

## Here's a cold storage house as good as our ancestors built

By Harry G. Nemeč

**B**ack in the early seventies, my wife and I decided to invest in our own ideas to “get ahead.” I was not earning enough money. We had tried second jobs, but that wasn’t cutting it either. We could exist and plod along, I could see that. It took every cent I was earning to pay our living expenses. That meant we would not have any savings. We needed a way to use our talents as an investment.

We decided to venture out into the woods of central Pennsylvania. We purchased a five-acre parcel of mountain land and a cabin, since we could afford it. The reason we could afford it was because there was no electricity, no running water, and no plumbing. An old cookstove was the source of heat and cooking. Water was available from a spring a short walk from the house.

The property was far enough away from the mainstream of life to be a cheap place to live. It was a desolate hunting area, and as such, a luxury for some people, an extra place to get away to at times. For us, it was an opportunity to have a place to get out of the rain until we could afford to fix it up for year-round living. We discussed the best way to capitalize on our investment. We could clear some land, grow our own food and sell the excess, raise chickens and sell eggs. We would make it into a five-acre farm.

During the first year, we obtained electricity, and with that, power to run the pump (which meant running water and inside plumbing) and automatic heat. We were becoming civilized. We had an acre of level woods cleared, and we planted a general crop. We were becoming a farm, and no farm is

complete without a place to store potatoes and root vegetables.

I was determined to make the hunting cabin and mountain ground into a five-acre farm. All I needed was a barn, a storage house, a tractor, and a patch.

With the completion of the inside plumbing and automatic heat, we could move on to the next projects. The second was the patch, which involved clearing land and planting crops. With our crops planted, we needed a storage facility so they would feed us all year and until the next crop came in.

After considerable study on the subject of food storage, moisture, ventilation, and rodents, I went on to look at the many types of construction. I chose to use what I had at hand—natural mountain field stone.

I was told that the stone found on the ground wasn’t good enough for the project because it had been weathered and wouldn’t hold the concrete. Since I had all that stone just lying around, it didn’t matter to me if they were right or wrong; I was going to do it my way. The way I figured it, since our ancestors built barns, houses, fence rows, and everything else using the stones that were lying around, I could too. Their buildings and fence rows are still around. Maybe the roofs have caved in and wood rotted away, leaving the shells of what were buildings years ago. I could use the same material they used and have a storage house for the cost of concrete and some sweat.

My mind was made up. I was going to use the stones that were all over the place. Next I had to figure how many stones I needed, but that meant I had to know how big this thing was going to be. How much of what was to be stored? Now the real thinking began. I

reverted back to the basics: What do we buy that we can grow? I studied our shopping habits: potatoes, carrots, beets, apples, yams, cabbage, onions, and the like. I could grow them and store them. I computed the mainstays and came up with 400 pounds of potatoes. (We usually used five pounds per week, and I added some to plant, and surplus). I then went to the store and looked at the pile of 20-pound bags, and measured the volume that made up 400 pounds. I figured that I could put 400 pounds of potatoes into a bin measuring two feet wide and five feet tall by three feet deep, or thirty cubic feet.

I measured in the same fashion for everything I was planning to store in the building. I then converted the total cubic feet into dimensions that would comprise the inside of the building. The result of my calculations showed that the cold storage house would have to be six feet by eight feet, with a six-foot ceiling, or 288 cubic feet. This measurement included walk-in space.

The next part of the project involved building materials. To determine how much stone I would need for this project, I used the same measuring technique as I had used to measure the space requirements for the contents of the cold storage house. I had to determine the thickness of the walls and make an allowance for the depth of the wall into the ground to the footer (or foundation), minus the space for the door. I had enough stone to start, and I would find more while digging.

I chose a portion of the land that had been used previously as a place to push unused ground while leveling for the house, since it faced the patch. I staked off the area, allowing for the thickness of the walls. Then I grabbed the pick, shovel, friendly digging iron, and gloves.

The initial day’s digging went fast, as I was digging from the side of a small depression into a steep rise. I did not need shoring, since the rise

was only six feet or so. I was able to throw the dirt right into the patch.

Because of the purpose of the building and the design of the walls (more than a foot thick), the footer had to be 24 inches wide and 6 inches thick, and it had to be down below the frost line (in our area, 34 inches).

The dirt floor acts like a chimney, permitting earth-temperature, moisture-laden air to flow into the cold storage building. It is this moisture-laden air that prevents the stored food from drying out or freezing.

The design calls for a ventilation pipe to provide an air passage for the ventilation of the moisture coming out of the ground through the dirt floor. If the footer isn't deep enough, frost will use the passage through the vent pipe, freezing everything in its path.

In a couple of weeks I had the footer dug, and a sizable pile of rocks that I'd found in the digging.

I mixed the concrete for the footer, using the same formula I had used for an earlier septic tank project (one part concrete, two parts sand, three parts stone), and reinforced it with scraps of re-bar, stones, and fence wire.

The stones were protruding out of the footer, ready to accept more stones that would make up the wall.

Since I was using concrete rather than mortar, I had to let each day's mixing set before I could continue. I was thankful for that.

I placed the stones vertically, in such a fashion that there was a space between them. I was building two walls with a small space between them. When that concrete hardened, I filled that space and put up more vertical stones, creating another space. Before I set each stone in place, I tried it several ways to get the most vertical coverage out of each stone. Then I wet the stone and set it into a "cushion" of concrete and propped it into place so the concrete could set.

Every day I would come home from work and mix up a batch of concrete and set some stones. Eventually, the ugly hole began to take the shape of a

crude building sticking out of the side of the rise in the ground.

I began in the corners, setting stone that would comprise the walls against the dirt sides of the hole first, since all I had to do was climb over the footer rather than go around the wall to work on the other wall. (I had figured that the raw stone would hold the concrete just as well a few months later as it would right that instant, just as long as I had used a wet concrete mixture and a dampened stone.) It got to the point that I was sorting rocks to find the perfect rock for the next placement. I then began to try breaking off some of the rock imperfections, rather than spending so much time finding the best fit.

Sorting a pile of football-sized rocks every time I needed another rock seemed like a waste of time, so I drafted my wife to assist. She sorted while I set the rocks. That lasted for a couple of hours; then I was sorting and setting the rocks by myself again. (I may have insulted her by discarding a rock that didn't fit where I had wanted it. She was better at sorting the laundry and stuff like that, anyway. I remember some words about where I could find more rocks that she didn't need to hand me.)

By that time, the structure was taking shape, and the walls were high enough that I could begin planning for the roof and ventilation pipe. The pipe hole had to be planned so that varmints couldn't gain access to the food that was going to be stored inside. I used a three-inch pipe and put a quarter-inch wire mesh screen inside the pipe to keep varmints out. The ground floor of the structure would provide a "warming" effect in the cold winter weather and circulate the natural moisture around the food that was stored. The vent pipe permitted this air flow. Failure to have air circulation permits fungus to grow and ruin the stored food.

Getting back to the roof construction: Once the vent pipe was positioned, I straddled the six-foot-apart

upright walls with 2x4s on edge about a foot apart and put a furring strip lengthwise in the middle (to pre-stress the poured roof). I covered that with half-inch plywood, tacking it on the edges to form a slight bow.

Since the 2x4s were on top of the walls, there were open gaps between them at the ends, between the top of the wall and the plywood roof. I filled in these gaps with concrete and small stones. I was now ready to work on the front wall, which would contain the door.

I measured the door frame using an old door I found out back. I made a 2x8 frame around the door and tacked it together so that it would remain square (or as square as the door, anyway) by nailing triangle pieces on all four corners.

I had left a roughed-out opening in the front wall, and I placed the 2x8 frame in the opening to be sure of the fit. Then I removed it and carefully drove 20-penny nails halfway into it from the outside, all the way around it, so that the heads would hold onto the concrete. The frame resembled a porcupine until it was set into place. This frame was first held in place by bracing, and then by filling in the voids in the stone wall with a concrete mixture between the stone wall and the nails. I then installed the doorstop trim on the inside of the frame, using a common furring strip.

The door I used was now going to fit into the 2x8 frame. Next, I had to frame it out to make it into a thick insulated door. I made a 2x4 frame on it, filled the openings in the frame with insulation, then put a piece of half-inch plywood on the open side of the frame. Before I fastened it all together, I put the door in place and tried to open it. I discovered the side that opened out needed a bevel to ensure a snug fit. I removed the screws holding the panel to the frame, made the bevel adjustment (hitting the opening-side 2x4 a couple of times with my hammer) and trimmed the

plywood after it was fastened. I put on strap hinges and rope for a handle.

With the door on and the plywood roof not yet completed, I had an opportunity to remeasure and determine if I needed more head room. I was pleased to find that my measurements had worked out perfectly.

The final stage in the completion of the cold storage building was to pour concrete onto the roof. I nailed some scrap lumber around the edges of the form to prevent the concrete mixture from running off. I gathered all the scrap metal I could find, including an old bed spring. I cut everything into appropriate sizes and laid it all in a checkerboard weave pattern in the roof form. I mixed a batch of concrete and poured it into the form over the metal pieces, which I had wet down pretty well. I then put a layer of wet rocks into the still-wet cement, pushing them as far down into the concrete as I could.

At the end of the week, I removed the form edges and examined the seal. I even hit it a couple of times with a hammer to check it out. It was "rock solid." Time to build the bins and shelves.

That year we filled the cold storage house and had pears until after Christmas, tomatoes until February, potatoes until March, and some to plant. We also had beets, carrots, turnips, and apples. We ate healthier from then until we left our farm. D