



# The Perfect

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**F**or Jim Onan — owner of the building company Onan Enterprises — living in a “Golden Pyramid House” seemed natural. The idea began for him in the 1970s after reading a few articles from the University of Wisconsin. Seeing the positive results from their pyramid research project sparked Onan to start “playing with pyramids.” He built a few model pyramids that sat at home on a table, until finally his wife got sick of them filling up the house and threw them away. With that, Onan decided he’d build his very own 18,000 square-foot pyramid in Wadsworth, Illinois, moat included.

Finished in 1983, the five-story building was decorated to complement and support the pyramid’s Egyptian shape. The first floor contained a museum with artifacts; the second floor was built for function with a living room and kitchen; the third floor housed the bedrooms; the fourth floor offered a spare bedroom; and the top floor was designed as a lookout lounge.

Unfortunately, in the following 25 years the Onans experienced a few problems with their pyramid. First, they were forced to close their doors to tours because of the cost of security. Then, they tried to build a dome around the house to hide the building from people stopping on the side of the road to take pictures.

The motivation to call Premium Protective Coatings, Inc. (PPC), though, came when parts of the pyramid’s surface were damaged after a strong windstorm. When 60,000 lbs of steel from the “protective” dome fell onto the pyramid, the Onans knew they’d need a rehab and coatings upgrade.

BY STEPHANIE MARIE CHIZIK

## NO MOLTING IN THE MOAT

The surface of the pyramid and garage needed to be recoated, that was certain. Small areas needed to be removed and replaced and other areas needed new gold. How they would go about it, however, was up in the air.

Onan’s answer came from his son. When his son recommended Terry Crowder of PPC — an old work friend — for the job, Onan agreed. Crowder was given a chance to bid on the structure’s rehab, and was eventually entrusted with the project.

That trust would be put to the test soon after PPC’s first day on the job; unfortunately, the house was in worse shape than their four-man crew originally thought.

“When we showed up on the job the first day, we discovered that there was a lot of hidden damage on the building,” says Crowder. “There was a lot of rotten wood damage underneath the coating that was not detectable when we originally bid the job. We had to go in and renegotiate a little bit.” To make the new coating system work, they knew they’d need to replace all the areas of rotten plywood.

When they returned from renegotiations, the PPC team headed to tap (literally) into the problem. Two members of the team used hammers to tap the pyramid’s surface, searching for those damaged areas.

“We were banging on it like woodpeckers,” Crowder says. It took three hours on each of the four sides of the structure to get to every inch. At each damaged area, they used a Milwaukee Tool circular saw to cut out the old plywood and replace it with new.

PHOTOS COURTESY OF VFI, INC.

# Pyramid:

## A Wonder in the Coatings World



**ABOVE ▲** “When originally built, this house was covered in 18 karat gold plates,” Crowder says. “It had a coating underneath and the 18kt gold plates on top.” For 10 years, they’d had problems with a couple of windows leaking. And the windows were the house’s source for thermal shock. “When the sun shines down on the window glass, it’ll heat up about 150 degrees and drop about 40 or 50 degrees when the sun goes behind the clouds.”

“When we were stripping those sections of the building with the old coating, we had to be really careful with what we were doing so we didn’t get too much stuff floating around in the moat,” says Crowder. With 44 sheets of plywood needed to replace the damage, this proved to be a challenge, even more so because of the water-fowl- and fish-filled water.

“Possible contamination of the moat and the ill effects on the moat’s fish population were a concern,” explains Tom Holsen, Marketing Manager for Volatile Free, Inc. (VFI). Their products, used on this project, contain no volatile organic compounds. This quality of products and Crowder’s 10-year working relationship with the coatings company were why PPC recommended VFI for the job.

Since not every one of the damaged pieces of plywood needed a full four-by-eight foot sheet, removing and replacing the plywood without contaminating the moat was particularly problematic. They needed some two-by-two pieces and other four-by-four pieces, as well.

“It was just a lot of bits and pieces here and there,” Crowder says. “Wherever we found a spot where the coating was leaking — and some were as small as pinholes — we replaced it.”

The plywood pieces were prepped, precoated with the VFI-540 gray base coat that would be used on the rest of the house and the garage, and then caulked with Sonolastic TX1. The next step was to attack the main problem of the pyramid: the windows.

## A “SHOCKING” DISCOVERY

“When originally built, this house was covered in 18 karat gold plates,” Crowder says. “It had a coating underneath and the 18kt gold plates on top.” For 10 years, they’d had problems with a couple of windows leaking. And the windows were the house’s source for thermal shock.



**ABOVE ▲** Because the sides of the pyramid-shaped building taper in at the top at a 45-degree angle, anything above shoulder-height was reached with a man lift. The PPC team worked two Haulotte lifts with two sprayers in each basket. “The shape of the building caused a challenge in moving the ‘man lift’ in a smooth and efficient manner in order to facilitate proper spraying of the coatings,” explains Holsen.

“When the sun shines down on the window glass, it’ll heat up about 150 degrees and drop about 40 or 50 degrees when the sun goes behind the clouds,” Crowder clarifies. “That’s what creates havoc in our industry.” Resealing the windows, then, was a crucial step in the pyramid rehab.

This three-to-four-week-long step was “the hardest part of the whole project,” he continues. “It was labor intense!” Because the original sealant was directly laminated onto the glass, it became a challenge to get it off the 60 plate-glass windows. Their solution: a saw, chisel, and hammer to knock the sealant off the glass. It’s a lot of delicate work for one coatings crew, but they managed to break only one of the 60 windows in the whole process!

With the windows cleaned and repaired, Crowder’s crew was able to install the new urethane seal. They used about 15 cases of caulking to create a bevel at a 45 degree angle off the glass. With the hard part out of the way, the crew could move onto the coatings. The pyramid shape of the building, they learned, would cause quite a problem for them.

## GEOMETRY PROBLEM

Because the sides of the pyramid-shaped building taper in at the top at a 45-degree angle, anything above shoulder-height needed to be reached using a man lift. To cover more ground at once, the PPC team worked two Haulotte lifts with two sprayers in each basket. To run the machines, they used a Cummins Onan (unrelated to Jim) three-phase generator and a MMD Airman 185 air compressor. The plan was set. The execution, however, was a bit more difficult than it looked on paper.

“The shape of the building caused a challenge in moving the ‘man lift’ in a smooth and efficient manner in order to facilitate proper

# JOB AT A GLANCE

## PROJECT:

Re-coating the Gold Pyramid House in northern Illinois with a custom-made volatile-free gold coating

## COATINGS CONTRACTOR:

Premium Protective Coatings, Inc.  
43360 Willow Hollow Lane  
Winthrop Harbor, IL 60096  
(847) 693-6931  
www.premiumprotectivecoating.com

with:

Volatile Free, Inc. (VFI)  
19500 Janacek Court  
Brookfield, WI 53045  
(800) 307-9218  
www.volatilefree.com

## SIZE OF CONTRACTOR:

A 4-person crew worked this project

## PRIME CLIENT:

The owner of Onan Enterprises and his family

## SUBSTRATE:

New and old plywood

## SUBSTRATE CONDITION:

Previously-coated, damaged

## SIZE:

18,000 sq. ft.

## DURATION:

3.5 months

## UNUSUAL FACTORS:

- Due to damage under the original coating, the bid needed to be renegotiated
- Volatile-free coatings chosen due to the proximity to the surrounding moat
- Pyramid shape caused shifts in wind direction and difficulty with 45-degree angle
- Work stopped at 3 p.m. each day to allow the coating to dry before dew formed on the house

## MATERIALS/PROCESS:

- Replaced damaged plywood substrate with pre-coated 2' by 2' and 4' by 4' plywood pieces
- Power-washed structure with a mild detergent using a Landa and MI-T-M 3004 3,000 psi
- Spray-applied VFI-1007 primer at 1-2 mils
- Spray-applied VFI-540 basecoat at 30 mils
- Spray-applied VFI-277 gold topcoat at 20 mils
- Spray-applied VFI-2575 clear coat at 6 mils

## SAFETY CONSIDERATIONS:

- Wore DBI-SALA (Capital Safety) and MSA/Rose Pullover harnesses 100% of the time, double-checked each morning
- Wore 3M full-face mask respirators, safety glasses, and Tyvek suits



**ABOVE ▲** When working in the lifts, all four men wore DBI-SALA and Rose Pullover harnesses 100% of the time. Before scaling the pyramid each morning, they first inspected their safety gear to ensure everything was correctly fastened and properly clipped onto the lifts.

spraying of the coatings,” explains Holsen. With only a 25-foot-wide piece of concrete-covered land between the pyramid and the moat, reaching the top of the outer four walls proved very difficult.

To ensure the safest job site, all four men in the lifts wore DBI-SALA and Rose Pullover harnesses 100 percent of the time. They double-checked their harnesses each morning to ensure everything was hooked up correctly and clipped onto the lifts.

To prepare the freshly repaired pyramid walls for the new coatings, PPC power-washed the whole structure with a mild detergent. It took the crew six days to clean the surface with two 3,000 psi power-washers, from Landa and Mi-T-M. Again, the crew paid particular attention to the environmental effects of the particles coming off the roofline.

“I didn’t want to use too much chemical because of the water being around there,” explains Crowder. “I didn’t want to wash all that stuff into the moat.”

When the crew started spraying the coatings, the moat would become a bigger issue. High winds blowing off Lake Michigan made contamination a real concern. The only thing the crew could do was stop work for bits of time until the wind died down.

“Wind was a big problem because of the way the wind swirls around the building,” Crowder says. “At 20 feet off the ground the wind would be blowing one way and up 20 feet higher the wind would change the other way.” These quick changes in airflow pattern made it hard for the crew to apply the coating evenly. All coating precedents went out the newly-sealed windows.

“I’ve never worked on anything so hard in all my life!” Crowder exclaims. “Even when doing water tanks the wind direction stays constant with you; but being on the pyramid like that, the wind direction changed one way to the other.” The wind added to the angle of the pyramid meant this job, just north of the

# VENDOR TEAM

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www.basf.com

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www.mitm.com

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www.mmdequipment.com

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www.glascraft.com

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www.purdycorp.com

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Pittsburgh, PA 15230  
(800) 672-2222  
www.msanet.com

## VOLATILE FREE, INC. (VFI)

### *Coatings*

19500 Janacek Court  
Brookfield, WI 53045  
(800) 307-9218  
www.volatilefree.com



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“Windy City,” was a tricky one. Lucky for Crowder's PPC team, they quickly overcame the steep learning curve and figured out how to work with the angle of the wind. At 70-feet up in the air, they didn't have much of a choice!

## WORKING THROUGH THE DEW

Wearing 3M full-face mask respirators, safety glasses, and Tyvek suits, the crew was ready for the coatings. The plan was to spray-apply the transparent black primer, follow with a gray base coat, then a custom-tinted gold topcoat, and finish with a clear coat. The crew, though, hit one more hurdle.

They started with a flash coat of VFI-1007 primer. In four hours, they applied a one-to-two mil pass using a Graco airless spray pump with a 415 tip.

“The primer went quickly,” Crowder says. “I wish it all went that quickly.” Unfortunately, when the team came back in to spray-apply the VFI-540 basecoat, they were forced to bend a bit with their timing.

“One side a day was what we were trying to get done, but there was other detail work that we had to do.” This included applying a different primer — VFI-2760 glass primer — directly to the windows. This primer — applied in a two-mil thickness on top of the urethane caulking — acted as a second seal. In Crowder's eyes, this second seal was the most important one.

“The urethane caulk was just a backup; the coating adhered right to the glass, becoming the main seal.” With the windows properly coated, the PPC crew taped off all 60 plate-glass windows and all doors with Langeman's wire-trimmed tape.

When they returned to spraying the basecoat, they used a Glascraft MXII and Graco Foam Cat 400. They used a Probler gun with a 02 tip to achieve 30 mils. It took the crew six days total to apply the basecoat and a few minutes for it to dry to the touch.

The next day, after allowing 18 hours for the basecoat to fully



**ABOVE ▲** The crew first spray-applied a flash coat of VFI-1007 primer in a 1- to 2-mil pass using a Graco airless spray pump with a 415 tip. Then they applied a different primer — VFI-2760 glass primer — directly to the windows. This primer — applied in a 2-mil thickness on top of the urethane caulking — acted as a second seal. This was followed by a spray-applied 30-mil basecoat of VFI-540 and another layer of the VFI-1007 primer. The second primer was specified to ensure a good bond between the basecoat and topcoat. This was followed by the golden 20-mil topcoat of VFI-277 and a 6-mil, roller-applied clear coat of VFI-2575.

cure, the crew applied another layer of the VFI-1007 primer. This second primer was sprayed to ensure a good bond between the basecoat and topcoat. The crew learned quickly that the topcoat would need some tweaking.

“Originally, I had real gold on the house,” explains Onan. “I had the gold coating; for the rehab I had to have something new and more protective.” To find a stand-in for the original 18-karat gold finish, Volatile Free custom-made a finish that would be as close to real gold as was possible without being the actual element.

They came up with VFI-277, which the PCC crew spray-applied at 20 mils with the same equipment they used for the basecoat. It took the crew six days to apply the gold topcoat, a few minutes to dry to the touch, and 18 hours for a full cure.

Then, to finish the pyramid, the crew topped it off with six mils of the VFI-2575 clear coat. They roller-applied the clear coat on with a half-inch Purdy nap roller. The clear coating was used to extend the life and enhance the shine of the gold topcoat. The crew learned that it would also help bird droppings wash off with rainwater as well as help get snow to slide off the building.

“That [snow] is a big problem with that structure,” Crowder explains. “That’s what rips the seals off the windows. It’s like an avalanche. VFI-2575 helps the sides be slicker and helps everything slide off.” It took the crew four days to roll the clear coat onto the entire pyramid and garage. However, the clear topcoat took about eight hours to cure fully, but about an hour for it to dry to the touch. This meant that the crew needed to finish each day by 3 p.m. If they took any longer than that, the coating wouldn’t be dry before the dew set in.

The house’s close proximity to Lake Michigan guarantees that each morning, thick dew hangs around the Pyramid House longer than in other locations. Because of the many hours it took for the clear coating to cure, the dew put pressure on the crew’s

timing. The dew was not as much of an issue with the fast-curing coatings; the crew was able to apply these coatings and not have to worry about cure timing. The dew, though, still restricted the workday to six hours.

The combination of slow curing topcoat and heavy morning dew provided the crew with a tight six-hour work window in which they had a lot to accomplish. Once the topcoat completely cured, however, the crew pulled the Langeman’s wire tape from the windows and doors. This removed excess coating while maintaining a tight, clean seal around the windows.

“And now the snow slides off and it stays nice and clean,” Crowder says. “He [Onan] didn’t think it would work. He was hoping I was right.”

## A PERFECT PYRAMID

After 33 years, two coating systems, and a failed dome, Jim Onan’s Pyramid House is back to new. In the next few years, the Onans may have their sphinxes and other statues coated in the same process, but for now, getting their home and garage recoated was enough.

“The leaks that used to occur when it rained no longer occur,” Holsen says. After working for three-and-a-half months with the Pyramid House’s various elements — water, wind, and gold — “the building is now sealed against the elements better than it has ever been.” And the gold is shining better than ever, too. **CP**



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