



- Direct Embed
- Engineered Strength
- Natural Beauty
- Low Maintenance
- Low Cost
- Quick Delivery
- 60 Year+ Service Life



Laminated Wood Systems, Inc.



Des Moines, IA



59' Clock Tower - Luverne, CA



800 • 949 • 3526 Fax 402 • 643 • 4374

PhotoSimulation

Streamline Permitting and Site Acquisition with FREE Photo Simulation Services from LWS

When E-LAM structures are specified, we provide FREE imaging showing laminated wood construction. Simply provide us with a good quality photo of the proposed site with some reference of scale, and we will

render an accurate simulation. Let us help streamline your next site proposal with the most realistic and naturally beautiful choice...E-LAM laminated wood structures from LWS!



ORIGINAL PHOTO



PHOTO SIMULATION



ACTUAL STRUCTURE



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ENGINEERED LAMINATED WOOD ANTENNA STRUCTURES

INNOVATIVE TOWER SOLUTIONS



- MONO-POLE
- JOINT-USE
- DECORATIVE
- CONCEALMENT



DIRECT-EMBED TOWERS AND STRUCTURES THAT REQUIRE NO COSTLY FOUNDATIONS



Laminated Wood Systems, Inc.



■ JOINT USE TOWERS



■ MONO POLE TOWER



■ JOINT USE TOWER



■ MONO POLE AND MICROWAVE TOWER



■ EVERGREEN

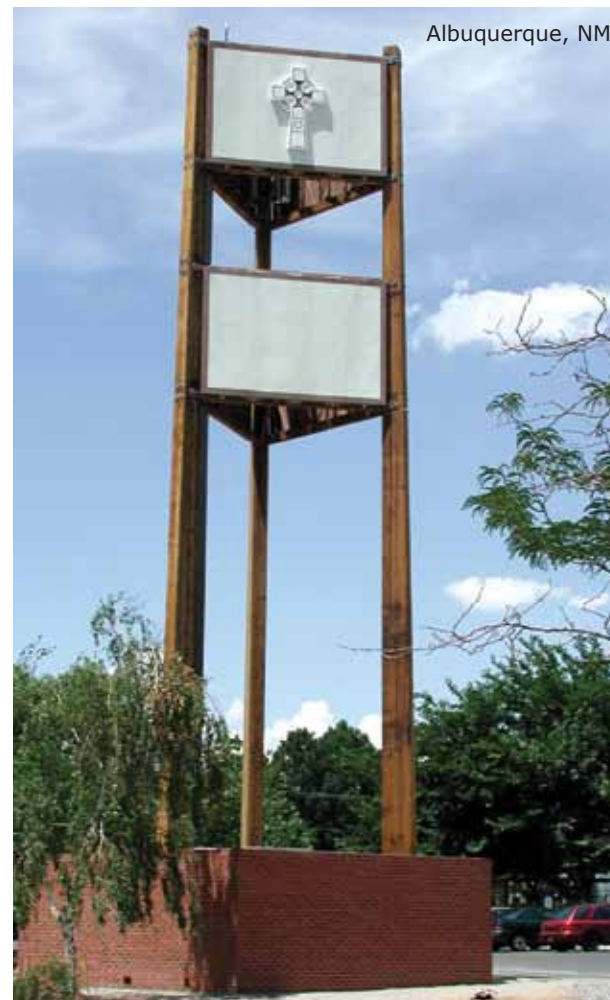
■ PALM W/BALL



■ ARCHITECTURAL TOWERS



■ THREE POLE CHURCH TOWERS



■ 3 POLE BELL TOWER



■ WATER TOWER STRUCTURES

The Facts:

- Will not twist
- Engineered strength
- Direct embed
- Minimal deflection
- Quick delivery
- Low cost
- Natural beauty
- 60+ yr service life
- Won't rust
- Poles up to 165'

Laminated wood has been used as a structural member since the 30's, and has been used in the utility industry since the 60's. It has withstood the tests of time and the elements. Laminated wood towers from LWS combine natural beauty and engineered strength resulting in a perfect solution for today's telecommunications needs. From mono poles to beautiful architectural designs, laminated wood towers from LWS are your solution. That is a FACT!

Attractive, Natural Appearance

Laminated wood towers enjoy widespread public acceptance and blend into most any setting naturally because of their natural wood grained appearance. No metal tower can match the natural beauty of laminated wood towers from LWS.

As laminated poles are already dry, deep checks never develop. A recent survey of laminated poles installed in 1963 found no evidence of deterioration after nearly 30 years of service!

systems, including antenna brackets, safety cable climb kits, climbing steps, cable cover trays, etc.

Tower Production

Laminated towers are fabricated using plantation grown Southern Pine and Coastal Douglas fir. No old growth trees are used. Select lumber is kiln-dried to 15% moisture content. Drying insures that no cracking, bending or twisting can occur at a later date. Mildew, fungi, and insects are killed in the sterilization process.

Large deviations are cut out and discarded, then each piece of high quality clean lumber is further graded. Pieces of similar strength are finger jointed into long boards. After curing, every finger joint is load tested to insure that no bad joints are passed into production.

The full-length boards are laminated into the beam shape according to a plan dictated by the design engineer. Stronger lumber is used on the outside of the structure, lower grade pieces in the interior. Grain orientation is specified and slots can be milled into the appropriate boards for internal cable guides. After laminating, the resin cures for six to eight hours, after which the edges of the pole are rounded and any drilling takes place.

Priced Right with Fast Delivery

E-LAM[®] laminated wood towers are economical. Most any design can be built at a lower cost, with a quicker delivery than is possible with steel towers.

E-LAM[®] laminated wood towers are normally shipped in six to eight weeks after an order and confirmation of drawings, compared with a much longer delivery time for steel towers.

Environmentally Smart

There is no adverse environmental impact at any stage of the production of E-LAM[®] towers, from plantation grown lumber to milling, lamination or installation. E-LAM[®] laminated wood towers are:

- A renewable resource constructed of sterile, kiln-dried tree-farm lumber, not old growth forests

Joint-Use Applications Benefit Utility & Telecommunications Companies

E-LAM[®] laminated wood towers are used jointly with electric utilities, working to the advantage of both utility and telecommunications companies. Laminated Wood Systems has the experience and understanding for both industries to design structures to meet all loading conditions.

Direct Embed Installation

E-LAM[®] towers are designed for direct embedment using select aggregate backfill or concrete, thus eliminating expensive foundation and installation costs.

Poles will not freeze/push out of aggregate, but they can be pulled later if relocation is necessary.

In very loose soils, the laminated tower is installed in a section of corrugated steel or concrete culvert and set vertical in the hole. Both the hole and the culvert are then back filled with crushed aggregate or concrete.

Antenna Mounts

Laminated wood towers have no adverse effects on antenna performance, so antennas can be mounted directly to the mast faces or on very short standoffs.

Vertical pipe mounts for omni-directional, flat panel and microwave antennas are included as required. These mounts are constructed of welded, galvanized or painted steel. When the locations are known, the tower will be pre-drilled for easy assembly in the field. They can also be drilled in the field if additional hardware is required.

Proven History

The life of laminated telecommunication towers is estimated at 100 years.

To prevent any form of ground-based damage, rot, mildew or insect damage, the entire new laminated tower is submerged and pressure-treated three to four inches into the kiln-dried lumber; twice the depth achieved in round wooden poles. All drilled holes and cable guides are treated, inside and out.

Complete Tower/Systems Designs

E-LAM[®] laminated telecommunication towers are designed to EIA/TIA-222-E, UBC or AASHTO standards. Load calculations, assembly drawings and engineering sign-off are included.

Laminated Wood Systems offers all of the necessary design calculations and will recommend foundation parameters for your tower. We also offer complete