

Cedar Pole NEWS

Eastern Utility Relies on Cedar

W The City of Wadsworth, OH began using Western Red Cedar poles in the late 1940's, moved to other species, and returned to using cedar in the 1980's. As many utilities have found, cedar poles have a long service life, withstand extreme weight and severe weather, and are lightweight -- making them easy to handle and install.

Justifiably proud, last year Wadsworth Electric and Communications Dept. was awarded the **Platinum Level Reliable Public Power Distinction Award** by the American Public Power Association. To achieve this prestigious award, a utility must successfully meet criteria in four areas: reliability, safety, training, and system improvement.

Committed to customer service, Wadsworth's average time to restore service per interrupted customer is 20.87 minutes, compared to the national average of 65.91 minutes.

The city also has a key account program where major customers are regularly visited to obtain customers'

views on power service, and ways to improve service.

Founded in 19416 Wadsworth has seen a 30-fold increase in power consumption. The city's service area is about 70 sq. miles, and has 12,000 connections for their population of 16,000.

With 18 miles of 69kV transmission line, 75 ft. to 95 ft. H-2 cedar poles are used. The 125 mles of 12.5 kV distribution line uses 45ft. and 50 ft. Class 4 cedar poles.

Power is provided to Wadsworth primarily by American Municipal Power--Ohio (AMP Ohio). Some 90% of the power generation is from coal fired plants. Hydro generation, five percent of the power supply, is from dams on the Ohio River, and from Niagara Falls. The remaining power generation is nuclear, wind, and methane gas from landfills.

The utilities' primary consumption is residential users at 70%,. Industrial users account for 20%, and commercial use is about 10%. There are a number of polymer manufacturers in the area that produce plastic bottles, car parts, toys and other items.



This street that crosses Interstate 75 uses 95 ft. H-2 Western Red Cedar poles and carries both 12.5kV distribution lines and 69kV transmission lines as part of the loop system around the city of Wadsworth.

Ohio Utility Continues Its Use of Cedar



Left, the city also installs and maintains their own cable and internet systems. They service 3,800 cable customers and 2,600 internet users. This part of Wadsworth's loop line carries both transmission and distribution lines, as well as significant cable underbuild.



Think snow! And when it snows, most kids young and old want to go sledding. A public service project, right, the city created a sled hill during the expansion of the substation at Holmsbrook Valley Park for a safe place to sled.

RP₃: Reliable Public Power Provider Program

As noted in the Wadsworth utility story, the American Public Power Association has set standards for certification to be awarded for being a "Reliable Public Power Provider."

This program focuses on reliability, safety, training and system improvement. Each area has a criteria that utilities need to meet to receive this distinction.

The criteria to define *reliability* are balanced between statisti-

cal analysis and proof of membership in mutual aid, along with disaster preparation.

The Occupational Safety and Health Administration Incident Rates benchmarks commitment to *safety*, and the utility must prove it uses and has an accepted safety manual for safe work practices.

Membership in state, regional and nationally focused committees are key to evaluating that the utility values *training*.

Utilities must demonstrate participation in a national research and development program, and regularly perform projects to maintain the system's integrity and efficiency to qualify for *system improvement* credit.

With more than 2,000 public power utilities, Wadsworth Electric and Communications Dept. is one of 64 public power utilities that have earned the Reliable Public Power recognition.

The Wood Pole: Design Considerations, Service Benefits, and Economic Rewards

A partial reprint of the North American Wood Pole Council Technical Bulletin, this publication was prepared by Hi-Line Engineering, LLC, W. Richard Lovelace. For the entire technical bulletin, and more information about wood poles the reader can access www.woodpoles.org. To learn about design and application, access the Hi-Line Engineering website at www.hi-line-engineering.com for a schedule of nationwide seminars.

Introduction

Since the beginning of electrification over a century ago, the wood pole has been at the heart of providing electrical service to the people of North America. Transmission and distribution lines deliver power to large cities, small towns, and remote outposts. Due to the continued advancements in wood preserving and engineering technology combined with its natural benefits and economics, the wood pole remains the foundation of power distribution in the 21st century. With over 130 million wood poles in service and millions of new wood poles installed each year, it is little wonder the Utility Industry has stated that "TREATED WOOD IS THE ELECTRIC UTILITIES' MATERIAL OF CHOICE". Proper line design, pole selection and installation are the keys to the successful use of the wood pole. As an electrical distribution design and professional training consulting firm, Hi-Line Engineering is pleased to have been asked to provide its perspective on the design and use of the wood pole.

ABC'S of Structure Design

This section covers the fundamentals of electrical distribution line construction. Included are NESC Loading Districts and Applied Loads, Selecting a Tagent Pole Class,

Transverse wind load for 1 ft. of specified conductor, Wood fiber strength, Ultimate resisting movement of a 45-ft. class 4 pole, NESC Overload and Strength Reduction Factors, Relationship of equivalent size wood, steel, and pre-stressed concrete poles, Basic Impulse Insulation Level (BIL), Raptor Protection, and Flexibility.

Installation

Wood Poles are easier to handle, store, and work with than alternative materials. They can be stacked in bundles in the pole yard without cribbing. Wood poles can be loaded onto the bare steel pole trailer using metal cables and standard rigging. No provision is needed to cushion the trailer rails or protect the exterior pole from scratches or scrapes. Standard utility digger-derrick trucks are adequate to handle and set wood poles up to 70-ft. in height. In most cases, wood poles can be backfilled with the same materials that was excavated from the pole hole. For additional strength, gravel backfill may be used to provide a more substantial foundation. Tamping can be done with hydraulic or hand tamps without worry over damaging the exterior surface of the pole. The larger butt section and rougher texture of wood provides substantial adhesion to the embedment soil.

Holes are easily bored in wood poles with conventional drills for any combination of assemblies. Newly bored holes can easily be field treated by swabbing with a preservative. Standard guy attachment hardware using lag bolts or cleats to anchor the lower end of the attachment

to provide strength and prevent guy rotation can be used on wood poles.

A significant number of poles on a utility's system can be worked more efficiently by climbing linemen than with a bucket truck. Wood poles are easily climbed using traditional climbing tools. No special pole steps must be included in the design or purchase. This feature is not only beneficial for remote areas but also for subdivisions back lot lines and yards that are not readily accessible to standard aerial lifts.

Duty Cycle

How long will wood poles last in service is a common and important question. With a continuing inspection and maintenance program, it has been shown that pole service life can reach 75 years or beyond. Steel and concrete claim life spans of 80 years, but the products have not been used long enough in direct burial installations to fully evaluate the impact of age and corrosion. However, the **duty cycle** (service life) of a pole depends largely on factors other than the condition of the pole. More often than not, a pole is replaced not because it has deteriorated beyond its inherent strength to support the conductors, but because a line is upgraded, roads are widened, or land is developed. A significant number of poles are replaced due to these factors rather than to deterioration. These poles can be reused at other locations or recycled for non-utility applications. In fast growth areas with short duty cycles caused by frequent upgrades, development, or road widening, the lower cost of wood has a distinct economic advantage over the alternatives.



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2405-61st Ave. S.E., Mercer Island, WA 98040
800-410-1917, 206-275-4753, Fax: 206-275-4755
email: info@wrcpa.org

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The Wood Pole: Design Considerations, Service Benefits, and Economic Rewards

Economics

The cradle to grave life cycle costs of pole materials is a key concern in design and purchasing decisions. Where duty cycles are short, wood has a clear advantage. Where longer service life is needed, the cost of inspection and maintenance must be incorporated into the decision as well as cost of disposal of the product at the end of its useful life. The most extensive review of this issue, undertaken by Engineering Data Management, Inc. demonstrated that in terms of both initial cost and the full life cycle cost, wood has an advantage. The savings of lower initial cost of wood compared to alternative materials overcomes the discounted present value of potentially higher maintenance, disposal and replacement costs for wood. In other words, the money saved by using wood today, invested at a modest return, will more than cover the costs associated with any disadvantage of wood, real or perceived, over the life of the power line. Averaging around 15% in 1997, the

cost advantage for wood is no doubt much larger now with the explosion in steel prices in recent years. The utility industry has conducted its own review of wood verses alternatives and concluded that "Treated Wood Poles are preferred by utilities because they are more practical, functional, and economically acceptable than other alternatives."

Conclusion

Despite intense promotion by alternative materials and developments in engineered products, the fact is undisputable that now and for years to come, treated wood remains the best all around product for most utility applications. It is raptor friendly, easy to install, naturally insulating, and has a long duty cycle. These factors make the treated wood pole a leader in safety, reliability, and efficiency. The key is understand the design and application of wood poles.

DID YOU KNOW?


Wood is one of the world's most environmentally friendly materials. Wood is renewable and recyclable, and continues to store carbon dioxide even as a finished product.

Each person uses wood and paper products equivalent to what can be produced from one 18-inch in diameter 100-foot tree every year. And each year the U.S. plants more than 5 new trees for each American.

Cedar Pole News is a publication of the Western Red Cedar Pole Association, which is solely responsible for its content.

The Western Red Cedar Pole Association can be reached at 800-410-1917, and at www.wrcpa.org.

**Check out our website--
www.wrcpa.org**

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