.2	642.6	6,180
	PEL-H3-100	12 ¼" x	7 ¾"	26 ⅝"	409.3	746.6	6,720
	PEL-H4-100	12 ¼" x	8 ½"	27 ¼"	419.9	783.9	7,000
	PEL-H5-100	12 ¼" x	9 ⅞"	29 ⅜"	452.6	903.8	7,530
	PEL-H6-100	12 ¼" x	10"	31 ¼"	482.0	1,018.8	8,100
<b>105 FT.</b>	PEL-2-105	12 ¼" x	6"	20 ⅞"	308.6	436.6	5,370
	PEL-1-105	12 ¼" x	6"	21 ½"	328.9	492.8	5,650
	PEL-H1-105	12 ¼" x	6 ½"	22 ⅜"	342.8	533.0	5,930
	PEL-H2-105	12 ¼" x	7"	24 ⅝"	377.0	638.6	6,500
	PEL-H3-105	12 ¼" x	7 ¾"	26 ⅝"	407.9	741.9	7,060
	PEL-H4-105	12 ¼" x	8 ½"	28 ⅝"	438.9	852.5	7,630
	PEL-H5-105	12 ¼" x	9 ⅞"	30 ¾"	471.5	976.7	8,190
	PEL-H6-105	12 ¼" x	10"	32 ⅝"	500.8	1,095.5	8,750
<b>110 FT.</b>	PEL-2-110	12 ¼" x	6"	20 ⅞"	309.8	439.9	5,630
	PEL-1-110	12 ¼" x	6"	21 ½"	330.2	496.6	5,920
	PEL-H1-110	12 ¼" x	6 ½"	23 ¾"	364.6	599.3	6,510
	PEL-H2-110	12 ¼" x	7"	26"	398.9	711.0	7,100
	PEL-H3-110	12 ¼" x	7 ¾"	28"	430.0	820.0	7,690
	PEL-H4-110	12 ¼" x	8 ½"	30"	461.1	936.2	8,280
	PEL-H5-110	12 ¼" x	9 ⅞"	30 ¾"	473.3	984.1	8,580
	PEL-H6-110	12 ¼" x	10"	34"	532.2	1,190.4	9,470

# E-LAM® SOUTHERN YELLOW PINE TANGENT POLES

Pole Length	Pole Class	Long. Width	Top Depth	Butt Depth	Ultimate Longitudinal Groundline Moment (Ft.-Kips)	Ultimate Transverse Groundline Moment (Ft.-Kips)	Approximate Treated Weight (Lbs.)
115 FT.	PEL-2-115	12 ¼" x 6"	-	21 ½"	331.5	500.1	6,200
	PEL-1-115	12 ¼" x 6"	-	22 ⅞"	352.0	560.6	6,500
	PEL-H1-115	12 ¼" x 6 ½"	-	23 ¾"	365.9	603.6	6,800
	PEL-H2-115	12 ¼" x 7"	-	26"	400.4	716.1	7,450
	PEL-H3-115	12 ¼" x 7 ¾"	-	28"	431.6	825.8	8,050
	PEL-H4-115	12 ¼" x 8 ½"	-	30"	462.8	942.8	8,660
	PEL-H5-115	12 ¼" x 9 ⅞"	-	32 ⅞"	495.6	1,073.8	9,280
120 FT.	PEL-2-120	12 ¼" x 6"	-	21 ½"	332.6	503.4	6,500
	PEL-1-120	12 ¼" x 6"	-	22 ⅞"	353.2	564.3	6,800
	PEL-H1-120	12 ¼" x 6 ½"	-	25 ⅞"	387.8	674.0	7,425
	PEL-H2-120	12 ¼" x 7"	-	27 ⅞"	422.4	792.8	8,070
	PEL-H3-120	12 ¼" x 7 ¾"	-	29 ⅞"	453.7	908.0	8,710
	PEL-H4-120	12 ¼" x 8 ½"	-	31 ⅞"	484.9	1,030.5	9,360
	PEL-H5-120	12 ¼" x 9 ⅞"	-	33 ½"	517.9	1,167.5	10,000
125 FT.	PEL-2-125	12 ¼" x 6"	-	21 ½"	333.6	506.3	6,730
	PEL-1-125	12 ¼" x 6"	-	24 ¼"	375.1	632.5	7,400
	PEL-H1-125	12 ¼" x 6 ½"	-	25 ⅞"	389.1	678.1	7,740
	PEL-H2-125	12 ¼" x 7"	-	27 ⅞"	423.8	797.6	8,410
	PEL-H3-125	12 ¼" x 7 ¾"	-	29 ⅞"	455.1	913.5	9,080
	PEL-H4-125	12 ¼" x 8 ½"	-	31 ⅞"	486.5	1,036.7	9,760
	PEL-H5-125	12 ¼" x 9 ⅞"	-	33 ½"	519.5	1,174.5	10,430
130 FT.	PEL-2-130	14 ¼" x 6"	-	21 ½"	422.5	572.4	8,140
	PEL-1-130	14 ¼" x 6"	-	22 ⅞"	448.6	641.3	8,550
	PEL-H1-130	14 ¼" x 6 ½"	-	25 ⅞"	492.5	765.8	9,360
	PEL-H2-130	14 ¼" x 7"	-	27 ⅞"	536.4	900.7	10,180
	PEL-H3-130	14 ¼" x 7 ¾"	-	29 ⅞"	576.2	1,031.9	10,990
	PEL-H4-130	14 ¼" x 8 ½"	-	31 ⅞"	615.9	1,171.4	11,800
	PEL-H5-130	14 ¼" x 9 ⅞"	-	33 ½"	657.8	1,327.2	12,620
135 FT.	PEL-2-135	14 ¼" x 6"	-	22 ⅞"	448.8	641.9	8,880
	PEL-1-135	14 ¼" x 6"	-	24 ¼"	474.9	714.6	9,300
	PEL-H1-135	14 ¼" x 6 ½"	-	26 ½"	518.8	845.4	10,150
	PEL-H2-135	14 ¼" x 7"	-	27 ⅞"	536.6	901.5	10,570
	PEL-H3-135	14 ¼" x 7 ¾"	-	29 ⅞"	576.4	1,032.8	11,410
	PEL-H4-135	14 ¼" x 8 ½"	-	31 ⅞"	616.2	1,172.4	12,260
	PEL-H5-135	14 ¼" x 9 ⅞"	-	34 ⅞"	674.7	1,392.7	13,370
PEL-H6-135	14 ¼" x 10"	-	35 ⅞"	695.8	1,476.8	13,950	

NOTE: Many other sizes are available to meet special height or loading conditions.



# TANGENT POLE STANDARD SIZES

COASTAL DOUGLAS FIR

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**30FT - 135FT**

LARGER SIZES AVAILABLE AS REQUIRED

*View the E-LAM® installation  
video online at: [www.lwsinc.com](http://www.lwsinc.com)*

# E-LAM® COASTAL DOUGLAS FIR TANGENT POLES

Pole Length	Pole Class	Long. Width	Top Depth	Butt Depth	Ultimate Longitudinal Groundline Moment (Ft.-Kips)	Ultimate Transverse Groundline Moment (Ft.-Kips)	Approximate Treated Weight (Lbs.)
30 FT.	EL-5-30	6 ¾" x	5 ½"	9 ½"	35.0	45.3	430
	EL-4-30	6 ¾" x	6"	10 ½"	38.5	55.2	475
	EL-3-30	6 ¾" x	6 ½"	13"	47.0	82.3	560
	EL-2-30	6 ¾" x	7"	14"	50.7	95.5	605
	EL-1-30	6 ¾" x	7 ½"	15"	54.3	109.6	650
35 FT.	EL-5-35	6 ¾" x	5 ½"	11"	40.0	59.7	555
	EL-4-35	6 ¾" x	6"	12"	43.7	71.1	605
	EL-3-35	6 ¾" x	6 ½"	13"	47.3	83.4	655
	EL-2-35	6 ¾" x	7"	15 ½"	56.0	116.4	755
	EL-1-35	6 ¾" x	7 ½"	16 ½"	59.6	132.1	805
40 FT.	EL-5-40	6 ¾" x	5 ½"	12 ½"	45.6	77.4	690
	EL-4-40	6 ¾" x	6"	13 ½"	49.3	90.4	750
	EL-3-40	6 ¾" x	6 ½"	14 ½"	53.0	104.4	805
	EL-2-40	6 ¾" x	7"	15 ½"	56.7	119.5	865
	EL-1-40	6 ¾" x	7 ½"	18"	65.4	159.3	980
45 FT.	EL-5-45	8 ¾" x	5 ½"	11"	868.3	79.7	925
	EL-4-45	8 ¾" x	6"	12"	74.5	94.9	1,005
	EL-3-45	8 ¾" x	6 ½"	13"	80.8	111.3	1,090
	EL-2-45	8 ¾" x	7"	15 ½"	95.6	155.9	1,260
	EL-1-45	8 ¾" x	7"	17"	104.2	185.2	1,340
	EL-H1-45	8 ¾" x	7 ¼"	18 ¼"	111.6	212.5	1,425
	EL-H2-45	8 ¾" x	7 ¾"	19 ¼"	117.8	236.8	1,510
50 FT.	EL-5-50	8 ¾" x	5 ½"	12 ½"	77.1	101.6	1,120
	EL-4-50	8 ¾" x	6"	13 ½"	83.4	118.6	1,210
	EL-3-50	8 ¾" x	6 ½"	14 ½"	89.6	137.0	1,310
	EL-2-50	8 ¾" x	7"	15 ½"	95.8	156.7	1,400
	EL-1-50	8 ¾" x	7"	17"	104.5	186.3	1,490
	EL-H1-50	8 ¾" x	7 ¼"	19 ¾"	120.5	248.0	1,680
	EL-H2-50	8 ¾" x	7 ¾"	20 ¾"	126.8	274.3	1,770
55 FT.	EL-5-55	8 ¾" x	5 ½"	12 ½"	77.3	102.0	1,230
	EL-4-55	8 ¾" x	6"	13 ½"	83.5	119.1	1,330
	EL-3-55	8 ¾" x	6 ½"	16"	98.5	165.5	1,540
	EL-2-55	8 ¾" x	7 ¼"	18 ¼"	112.2	214.8	1,740
	EL-1-55	8 ¾" x	7 ¼"	19 ¾"	120.8	249.3	1,850
	EL-H1-55	8 ¾" x	7 ¼"	21 ¼"	129.5	286.4	1,950
	EL-H2-55	8 ¾" x	7 ¾"	22 ¼"	135.8	214.6	2,050
60 FT.	EL-3-60	8 ¾" x	6 ½"	16"	98.7	166.2	1,680
	EL-2-60	10 ¼" x	7 ¼"	16 ¾"	142.3	215.0	2,095
	EL-1-60	10 ¼" x	7 ¼"	18 ¼"	154.2	252.6	2,225
	EL-H1-60	10 ¼" x	7 ¼"	19 ¾"	166.2	293.2	2,355
	EL-H2-60	10 ¼" x	7 ¾"	22 ¼"	186.7	370.2	2,620
	EL-H3-60	10 ¼" x	8 ½"	23"	193.6	398.0	2,750
	EL-H4-60	10 ¼" x	9 ¼"	25 ¼"	212.5	479.2	3,010
	EL-H5-60	10 ¼" x	10"	26"	219.4	510.8	3,140
EL-H6-60	10 ¼" x	11"	28"	236.5	593.9	3,400	

# E-LAM® COASTAL DOUGLAS FIR TANGENT POLES

Pole Length	Pole Class	Long. Width		Top Depth	Butt Depth	Ultimate Longitudinal Groundline Moment (Ft.-Kips)	Ultimate Transverse Groundline Moment (Ft.-Kips)	Approximate Treated Weight (Lbs.)
65 FT.	EL-3-65	8 ¾"	x	6 ½"	- 17 ½"	107.6	197.5	1,940
	EL-2-65	10 ¼"	x	7 ¼"	- 16 ¾"	142.5	215.6	2,270
	EL-1-65	10 ¼"	x	7 ¼"	- 19 ¾"	166.5	294.3	2,550
	EL-H1-65	10 ¼"	x	7 ¼"	- 21 ¼"	178.5	338.2	2,695
	EL-H2-65	10 ¼"	x	7 ¾"	- 22 ¼"	187.1	371.5	2,835
	EL-H3-65	10 ¼"	x	8 ½"	- 24 ½"	206.0	450.3	3,120
	EL-H4-65	10 ¼"	x	9 ¼"	- 25 ¼"	212.8	480.9	3,260
	EL-H5-65	10 ¼"	x	10"	- 27 ½"	231.7	570.0	3,545
	EL-H6-65	10 ¼"	x	11"	- 29"	244.9	636.8	3,780
70 FT.	EL-3-70	8 ¾"	x	6 ½"	- 17 ½"	107.7	198.1	2,085
	EL-2-70	10 ¼"	x	7 ¼"	- 18 ¼"	154.7	254.2	2,595
	EL-1-70	10 ¼"	x	7 ¼"	- 19 ¾"	166.7	295.2	2,750
	EL-H1-70	10 ¼"	x	7 ¼"	- 21 ¼"	178.8	339.2	2,900
	EL-H2-70	10 ¼"	x	7 ¾"	- 23 ¾"	199.4	422.0	3,205
	EL-H3-70	10 ¼"	x	8 ½"	- 24 ¼"	206.3	451.7	3,360
	EL-H4-70	10 ¼"	x	9 ¼"	- 26 ¾"	225.2	538.3	3,665
	EL-H5-70	10 ¼"	x	10"	- 29"	244.1	632.5	3,970
	EL-H6-70	10 ¼"	x	11"	- 31"	261.3	724.8	4,275
75 FT.	EL-3-75	10 ¼"	x	6 ½"	- 17 ½"	148.0	232.6	2,620
	EL-2-75	10 ¼"	x	7 ¼"	- 18 ¼"	154.9	254.8	2,780
	EL-1-75	10 ¼"	x	7 ¼"	- 21 ¼"	179.0	340.2	3,110
	EL-H1-75	10 ¼"	x	7 ¼"	- 22 ¾"	191.0	387.5	3,270
	EL-H2-75	10 ¼"	x	7 ¾"	- 23 ¾"	199.7	423.3	3,435
	EL-H3-75	10 ¼"	x	8 ½"	- 26"	218.6	507.3	3,760
	EL-H4-75	10 ¼"	x	9 ¼"	- 28 ¼"	237.6	599.0	4,090
	EL-H5-75	10 ¼"	x	10"	- 30 ½"	256.5	698.3	4,415
	EL-H6-75	10 ¼"	x	11"	- 32 ½"	273.7	795.2	4,740
80 FT.	EL-3-80	10 ¼"	x	6 ½"	- 17 ½"	148.2	233.2	2,790
	EL-2-80	10 ¼"	x	7 ¼"	- 19 ¾"	167.1	296.6	3,140
	EL-1-80	10 ¼"	x	7 ¼"	- 21 ¼"	179.2	341.0	3,315
	EL-H1-80	10 ¼"	x	7 ¼"	- 22 ¾"	191.3	388.4	3,490
	EL-H2-80	10 ¼"	x	7 ¾"	- 25 ¼"	212.0	477.0	3,835
	EL-H3-80	10 ¼"	x	8 ½"	- 27 ½"	230.9	566.1	4,185
	EL-H4-80	10 ¼"	x	9 ¼"	- 28 ¼"	237.8	600.4	4,360
	EL-H5-80	10 ¼"	x	10"	- 30 ½"	256.8	700.0	4,710
	EL-H6-80	12 ¼"	x	11"	- 29 ½"	357.0	792.2	5,625
85 FT.	EL-3-85	10 ¼"	x	6 ½"	- 19"	160.4	273.2	3,150
	EL-2-85	10 ¼"	x	7 ¼"	- 19 ¾"	167.3	297.2	3,335
	EL-1-85	10 ¼"	x	7 ¼"	- 22 ¾"	191.5	389.3	3,705
	EL-H1-85	10 ¼"	x	7 ¼"	- 24 ¼"	203.6	440.0	3,890
	EL-H2-85	10 ¼"	x	7 ¾"	- 25 ¼"	212.2	478.1	4,075
	EL-H3-85	10 ¼"	x	8 ½"	- 27 ½"	231.2	567.4	4,445
	EL-H4-85	10 ¼"	x	9 ¼"	- 29 ¾"	250.2	664.4	4,820
	EL-H5-85	12 ¼"	x	10"	- 29"	350.0	761.4	5,755
	EL-H6-85	12 ¼"	x	11"	- 31"	374.6	872.4	6,200

# E-LAM® COASTAL DOUGLAS FIR TANGENT POLES

Pole Length	Pole Class	Long. Width	Top Depth	Butt Depth	Ultimate Longitudinal Groundline Moment (Ft.-Kips)	Ultimate Transverse Groundline Moment (Ft.-Kips)	Approximate Treated Weight (Lbs.)
<b>90 FT.</b>	EL-3-90	10 ¼" x	6 ½"	19"	160.6	273.7	3,335
	EL-2-90	12 ¼" x	7 ¼"	19 ¾"	239.2	355.9	4,220
	EL-1-90	12 ¼" x	7 ¼"	21 ¼"	256.5	409.2	4,455
	EL-H1-90	12 ¼" x	7 ¼"	22 ¾"	273.8	466.2	4,690
	EL-H2-90	12 ¼" x	7 ¾"	25 ¼"	303.4	572.5	5,160
	EL-H3-90	12 ¼" x	8 ½"	26"	313.3	610.2	5,395
	EL-H4-90	12 ¼" x	9 ¼"	28 ¼"	340.4	720.5	5,860
	EL-H5-90	12 ¼" x	10"	30 ½"	367.5	840.0	6,330
<b>95 FT.</b>	EL-H6-90	12 ¼" x	11"	32 ½"	392.2	956.4	6,800
	EL-2-95	12 ¼" x	7 ¼"	19 ¾"	240.3	359.0	4,455
	EL-1-95	12 ¼" x	7 ¼"	21 ¼"	257.7	413.0	4,705
	EL-H1-95	12 ¼" x	7 ¼"	24 ¼"	292.5	532.1	5,195
	EL-H2-95	12 ¼" x	7 ¾"	25 ¼"	304.9	578.1	5,445
	EL-H3-95	12 ¼" x	8 ½"	27 ½"	332.2	686.1	5,940
	EL-H4-95	12 ¼" x	9 ¼"	29 ¾"	359.4	803.3	6,435
	EL-H5-95	12 ¼" x	10"	30 ½"	369.3	847.9	6,680
<b>100 FT.</b>	EL-H6-95	12 ¼" x	11"	32 ½"	394.0	965.3	7,175
	EL-2-100	12 ¼" x	7 ¼"	21 ¼"	258.8	416.4	4,950
	EL-1-100	12 ¼" x	7 ¼"	22 ¾"	276.3	474.7	5,210
	EL-H1-100	12 ¼" x	7 ¼"	24 ¼"	293.8	536.8	5,470
	EL-H2-100	12 ¼" x	7 ¾"	26 ¾"	323.7	651.8	5,990
	EL-H3-100	12 ¼" x	8 ½"	27 ½"	333.6	692.0	6,255
	EL-H4-100	12 ¼" x	9 ¼"	29 ¾"	361.0	810.3	6,770
	EL-H5-100	12 ¼" x	10"	32"	388.4	937.8	7,295
<b>105 FT.</b>	EL-H6-100	12 ¼" x	11"	34"	413.2	1,061.5	7,815
	EL-2-105	12 ¼" x	7 ¼"	21 ¼"	258.0	413.8	5,195
	EL-1-105	12 ¼" x	7 ¼"	22 ¾"	275.4	471.7	5,470
	EL-H1-105	12 ¼" x	7 ¼"	24 ¼"	292.9	533.3	5,745
	EL-H2-105	12 ¼" x	7 ¾"	26 ¾"	322.7	647.5	6,290
	EL-H3-105	12 ¼" x	8 ½"	29"	350.0	761.6	6,835
	EL-H4-105	12 ¼" x	9 ¼"	31 ¼"	377.3	885.0	7,385
	EL-H5-105	12 ¼" x	10"	33 ½"	404.6	1,017.7	7,930
<b>110 FT.</b>	EL-H6-105	12 ¼" x	11"	35 ½"	429.3	1,146.1	8,475
	EL-2-110	12 ¼" x	7 ¼"	22 ¾"	276.5	475.3	5,730
	EL-1-110	12 ¼" x	7 ¼"	24 ¼"	294.0	537.6	6,015
	EL-H1-110	12 ¼" x	7 ¼"	25 ¾"	311.6	603.6	6,305
	EL-H2-110	12 ¼" x	7 ¾"	28 ¼"	341.5	725.3	6,875
	EL-H3-110	12 ¼" x	8 ½"	29"	351.4	767.7	7,165
	EL-H4-110	12 ¼" x	9 ¼"	31 ¼"	378.8	862.1	7,735
	EL-H5-110	12 ¼" x	10"	35"	423.7	1,116.3	8,595
EL-H6-110	12 ¼" x	11"	37"	448.5	1,251.0	9,165	



# E-LAM® COASTAL DOUGLAS FIR TANGENT POLES

Pole Length	Pole Class	Long. Width	Top Depth	Butt Depth	Ultimate Longitudinal Groundline Moment (Ft.-Kips)	Ultimate Transverse Groundline Moment (Ft.-Kips)	Approximate Treated Weight (Lbs.)
115 FT.	EL-2-115	12 ¼" x	7 ¼"	24 ¼"	295.1	541.4	6,290
	EL-1-115	12 ¼" x	7 ¼"	25 ¾"	312.7	608.1	6,590
	EL-H1-115	12 ¼" x	7 ¼"	27 ¼"	330.4	678.6	6,890
	EL-H2-115	12 ¼" x	7 ¾"	29 ¾"	360.4	807.9	7,490
	EL-H3-115	12 ¼" x	8 ½"	30 ½"	370.3	852.6	7,785
	EL-H4-115	12 ¼" x	9 ¼"	32 ¾"	397.8	983.9	8,385
	EL-H5-115	12 ¼" x	10"	35"	425.3	1,124.6	8,985
120 FT.	EL-2-120	12 ¼" x	7 ¼"	24 ¼"	296.0	545.0	6,565
	EL-1-120	12 ¼" x	7 ¼"	25 ¾"	313.8	612.2	6,875
	EL-H1-120	12 ¼" x	7 ¼"	28 ¾"	349.2	758.4	7,500
	EL-H2-120	12 ¼" x	7 ¾"	29 ¾"	361.7	813.5	7,815
	EL-H3-120	12 ¼" x	8 ½"	32"	389.3	942.3	8,440
	EL-H4-120	12 ¼" x	9 ¼"	34 ¼"	416.8	1,080.5	9,065
	EL-H5-120	12 ¼" x	10"	36 ½"	444.4	1,228.1	9,690
125 FT.	EL-2-125	12 ¼" x	7 ¼"	24 ¼"	296.9	548.3	6,835
	EL-1-125	12 ¼" x	7 ¼"	25 ¾"	314.7	616.0	7,165
	EL-H1-125	12 ¼" x	7 ¼"	28 ¾"	350.4	763.3	7,810
	EL-H2-125	12 ¼" x	7 ¾"	29 ¾"	362.9	818.7	8,140
	EL-H3-125	12 ¼" x	8 ½"	32"	390.5	948.2	8,790
	EL-H4-125	12 ¼" x	9 ¼"	34 ¼"	418.2	1,087.3	9,440
	EL-H5-125	12 ¼" x	10"	36 ½"	445.8	1,235.8	10,090
130 FT.	EL-H6-125	12 ¼" x	11"	38 ½"	470.8	1,378.3	10,740
	PEL-2-130	14 ¼" x	7 ¼"	24 ¼"	396.0	609.6	8,270
	PEL-1-130	14 ¼" x	7 ¼"	25 ¾"	419.6	680.4	8,670
	PEL-H1-130	14 ¼" x	7 ¼"	28 ¾"	443.2	754.9	9,060
	PEL-H2-130	14 ¼" x	7 ¾"	29 ¾"	483.5	890.7	9,850
	PEL-H3-130	14 ¼" x	8 ½"	32"	520.4	1,024.3	10,630
	PEL-H4-130	14 ¼" x	9 ¼"	34 ¼"	557.3	1,166.7	11,420
135 FT.	PEL-H5-130	14 ¼" x	10"	36 ½"	594.2	1,317.8	12,210
	PEL-H6-130	14 ¼" x	11"	38 ½"	627.7	1,462.5	13,000
	PEL-2-135	14 ¼" x	7 ¼"	22 ⅞"	448.8	641.9	8,880
	PEL-1-135	14 ¼" x	7 ¼"	24 ¼"	474.9	714.6	9,300
	PEL-H1-135	14 ¼" x	7 ¼"	26 ½"	518.8	845.4	10,150
	PEL-H2-135	14 ¼" x	7 ¾"	27 ⅞"	536.6	901.5	10,570
	PEL-H3-135	14 ¼" x	8 ½"	29 ⅞"	576.4	1,032.8	11,410
PEL-H4-135	14 ¼" x	9 ¼"	31 ⅞"	616.2	1,172.4	12,260	
PEL-H5-135	14 ¼" x	10"	34 ⅞"	674.7	1,392.7	13,370	
PEL-H6-135	14 ¼" x	11"	35 ⅞"	695.8	1,476.8	13,950	

NOTE: Many other sizes are available to meet special height or loading conditions.

# INSTALLING E-LAM® TANGENT, GUYED ANGLE AND GUYED DEAD END LAMINATED WOOD STRUCTURES

## IDENTIFICATION OF POLES

Each E-LAM® laminated wood pole is tagged with the class and length on the face and the butt. If a variety of poles are required on a project, make sure the appropriate pole is spotted at the correct structure location. Additionally, poles of the same class may be drilled for different structures, and verification of structure types should also be confirmed.

## LIFTING

All poles are identified with “BP” on the face of the width (constant dimension) to identify the approximate balance point before any framing materials are added. The approximate weight of the treated pole will also be located at this point. The poles should be lifted with a steel choker or gut line rather than a flat nylon strap. The choker will slightly indent the edges on the rounded corners insuring a firm hold.

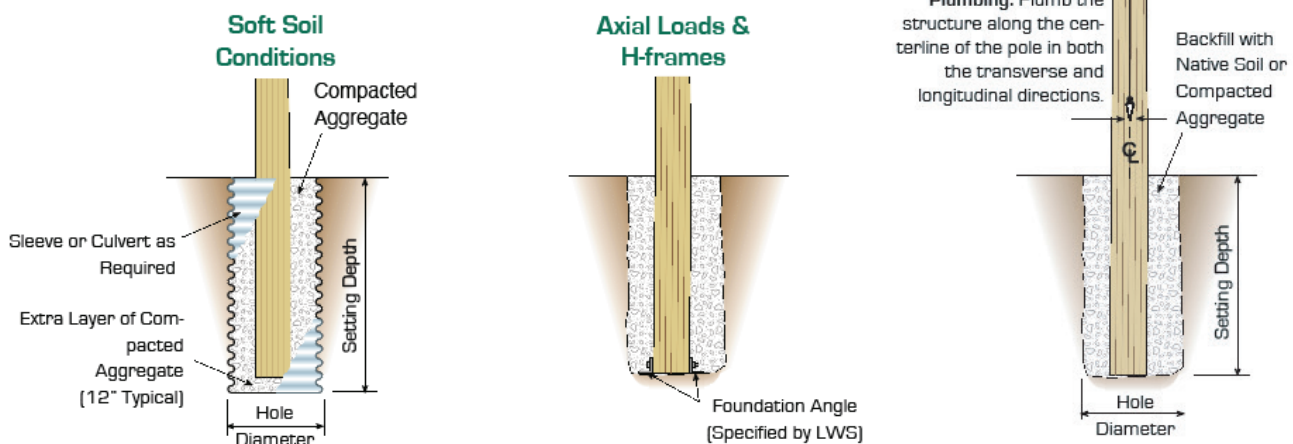


## HANDLING

Poles can be handled just like any other wood pole. If rotation is required to bisect the angle, a regular cant hook for round poles can be used. Any field drilling and preservative treatment application should be consistent with the user’s accepted practices for wood products. *These are general recommendations and in no way should be given precedence when they come in conflict with an individual company’s accepted and established working practices.*

## SETTING RECOMMENDATIONS

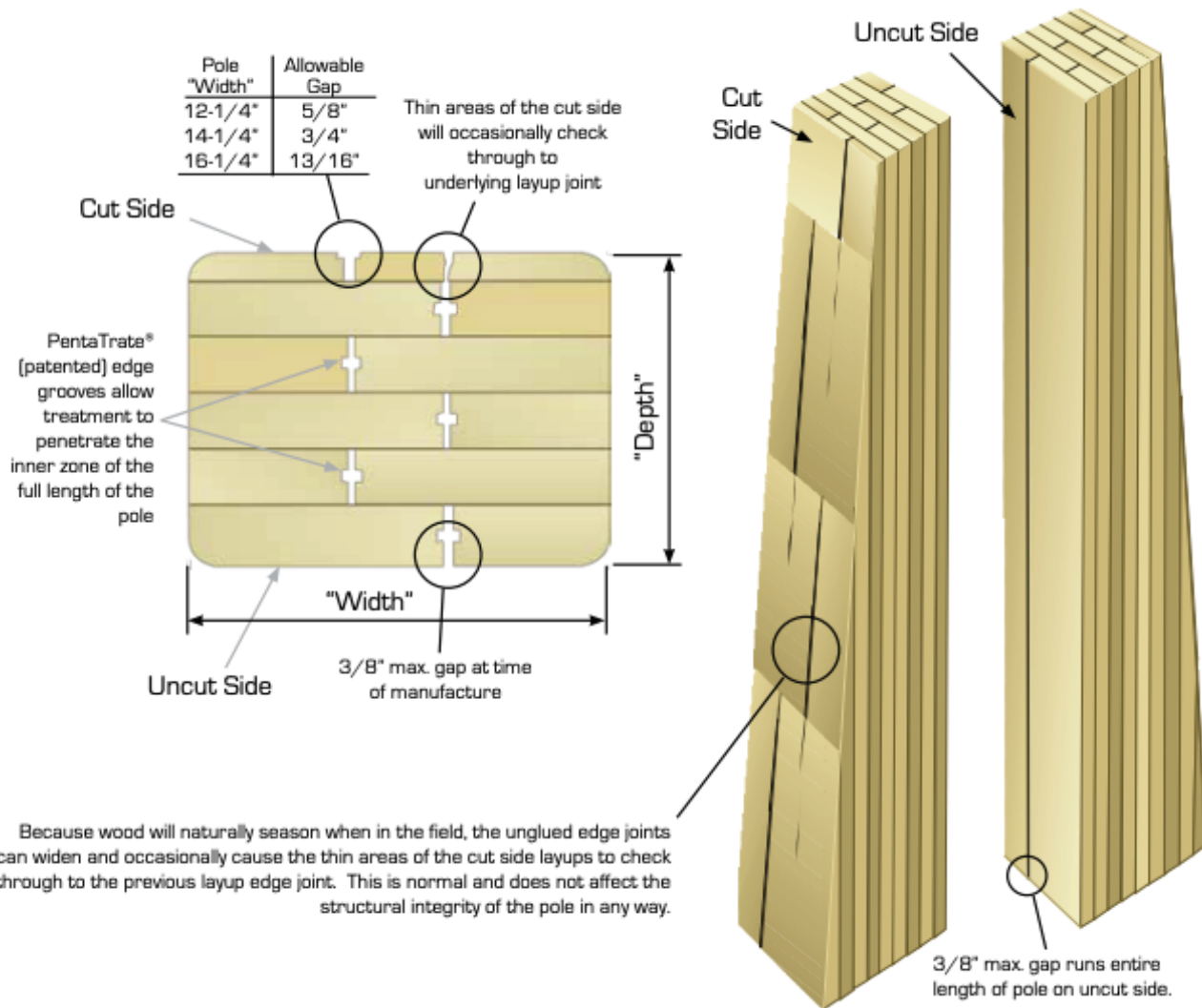
Auger hole to diameter and depth as recommended by LWS. Generally, E-LAM® tangent poles should be set to a depth of 10% + 2 ft. (unless soil type and / or load conditions require additional depth - contact LWS for recommended setting depth, hole size and any other options such as foundation systems).



# UNGLUED EDGE JOINT SPECIFICATIONS FOR E-LAM® LAMINATED WOOD POLES

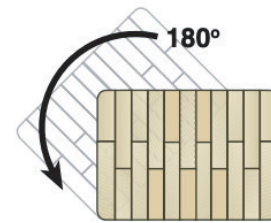
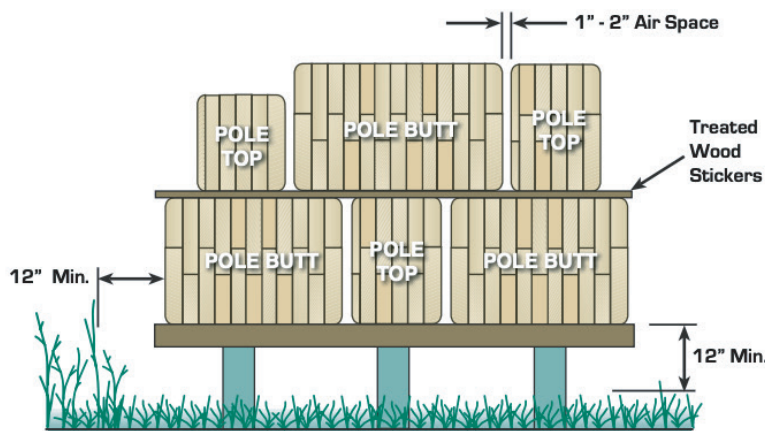
All E-LAM® Southern Pine and Coastal Douglas-fir poles are manufactured in accordance to ANSI 05.2-(latest version) standards for the manufacture of laminated wood structural members. The following is a portion of the manufacturing standard that applies to unglued edge joints.

*Edge Joints - Edge joints bonding shall not be required unless specified by the designer as a response to structural requirements. Edge spacing in top and bottom laminations may be up to 1/4 in. for the full length with occasional 3/8 in. gap permitted. Edge spacing in interior laminations shall not exceed 3/8 in. for nominal widths of 10 in. and less, 1/2 in. for 12 in. nominal widths and 5/8 in. for 14 in. nominal widths. For nominal widths wider than 14 in., the allowable opening shall be proportional to the opening allowed for a nominal width of 14 in.*



## PROPER LONG TERM STORAGE OF ENGINEERED LAMINATED WOOD POLES

When it becomes necessary to store E-LAM® Southern Pine or Coastal Douglas-fir poles for extended periods of time (three months or longer) it is recommended the poles be stored in accordance with the following AWP and/or REA standards. In addition to these storage practices, laminated wood poles should also be rotated 180° and re-stacked at least once a year to minimize uneven migration of preservative treatment. This migration helps recharge the pole's internal groundline zone once the pole is installed.

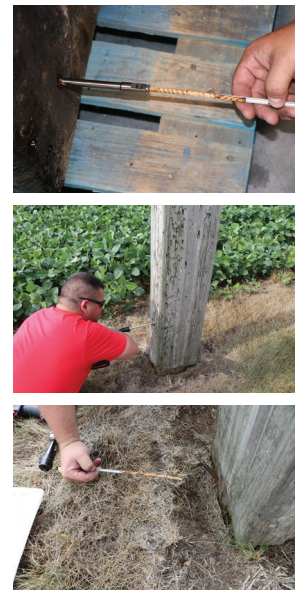


**Rotate Poles 180° At Least Once Per Year To Minimize Uneven Migration of Preservative Treatment**

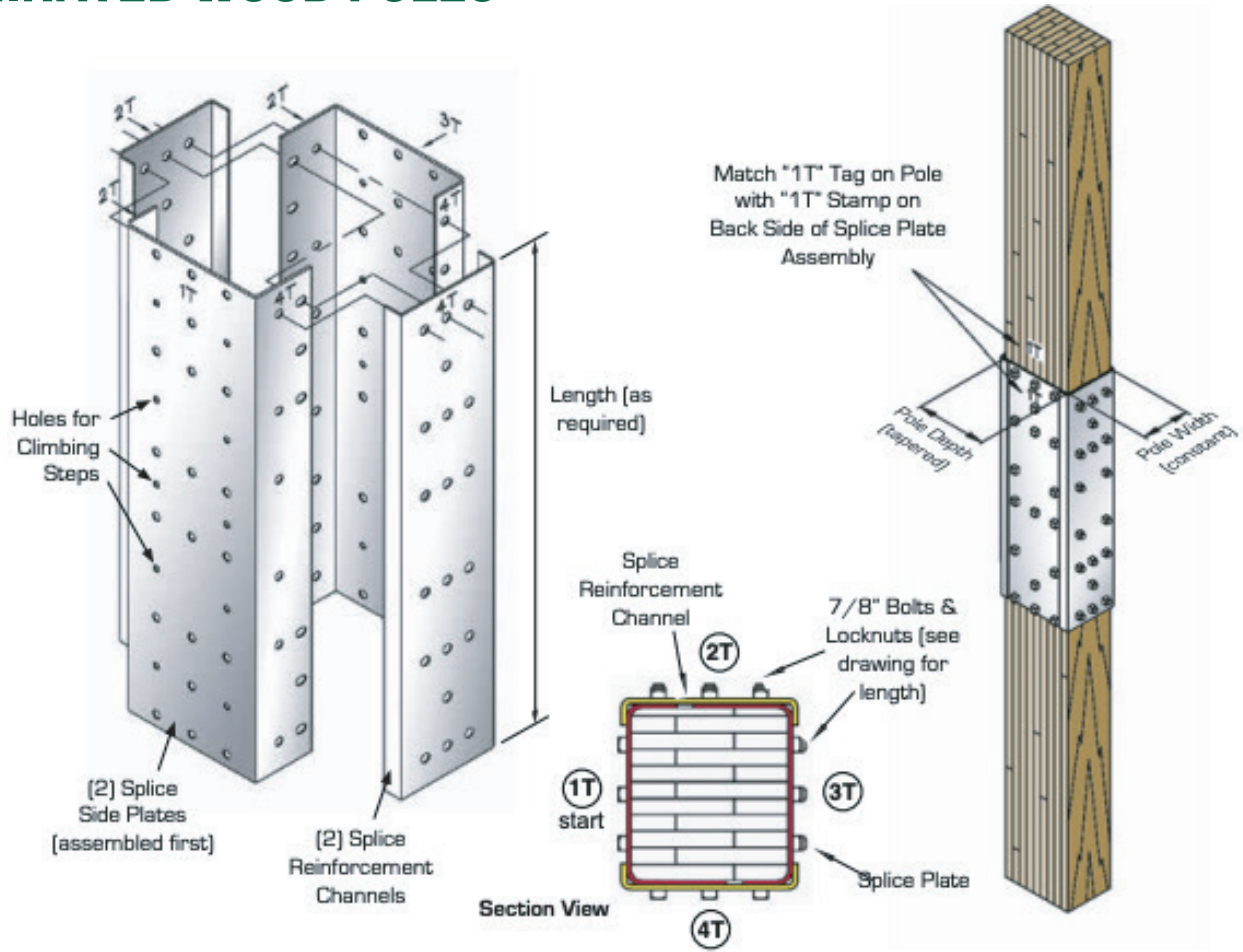
NOTE: Preservative migration helps recharge the pole's internal groundline zone once the pole is installed.

## GUIDELINE FOR THE PHYSICAL INSPECTION OF ENGINEERED LAMINATED WOOD POLES

It is recommended that laminated wood poles be included with the utility's normal round wood pole inspection cycle using typical methods such as sounding with a hammer. Suspect areas should be further examined by a small diameter drill or core boring tool. After inspection, these holes should be flooded with preservative and closed by inserting treated plugs. If decay is detected, poles with enclosed pockets should be flooded internally and treated externally with a preservative. All holes should be flooded with preservative and closed by inserting treated plugs. If a defect is identified, the individual structure should be evaluated by the owner and the supplier (LWS) to determine if it meets the owner's structural loading requirements.



# SPLICE ASSEMBLIES FOR E-LAM® LAMINATED WOOD POLES



# E-LAM® ENGINEERED LAMINATED WOOD STRUCTURES - FIRE RESISTANCE

E-LAM® laminated wood structure after a grass fire shows minimal char and less than 1% reduction in strength.



Heavy wood construction develops a char at the rate of 1/40 in (0.65 mm) per minute under an ASTM E-119 fire exposure test.

Glulam laminated wood sample during (top photo) and after (bottom photo) ASTM E-119 fire exposure test.

### ASTM E-119 TIME & TEMPERATURE TABLE

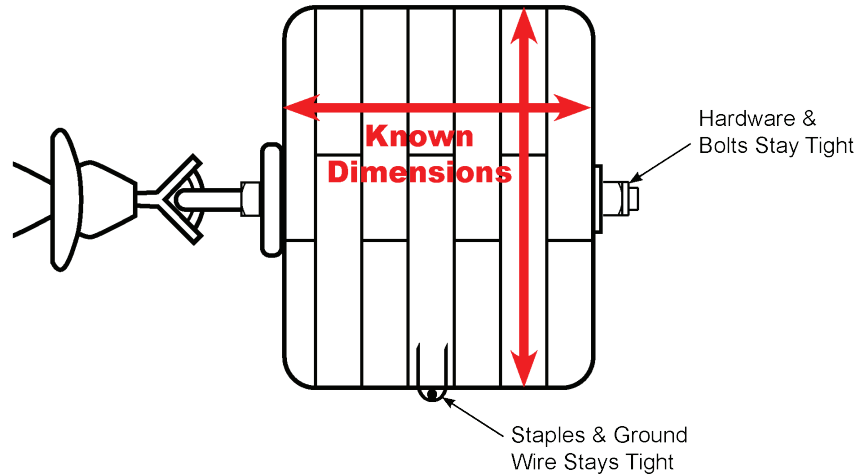
5 min - 1,000 °F  
 10 min - 1,300 °F  
 30 min - 1,550 °F  
 1 hr - 1,700 °F

Engineered wood beams as small as 6-3/4" x 13-1/2" can be assigned a one-hour fire rating.

Fire Type	Fire Exposure	Char Thickness	% of Strength Reduction W= 12.25 in. D= 36 in.
Grass Fire @ 1,500 °F	1 Minute	0.025 in	1.00%
Brush Fire @ 1,500 °F	5 Minutes	0.125 in	4.00%
Tall Brush Fire @ 1,500 °F	7 Minutes	0.175 in	5.00%
Crown Forest Fire @ 2,000 °F	10 Minutes	0.25 in	7.00%

# E-LAM® ENGINEERED LAMINATED WOOD STRUCTURES - FIRE RESISTANCE

MINIMIZE POLE FIRES DUE TO LOOSE GROUND WIRE TO POLE HARDWARE CONNECTIONS. ENGINEERED E-LAM® STRUCTURE MEMBERS ARE FABRICATED PER ANSI O5.2 OUT OF KILN DRIED LUMBER WITH INSIGNIFICANT SHRINKAGE IN THE FIELD.



# LWS

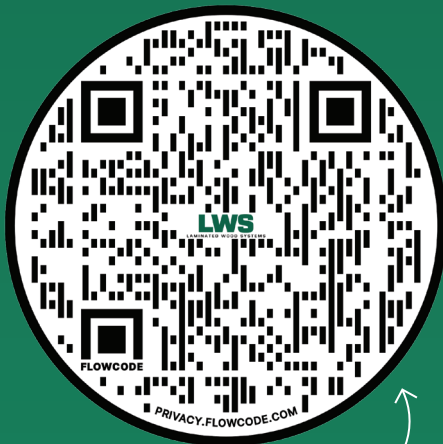
LAMINATED WOOD SYSTEMS

Founded in 1992, Laminated Wood Systems is a leader in supplying innovative products for the worldwide electric utility infrastructure. LWS reintroduced glue laminated utility structures to the industry and soon after developed its' family of steel products.

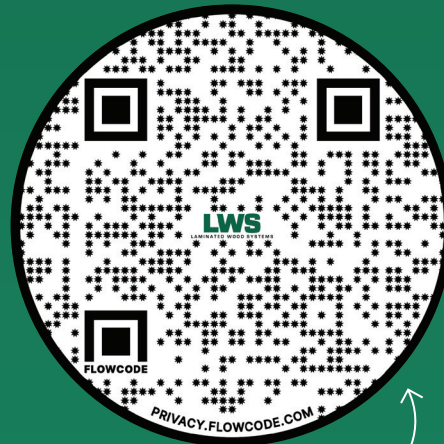
Utilizing a network of manufacturing and treating facilities located throughout the US, LWS can maintain some of the quickest delivery lead times available in the industry.

The LWS sales and engineering offices are located in Seward, Nebraska. LWS partners with nationwide independent sales agencies to move our quality products to market.

Visit [www.lwsinc.com](http://www.lwsinc.com) for more information on all LWS Products and to locate a sales representative in your area.



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