

CENEX VCL

Location: Valley City, North Dakota

Building Series: Arch™

Building Size: 62' x 100'

Application: Fertilizer Storage



Cover-All Provides Urea Storage Solution

When Gary Wieck began working for Cenex Vcl as the Ag Product Manager, the Valley City facility was supplying approximately 1500 tons of crop nutrients to the Barnes County area. In 2002, the projected crop nutrients are expected to exceed 8000 tons.

Most of their 2 million dollars of crop nutrients is custom applied to more than 40,000 acres by their two Lor Al custom applicator units. "Having the supply to meet the demand requires solid planning and execution. Over the years, the window for application has decreased," says Wieck. "When it comes to handling large shipments of urea and providing custom application services, timing and planning is everything."

Urea is a nitrogen source shipped in high volumes and requires a large, well-ventilated, dry storage space. Cenex Vcl was using five different locations to store their urea shipments, the need to expand their storage space had become a high priority. "When you're handling 4000 tons of urea, there are only one or two opportunities a year to purchase product. We are solely dependent on truck transport. Handling and finding enough suitable storage space was creating major stress for our employees as well as our trucking alliance," says Wieck. "The logistics of moving that much product in and out of five different locations and having trucks available when you need them was a continual challenge."

The solution seemed simple - construct a suitable storage facility and eliminate the cost of continual handling and waste. "We looked at everything - wood structures, concrete structures, steel structures. What proved to be the major challenge was hanging a conveyor system and maintenance / safety catwalk from the building truss, some building suppliers wouldn't even quote on the project," says Wieck. "The load numbers for the conveyor and catwalk system with a full load were 200 lbs. per square foot. All of the design plans presented were either not practical from a financial point of view, or not possible without installing support posts in the middle of the building. We wanted a clear-span floor area so the custom application equipment with their 60 and 90 foot wide booms could be stored inside the building when empty."

Kevin Johnson of Gateway Building Systems presented their building solution; a 62' by 100' Cover-All® Arch™ building. Unlike steel, wood and concrete buildings, where the walls are constructed to support a roof truss system, the Cover-All building technology is a roof truss system from the ground up. By designing the appropriate concrete wall foundation and decreasing the base span widths of the steel trusses to five foot on center, the Cover-All® was able to meet the wind and snow loads as well as safely support the conveyor and catwalk.

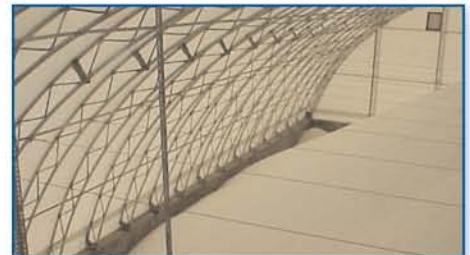
A ground core study showed that excavation had to be done to eliminate six feet of inadequate loose soil. Once a firm clay base was established, a plastic moisture barrier was put down to prevent moisture migrating through the cement into the building. An eight-inch thick concrete slab was poured to create the 62 by 100 foot floor. The 10-foot high, 12-inch thick concrete walls were constructed with a heavy re-enforcement of rebar to meet the engineered horizontal loads for the walls. The 21 trusses of the Cover-All® Arch™ building were positioned on top of the wall, five foot on center.

"These buildings are ideal for fertilizer storage," says Johnson. "Fertilizer doesn't affect the polyethylene fabric and the galvanized steel tubing has an added coating for corrosion protection."

"We now have a suitable facility to store a large amount of product," says Wieck. "The urea looks as good coming out as it did when it went in. There is no sweating or bonding of product and the floor isn't slippery. The high ceiling and ventilation system keeps the quality of the urea consistent and has eliminated any ammonia odor. The building is cool in the summer and allows natural light. The additional benefit is that we can store our custom application units in the building when the building is empty. We are extremely pleased with the investment."



The 62' x 100' Cover-All® Arch™ building was placed on a 10' high concrete wall.



The 12" thick concrete walls were engineered and constructed to meet heavy horizontal loads.



The 21 arch trusses were placed 5' on centre to support catwalk and conveyor system and to meet wind and snow loads.



Full load numbers for the 12" conveyor and catwalk system were 200 lbs. per square foot.



Cage fire escapes were added to both ends of the building for maintenance access and to meet Federal safety regulations.

Building & Installation Highlights

- A plastic moisture barrier was put down to prevent moisture migrating through the cement into the building
- The 10-foot high, 12-inch thick concrete walls were constructed with a heavy re-enforcement of rebar to meet the engineered horizontal loads for the walls
- Base spacing for the 21 steel truss frames was 5 foot on center