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Windmill Erected The Old-Fashioned Way

Robert Peterson put up his 33-ft. tall windmill by hand with no crane or other lift needed.

"I brought the windmill home in pieces in the back of my pickup," he says. "I had a well company drill the well but, with the help of friends, I did the rest."

Peterson had attended a workshop on windmill technology that is held once a year at New Mexico State University in Las Cruces. He figured a windmill would be ideal for pumping water to his garden and fruit trees at his home in El Paso, Texas.

"We bought the tower from a local company, Burdick and Burdick, and the pump and pipe from American Windmills, a small company in California owned by Ellen Sattler," says Peterson. "She provided technical assistance by phone and guided me on the well."

After digging 4-ft. deep holes for corner posts, Peterson brought in friends and neighbors with wrenches and screwdrivers.

"My wife and I invited folks over for a windmill building party," he says. "We set all the parts out on the ground like a big erector set; however, it doesn't go together easily that way. It needs some muscle power to pull the holes together."

The common way to put up a windmill is to build it on the ground and then tip it or lift it into place using a crane. Peterson and friends started with the corner posts and set up the first level, complete with steps.

"We laid planks for a work floor across the top of the first section and built the next, moving the planks when we finished," he says.

As they got closer to the top, there was less room for helpers, and they still had to lift the 8-ft. (measured by the diameter of the circle of blades) mill into place.

"We rigged up a gin pole at the top of the tower, secured with chains and a pulley on one end," recalls Peterson. "We used a pickup truck to pull the mill up, while one person with a rope on the mill pulled it away from the tower as it rose into place."

Peterson then installed the tail after assembling it on the ground. Like the mill, it was lifted into place.

"The last thing was to add a very fine motor oil," says Peterson. "While it has to be changed every year, it's still a big improvement over having to grease the



gears."

Later on, when he needed to replace a part in the mill, he devised a lifting hoist patterned after one he had seen used for lifting ornamental windmills. He has since used it for pulling sucker rod.

"I built mine heavier and stronger," says Peterson. "It is a T-shaped steel post bracketed to the stub tower just above the top platform."

The post extends above the sails with pulleys on either end of the top bar. A cable runs from a winch attached to a concrete ground anchor through a pulley at one end and through a hole in the post to the second pulley and down to the mill.

"You need one person on the winch, one on the ground with a rope to guide it and one person on the tower," says Peterson. "It's easier than the gin pole, much neater and much safer."

Peterson admits that doing it the old-fashioned way by hand is slower and entailed more work, but had its own benefits. Not the least of which was painting it.

"We gave it its own logo based on the Philadelphia Phillies," says Peterson. "We sketched out a template by hand on cardboard and spray painted it on the tail."

Peterson also painted the sails and the 2000-gal. water tank erected near the windmill. The windmill looks like a giant sunflower and the tank like a Holstein cow.

The entire project ran about \$3,000. That included the mill, tower, 60 ft. of downhole pipe and storage tank. Drilling the well was extra.

The Petersons held a tank-raising party to put it in place. They built a rock wall box, and he and his sons hauled in sand to fill it. Partygoers set railroad ties in place and raised the tank on top of them, about 3 ft. above ground level.

"I wish I would have raised it higher for better pressure," he says. "However we have a nice steady flow through hundreds of feet of hose."

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Windmill Sales Booming, Says Aermotor Expert

New Mexico rancher Matt Williams knew at a young age that it takes more than cattle know-how to raise a profitable cow-calf herd. "Range cattle need a ready supply of water from a pond, spring, stream or well," says Williams. "Most of our livestock were watered by wells driven by windmills. When the windmills needing fixing, I was the one who did that, and I've been doing it since 1976."

Williams's company is a distributor of Aermotor Windmills and Windmill 702's. They also sell and service submersible pumps, provide water storage services to area ranchers, and build their own stock troughs and tractor tire troughs.

Williams says windmills have been used on farms and ranches for more than 125 years. Aermotor sold only 24 units in 1888, but by 1892 the company's one-acre factory turned out 20,000 windmills. By 1904, production efficiencies reduced the cost to \$25 for 8-ft. models and \$300 for 20-ft. models, which was 1/6th of their original price. In 2014, 8-ft. dia. models sold for just under \$3,000 and 16-ft. models sold for \$13,820. Towers range in height from 21-ft. models that sell for \$2,450 to 47-ft. models that cost \$9,070. Parts such as hand pumps, sucker rods, clamps, platforms and windmill oil for all models,

including those more than 100 years old, are still available and can be shipped anywhere in the world from the Aermotor company.

Williams says the most important element of a windmill is the motor, positioned at the top of tower. "The motor is a unique set of mechanical gears that convert the rotary motion of the fan wheel into the up and down motion of the sucker pipe. The motors are built basically the same way today as they were when the Aermotor company first started. They're so mechanically simple that the only maintenance needed is to change oil in them once a year."

If motors do malfunction, Williams Windmill can repair and rebuild a motor or provide replacement parts. "We work on all types of windmills and have been able to repair everything out there," Williams says. For producers interested in new equipment, Williams says his company offers 8 different models from 6 to 16 ft. in diameter. The size fan to use is determined by the diameter of a well, which can range from 1 7/8 in. to 6 in. Pumping capacity can range from about 125 to more than 1,800 gals. an hour.

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Industry representatives, consultants and returning students share tricks of the trade at this windmill school in New Mexico.

Windmill School Teaches Tricks Of The Trade

Carlos Rosencrans coordinates the Windmill Technology Certification Workshop at New Mexico State University (NMSU), but he's not the only teacher. Industry representatives, consultants and returning students share tricks of the "water lifting" trade, as well as a basic understanding of this old, but still valuable technology.

"It's the only one like this that I know of in the country, and we get students from all over," says Rosencrans, who normally teaches agricultural mechanics to ag education majors. "Our biggest clientele are crews of Native Americans working on reservations in Arizona and New Mexico. They may have several hundred windmills to maintain on a single reservation."

Other class members include ranch hands from New Mexico and surrounding states charged with keeping windmills operating. Some class members have started their own businesses working with windmills, while others have gone to small communities in Africa and South America to build windmills that provide the first fresh water there. Some are just interested in windmills and go on to install their own.

Some of those like Robert Preston (accompanying story) come back to share their experiences. Representatives of several sponsoring windmill companies, including Aermotor, take part as instructors and supply equipment for the class. Aermotor provides mills/motors for hands-on class work.

"We cover submersible pumps and solar powered pumps the afternoon of the first day," explains Rosencrans. "The next morning covers safety, including climbing terminology, how a windmill protects itself in high winds, and how leathers lift water versus pumping."

In the afternoon of the second day, the class goes into the shop to disassemble, repair and put motors back together. The following day is about work in the field.

"Fieldwork gives the class a realistic application of skills," says Rosencrans. "If we don't have enough to work on in the community, we have about 10 windmills on campus. However, since they don't get daily use, they don't always show wear."

Work on towers includes assembly and raising with a crane when available. Rosencrans says the class works mostly with 27 to 30-ft. towers and sucker rod in 20-ft. lengths.

The class has been offered yearly for more than 30 years. Maximum attendance is 25. A \$200 registration fee is charged to help cover tools and to pay for outside instructors. Rosencrans says their expertise is vital.

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