



Virgil Pook replaced the worn out door on his shop with a flat panel that has walk-through door and windows.



In the closed position, walk-through door and windows result in easier access and better lighting.

Big Shop Door Has Built-In Windows, Access Door

Replacing a worn out shop door with a flat panel raised by an electric hoist provided multiple benefits for Virgil Pook and his son Travis. With the flat panel lifted, they have a shaded work area outside the shop. In the closed position, they get easier access and better lighting because of the walk-through door and windows built into the big panel.

"In the past we had to walk to the other end of the shop for an exit door. It saves steps and the windows light up that end of the shop," says Pook.

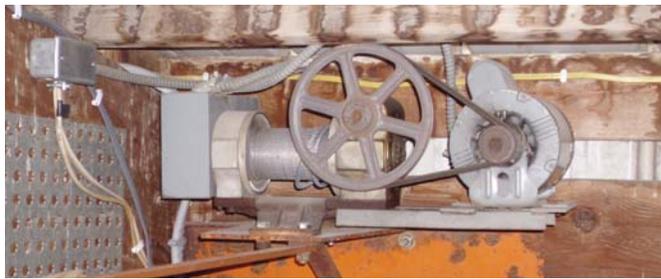
The Pooks kept costs and complications down with timing and design. They bought the electric hoist from a local school for only \$25. It had been used to lift basketball hoops out of the way in a gym. The frame for the 18-ft. wide, 12 1/2-ft. tall door was fabricated

at a local trailer maker out of 2 by 2-in. and 3 by 4-in. aluminum tubing. It cost only \$500. Nearly everything else was excess from other farm projects.

"We insulated it, sided it and installed the entry door and windows," says Pook. "We added a framework with gussets to the bottom of the door to reinforce it for lifting. Without that, the door would likely have started bulging."

Nine hinges hang the door to the old header. The winch was installed inside the shop with cables running to pulleys on two outside lift posts. From the posts, cables run to the sides of the shop door.

"The door doesn't lift real fast, but speed isn't a problem," says Pook. "It has an automatic shut-off at the opening and closing



Door is raised and lowered by an electric hoist that was originally used to lift basketball hoops out of the way inside a gym.

positions."

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Grain Bin Root Cellar Doubles As A Storage Shed

Travelers through Boulder, Utah often do a double take when they pass by what looks like a miniature grain bin at Scott and Brynn Brodie's Red House Farm. The shiny 18-ft. dia. corrugated steel bin with the trademark conical roof is only 12 ft. tall. It's decked out with sliding windows, a standard height white entrance door, and surrounded by nice landscaping. The casual observer doesn't know there's more than the eye can see: another 8 ft. of the bin is buried underground.

"I wanted an inexpensive building that would serve as a root cellar for our vegetable crops on the ground floor and be tall enough so we could build a second floor for storage, drying fruit and raising poultry," says Scott Brodie, who along with his wife Brynn, operates Red House Farm. "I figured that since a galvanized grain bin is just a giant culvert, it certainly should hold up if part of it was buried in my sandy soil," Brodie says.

The Brodies started the project by spending just \$400 on a dismantled 20-ft. tall bin after running a classified ad in the local paper. Scott learned on the internet that people had renovated bins for living quarters, but nothing turned up for burying a bin 8 ft. in the ground.

"I knew there would be side pressure on the wall from backfilling 8 ft. of sand, just like a basement wall or a retaining wall," Brodie says, "so I had to devise an internal support system." His design inspiration came from the hub and spokes of old steel wheels.

After Brodie excavated a hole about 9 ft. deep and 2 ft. larger around than the bin, he drew the circular outline of the bin wall in the bottom of the hole. He dug 8 postholes around the inside perimeter of the circle and one in the center. "The perimeter postholes are 7 ft. apart and about 3 ft. deep," Brodie says. "Each one is filled with concrete and a couple pieces of rebar sticking out the top to hold the support posts."

After assembling the bottom 8 ft. of the bin walls in the large hole, Brodie bolted 6 by 6 by 8-ft. tall support posts to the footings. He then attached floor joists and lateral braces from the top of each post to a 16-in. dia. hub log at the center. The 2 by 6 floorboards screwed to the joists tie the whole support structure together.

"The key to backfilling the hole without deforming the bin is to build the wooden post and beam structure before backfilling," Brodie says. "After backfilling we put down the 2 by 6 floor, then added the final courses and the roof."

"Cutting openings in the bin for windows and doors is okay if you don't overdo it and structurally alters the integrity of the bin," Brodie says.

"After cutting the openings, we built a wooden framework on the interior to regain the structural integrity lost by removing metal. A wood stove provides supplemental heat and cooking. Together the two floors provide more than 500 sq. ft. of usable space in the bin.

"For moisture protection we put two coats of membrane sealant on the outside of the buried walls and a vapor barrier on the ceiling," Brodie says. "With an insulated door and ventilation, it's ideal cold storage for potatoes, turnips, beets and canned products. This winter, when the outside air temperature was around 0, it was still 33 degrees in the cold storage."

Brodie used 5 extra sheets of corrugated side-wall steel to create an attractive and functional curved roof over the root cellar stairway. The post and beam roof structure also supports the 8-ft. stairway sidewalls. He added a row of glass blocks underneath both sides of the roof stringers, along with natural rock landscaping to finish off the project.

"I have to think that on a per-foot cost



Scott Brodie built this 2-floor combination root cellar-storage shed out of an 18-ft. dia. corrugated steel bin, installing a white entrance door on front.



He used corrugated side-wall steel to create a curved roof over root cellar stairway (left). Post and beam roof structure supports second floor.

basis, this bin creates much cheaper root cellar space than a conventional masonry structures," Brodie says. "We can easily regulate the temperature and humidity in the lower level with a fan, and in the upper level we can open windows, the roof and the door. The bin seems incredibly sturdy in high winds and I think it's going to last a very long time," he adds.

Brodie says the bin project cost him about \$1,000 out of pocket, plus labor. It's a great addition to the family's Red House Farm, a Community Supported Agriculture (CSA)

enterprise. Red House has 11 members who have purchased shares in the farm's food production, which includes vegetables, eggs and poultry. The business also supplies food for the local farmer's market, hosts community education workshops, houses a Community Toolshare Program, and hires interns who want to learn about food production.

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