“Bubbles” Shelter Builders From Arctic-Like Weather

A redevelopment company operating in the North Country has found a way to keep construction activity going at a heated pace despite the subzero temperatures and winter weather in northern New York State.

Working under nylon “bubbles,” LUK, Inc., one of the first developers nationwide to be awarded a contract for off-base military housing under the Military Construction/Family Housing Act of 1984 (Section 801), has been able to maintain year-round construction despite the arctic-like conditions. The vinyl-coated, green and white bubble domes are scattered among seven construction sites throughout the Fort Drum area near Watertown, New York. Each bubble structure, which measures 120 feet by 155 feet by 45 feet high, allows the construction of a four-unit, two-story building with enough manageable space for the maneuvering of equipment, including cranes, bulldozers and concrete trucks.

The Army contract with LUK, Inc. calls for the construction of 1,000 housing units for soldiers assigned to the U.S. Army 10th Mountain Division at Fort Drum. The Military Construction Act, Section 801, enables the secretary of each military department to enter into contracts with private developers to build military housing or off-base housing and lease it back to the Army over a 20-year period. Several hundred units have already been completed and turned over to the Army for occupancy.

LUK, Inc., a company created by principals Salvador F. Leccese, president of LeCesse Bros. Contracting, Inc., a construction company in Rochester, N.Y.; Walter F. Uccellini, president of Walter Uccellini/United...
Group of Companies, a real estate development firm in Albany, N.Y.; and Garry Kearns, president of Garry Kearns Architect, PC, an architectural firm in Albany, N.Y., was organized to produce the largest contract of 801 Military Housing to date.

“To keep pace with the Army’s housing needs, drastic and imaginative measures had to be taken,” noted George Henninger, vice president of LeCesse Bros. Contracting, Inc., which introduced the “bubbles” to construction crews. “With construction crews expected to face wind chill factors sometimes at minus 70 degrees and incredible amounts of snow, something had to be done. I saw smaller bubble structures used on the Alaskan pipeline with much success and figured ‘why not try it here’.”

**Constant pressure . . .**

Because constant pressure is needed to keep the structures inflated, workers and machinery must enter and exit the “bubbles” through a system of airlocks. Propane burners heat the “bubble” to a constant 55 degrees under normal conditions, and even if the thermometer plummets to a bone-chilling minus 30 degrees, the interior is still relatively comfortable, Mr. Henninger says.

“We have six ‘bubbles’ which we move every seven days to different sites,” notes Mr. Henninger. “The 5,600-pound, 150-foot sail hovering over the construction site is firmly secured to the ground by 16 large anchors weighing two tons apiece.

**Climate-controlled environment . . .**

The dome shaped air structures provide a climate-controlled environment for year-round construction, says Mr. Henninger. Prior to this, “bubbles” were used mainly to cover recreation facilities such as tennis courts and ice rinks.

“People thought we were crazy to try to work under the severe winter weather conditions in this area,” he explains. “The frost level at times was more than 30 inches deep. But in order to meet Army requirements, we had to face harsh weather conditions to meet deadlines.”

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“Winds at 60 miles per hour provide nine tons of pressure on the anchors,” he adds. “But even if it came down, it’s not going to hurt you. The only thing that will hurt you is if you panic.”

Once a bubble structure is removed, the exposed building is completed from brick work to roofing, he says. Only interior work remains, which can be completed without the protection of a “bubble.”

“It takes an average of six to seven days to complete a unit under the ‘bubble’, “ says Mr. Henninger. “We have completed some as early as four days and some as long as ten. In four months we constructed 40 units including the installation of sewer and water lines and gas or electric hookups. We couldn’t produce these units at
the rate we are if it wasn’t for the ‘bubbles’.”

In addition to the bubble program, a panelization factory is used to enhance construction production. The framework of each four-unit building, including interior and exterior walls, window space and doorways, is produced inside the factory and then delivered to each of the seven sites for installation.

“The use of a panelization factory helps us meet the Army’s urgent housing needs and guarantees the soldiers a quality structure,” notes David Hartman, project manager. “Plus, there’s no loose lumber out on the job, no adverse conditions, no cutting and a lot more control and consistency in the product.”

“The panel factory also serves as a warehouse and distribution center,” says Wayne Blackmer, plant foreman. “We’re able to reduce our cost by buying all of our construction materials in bulk. This is especially important in the summer when production triples. We maintain colossal supplies and avoid middleman markups.”

Truck loads of wood are delivered to the panel factory where it is precut and assembled into framing components.

“The framing components for an entire building are stacked into huge piles waiting to be loaded into the panelling system,” according to Mr. Blackmer. “When we get a call from a construction site, all we need to know is the house number and building style and we’re ready to go.”

The panelling system consists of a four-station assembly line of workers which produce the framing, rough door and window openings, nailing, and finish plywood stapling.

“It takes about two hours each to build the interior and exterior walls for the downstairs of a four-unit structure,” notes Mr. Blackmer. “What’s more, we can produce the entire framing in only eight hours notice.”

“It’s like setting up a big jigsaw puzzle,” explains the plant foreman. “Six buildings are being worked on at all times. The whole process, from stockpiling to shipping, takes about 18 workers.”

“In the spring and summer when production is at its peak, we can construct two to three buildings a day in the panel factory,” says Mr. Hartman. “We can keep the factory running around the clock.”

The advantage of a plant operation and centralized inventory is consistency and high quality production, he adds. “The last unit is as good as the first.”

Year round employment . . .

While the “bubbles” and panelization factory help speed up construction and reduce cost, they are proving a benefit to the local economy. A larger number of area construction workers will stay on the job throughout the winter months due to the program.

“I would usually go to Florida in the winter to find a job,” says Ron Pearson of nearby Adano, N.Y. “But now these bubble structures allow construction workers to work all year long and around-the-clock. Now I don’t have to go south with my family every winter. As a matter of fact, my wife
and I decided to buy a house nearby.”

This is my first time working under a ‘bubble’,” says Rich Strate of Gouverneur, N.Y. “I think they’re great. They keep us dry and warm and give construction workers steady employment. It sure beats unemployment.”

LUK, Inc. has employed nearly 300 persons for the project with 98 percent being residents or subcontractors from the surrounding area.

“The military housing project has been challenging, particularly because of the potential problems due to weather,” says Walter Uccellini, president of Uccellini/United Group Companies. “We tried to control all the variables to produce the best product, but with the weather conditions we faced, we had to try new ideas and innovative methods, such as the ‘bubbles,’ to deliver the product. These ideas have worked well and have allowed us to be the first private developer to successfully construct off-based military housing for the Army under the 801 program. It’s been an exciting venture for us.”