The differences between overhead and underground power lines

by Tom Tate

There are two methods of installing the power lines that carry electricity to your home, overhead and underground. NWEC members sometimes ask why we use one versus the other, or more to the point, why all power lines are not installed using the underground construction method. Isn’t one method better than the other? These are great questions, and the answer is that each method has its place. (86501001)

Overhead line construction starts with the setting of utility poles. Poles can be set in nearly any type of terrain, even rocky. In the case of heavy rock, special equipment is used to augur out the hole. If placement occurs in boggy or wet terrain, many techniques are available to set poles securely. Once the poles are in place, wires can be strung and then equipment—like transformers, fuses and reclosers—are installed. Power can now flow.

Underground line construction requires digging a trench that is deep enough to keep the lines well away from surface activities. Where the terrain is extremely rocky, underground lines may not be an option. Next, wires are laid in the trench directly or placed in conduits for protection. The trench is filled in, and the surface is restored to its original condition. Padmount transformers and additional equipment are installed as needed, now the system is ready to deliver electricity.

Let’s take a look at some the advantages and disadvantages of each construction method, beginning with overhead.

**Overhead construction**

**Pros:**
- Lower cost, quicker construction,
- Easier to spot damage and faults,
- Less expensive to repair and upgrade,
- Can be built in any terrain,
- Any voltage can be placed overhead.

**Cons:**
- Susceptible to wind, ice and snow;
- More vulnerable to damage from trees and vegetation, which requires right of way trimming;
- Vulnerable to blinks when animals and branches contact lines;
- Susceptible to damage from vehicle collisions;
- Less attractive.

**Underground construction**

**Pros:**
- Not vulnerable to damage from tree branches;
- Does not interfere with views;
- No right of way (tree trimming) required;
- Less susceptible to damage from vehicle collisions;
- Not impacted by wind, ice and snow;
- Less vulnerable to blinks when animals and branches contact lines.

**Cons:**
- More expensive to build;
- Susceptible to flooding;
- Difficult to locate faults;
- Expensive to repair;
- Fed by overhead lines at some point, making the lines vulnerable to outages and interruptions;
- Limitations on voltages that can be buried underground;
- Can be vulnerable to dig-ins.

Continued on page 3.
Free camp for children of NWEC members

Northwestern Electric’s Watts Up Kids Camp is a camp for 1st through 3rd graders which will be held at our main headquarters in Woodward on July 26. Camp hours are 8:30 a.m. until 11:30 a.m. The camp is free for the children of NWEC members. The three-hour session includes a variety of learning tools, games and activities to help kids learn about electricity, where it comes from and how to be safe around it.

To enroll your child, fill out the form and return it by July 11. For more details, call Jonna at 580.256.7425 or 800.375.7423. Space is limited (first 30 kids) so enroll today!

Watts Up Kids Camp
Thursday, July 26
(entry deadline July 11)

Student’s Name (Print) ________________________________
Age __________  Grade ____________  T-shirt size __________

Parent Name _________________________________________
Address _____________________________________________
City __________________________  State _________  Zip ______
Home Phone (_____) ______ - __________
Work Phone (_____) ______ - __________
Cell Phone (_____) ______ - __________

Please mail form to: Jonna Hensley
Northwestern Electric Cooperative
P.O. Box 2707, Woodward, OK 73802

Happy Fourth of July
Northwestern Electric will be closed on Wednesday, July 4.
For emergencies, call 877.966.7693.

April 2018 Operating Report

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damage from vehicle collisions; less attractive.

Underground construction

Pros:
- Not vulnerable to damage from tree branches; not impacted by wind, ice and snow; less susceptible to damage from vehicle collisions; no right of way trimming required; less vulnerable to blinks when animals and branches contact lines.

Cons:
- More expensive to build; susceptible to flooding; difficult to locate faults; expensive to repair; fed by overhead lines at some point, making the lines vulnerable to outages and interruptions; limitations on voltages that can be buried underground; can be vulnerable to dig-ins.

Determining if power lines should be overhead or underground boils down to what is best for the situation. Underground lines might be ideal in situations where there is a desire to keep the poles and wires out of sight, such as a residential neighborhood, park or historical area. There are many cities and towns that construct only underground lines for a variety of reasons.

Overhead systems work well when appearance is not a major concern. Examples include extremely long line distances across country, where the voltages are higher than the limitations set for underground lines.

The ultimate mix of underground and overhead construction used by NWEC provides you, our members, with the highest possible quality of service at the lowest possible price. Cost, appearance, reliability, maintenance and future upgrades will drive which is the better approach, overhead or underground.

Tom Tate writes on cooperative issues for the National Rural Electric Cooperative Association.

Hidden account number contest

Congratulations to Jeff Comstock for recognizing his number in last month’s issue. The other number belonged to Stephanie Bond.

We have hidden two account numbers somewhere in the articles in this newsletter. The numbers will always be enclosed in parentheses and will look similar to this example (XXXXXX).

If you recognize your account number, give us a call on or before the 8th of the current month and we’ll give you a credit on your bill for the amount stated. This month’s numbers are worth $25 each. Happy hunting!

The cost* to build one mile of single phase underground line versus one mile of overhead line is almost double.

One mile of single phase underground line.................. $78,000
One mile of single phase overhead line..................... $40,000

*Amount based on NWEC’s three-year average construction costs.

Shining Light on LED Savings

LED lights last up to 30 times longer than incandescents, reducing the need to replace bulbs in high or hard-to-reach places. Where can you use LEDs?

- Living Room Lamps
  Table or floor three-way lamps using LED bulbs provide 620, 1,600 or 2,150 lumens of soft white light and deliver up to 25,000 hours of light.

- Kitchen
  Dimmable recessed LED conversion lights add a warm glow of up to 1,200 lumens for kitchen workspaces and add far less heat. Each bulb could last 10 years.

- Bedrooms and Hallways
  Long-life LEDs are ideal for ceiling fixtures. A 9-watt LED produces the same 800 lumens of light as a 60-watt incandescent, and uses about 80 percent less energy.

- Bathrooms
  Omnidirectional LED globe bulbs provide a warm glow ideal for bathrooms. A 6-watt bulb produces 450 lumens and lasts up to 15,000 hours.

- Outdoors
  A 6-watt, 500 lumen LED bulb can replace a 40-watt incandescent bulb. The LEDs last up to 30,000 hours, so it could be a one-time switch.
Energy Camp provides exciting summer fun

Northwestern Electric sends five teens to annual event

What happens when you bring together almost 90 excited eighth-graders at a camp designed to teach them about electric cooperatives? You get a powerful good time at Youth Power Energy Camp.

The students come from all across the state and are chosen by their electric cooperatives to participate in the four-day fun-filled adventure at Canyon Camp just east of Hinton. The students representing Northwestern Electric at the 2018 camp were Cooper Cayot, Jackson Smith, Dalen Todd, Braden Williams and Katie Cole.

The five students submitted their winning essays about what they would miss the most without electricity and why back in March. After waiting two long months, they met early in the morning on the Tuesday after Memorial Day at Northwestern’s office in Woodward. Once they loaded their belongings in the Suburban, they were off to have some summer fun.

After they arrived, the campers got settled in their cabins and then gathered together to meet their new friends, hear a few rules and listen to a presentation about cooperatives.

After a break to enjoy a little bit of free time swimming, playing volleyball, basketball, crazy games and dinner, the campers gathered again to hear about the cooperative legacy and to form districts. The seven districts met individually to choose a symbol, flag, song and chant based on one of the seven cooperative principles assigned to each group.

The next couple of days were just as jam-packed as the first. Everyone got to try their hand at strapping on a set of lineman’s hooks and belt to try and climb a utility pole. They also watched a high-voltage demonstration and took bucket truck rides high up in the air.

The students had the opportunity to participate in a reality fair presented by WeOkie Credit Union. They selected jobs and made financial decisions based on their income. A few students’ eyes were opened when they discovered their income didn’t cover their expenses for the lifestyles they chose. (982222003)

Even more fun was in store for the young teens as they made the annual trek to Celebration Station for an afternoon of go-carts, arcade games, miniature golf, water bumper boats, and pizza. Back at camp, they held district meetings and elected board members (one from each group). Cooper’s district elected her to serve on the board. The final evening of camp ended with a pizza party and dance.

On the last morning, the campers wrote thank you notes, listened to a presentation by the Oklahoma Energy Trails linemen, and prepared to say goodbye to their new friends. After exchanging cell phone numbers, giving lots of hugs, and shedding a few tears, they each went their separate ways.

Cooper enjoyed getting to meet new people and having the opportunity to learn better leadership skills. Jack’s favorite events at camp were traveling to Celebration Station and racing against friends with go-karts. Dalen loved the camp and had lots of fun. He enjoyed playing volleyball and going to Celebration Station. Braden’s favorite part of camp was meeting new people he wouldn’t have met if he didn’t go to camp. Katie liked everything about the camp, but said her favorite things would have to be the new friends and memories she made.