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## CASE STUDY

# HANGAR COMPLEX FALCON FIELD AIRPORT





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As a leader in innovation, Nucor Building Systems works continuously to develop products that are some of the most versatile, energy-efficient and cost-effective building solutions on the market today. We work closely with our customers to gain a deeper understanding of their needs then develop new solutions or improve existing ones that provide them with high-performance, competitive products. From our flexible custom-engineered building solutions, to our insulated metal panels with cool coating technology, our products allow our customers to increase efficiency and qualify for LEED® points.

As an industry leader, our strength, capacity and resources offer unprecedented value to our customers. Our integrated infrastructure allows us direct access to an uninterrupted supply of steel and the ability to provide our customers with single source solutions for a wide range of products.



“We wouldn’t dare go into any project like this with anyone other than Nucor, because we know we have people that are going to back us and take care of issues as they may come up.”



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Nucor Building Systems prides itself on metal building system solutions that are built on relationships and personal involvement from day one — saving costs, solving design issues, and providing conflict resolution prior to the erection of a structure. From game-changing design technology to unique jobsite staging tools, Nucor positively impacts the way our Builders interact with their projects, from start to finish.

Authorized Builder Arizona Corporate Builders of Tempe, Arizona, recently completed phase II of a six-building and 35-door project, located at the Falcon Field Airport for the City of Mesa, AZ — raising the level of the city airport’s clientele. The total project encompasses approximately 300,000 square feet of space, with each phase including three structures and about half of the square-footage. Multiple buildings in the project include mezzanines requested by the owner due to the benefit of extra square-footage. The buildings are high-end hangars capable of holding large planes and jets, which are leased out by the airport to corporations.

“Nucor Building Systems and Arizona Corporate Builders came into the project from the very beginning,” said Greg St. Clair, President of Arizona Corporate Builders. “We both joined the design team, working with the client and architects. At the pre-construction level, we gave input for the framing characteristics and the economies of the project. It’s a perfect example of saving cost, close to \$1 million to the owner from the very beginning.”



Success of early teamwork was clear with step one of designing a hangar — the door. “The door drives the structure,” said St. Clair. “We were involved with the door selection, considering implications that each door can have to the structure, all equating to dollars and time. Nucor and district sales manager Joe Mellody were very integral in helping provide the architect and owner direction — a big part of the money savings early on.”

Incorporating a high-end feel with a pre-engineered metal building was important to the owner. The team achieved this by partnering with the architect and incorporating design suggestions by NBS and Arizona Corporate Builders. Nucor incorporated design elements such as steps in the parapet and reliefs in the walls by varying the girt depths rather than using custom framing. This provided an economical solution without sacrificing the architectural flair desired by the owner.

Blending the recesses within the flat wall spaces also offered unique accent lighting elements. The exterior design incorporated an L-shaped metal building system highlighted with a decorative radius of conventional steel, masonry and glass. Besides the flush and bypass girts breaking up the wall planes, different panel textures throughout the project added to the high-end feel of the structure. A combination of Nucor wall panels — the Nucor Reverse R-Panel, the HE40 Heavy Embossed Insulated Metal Wall Panel, and the DM40 Double Mesa Insulated Metal Wall Panel — all

added to the unique exterior cladding. The DM40 panel acts as an underlying layer for a masonry veneer wainscot.

Insulated metal wall panels added to the overall energy efficiency of these structures’ value. “The hangars are basically cooler rooms, with low-energy use air-conditioning,” said St. Clair. “They wanted their high-end clientele to be able to pull their jet into the hangar and then get into their vehicles without breaking a sweat.” The project is not 100 percent insulated metal panel. The Nucor team advised on utilizing single skin panel and insulated panel based on the side of the building — air-side versus road-side. Again, making economical decisions without compromising design.

“Another unique feature is a jack beam design,” said Mellody. “The original design of the building called for very wide gable buildings with the hangar doors in the end walls. We converted the buildings to single slope structures with a jack beam going across the high side, including the doors, which lowered the entire structure.”

A metal building system was chosen for this project because of the versatility of clear spans and the structural framing needed for these hangars. With the large jack beams framing the large hangar doors, metal building systems also offered superior economic benefits. “If this project would have been built conventionally and/or out of masonry or concrete, the cost probably would have been double,” said St. Clair.



Using metal in the multiple wall panels provided a versatile design and the ability to hold up in the extreme climate of Arizona.

Assisting in the project's success were the many capabilities offered by Nucor, such as BIM modeling, Tekla drawings, and the jobsite staging app, ShakeoutPro. Knowing about potential conflicts in the concept and drawing stages were key to taking care of issues prior to manufacturing and erection.

Nucor's use of 3D Building Information Modeling (BIM) technology allowed all those involved a detailed, three-dimensional conceptual replica of the structure, seeing the project as it will be prior to construction. "BIM was extremely valuable," explained St. Clair. "When you have fire protection, trades putting their piping in, and things like the doors fitting, there are a lot of pieces and parts. We were able to give to the architect the Nucor Tekla drawings, and they married those into their BIM modeling and did conflict resolution – all before even fabricating steel, that's huge! A handful of potential issues were caught early, saving major time and costs."

With acres of steel on the jobsite, use of the staging app ShakeoutPro maximized efficiency and enabled the Arizona Corporate Builders team to unload and stage parts directly off the truck. The app was beneficial during construction of pods on the ground and the erection of those when lifted into place with a crane. The ShakeoutPro app highlighted parts and

pieces involved in a certain pick and knowing the pounds of steel that the crane would need to lift was an important part of the pick process.

"We had a great management team that were onsite almost full-time," said St. Clair. "They were a technically astute team, using the ShakeoutPro app on their tablets and phones. Other people on the jobsite would turn to our guys and ask them questions, because we were equipped with these tools – on the jobsite and not having to run back to the office to a computer! They were the resource to turn to when there were issues and to get an opinion."

As a long-time Authorized Builder, St. Clair explained why they partnered with Nucor for this expansive project: "Nucor can handle our larger projects. They have the customer service and the team to handle this kind of intricate, high-complex project. Nucor designated an individual on the customer service side to handle the project, and he was instrumental in coordinating. We wouldn't dare go into any project like this with anyone other than Nucor, because we know we have people that are going to back us and take care of issues as they may come up."

The success of phase I and II, has garnered a future third phase. "When I think about this whole overall job, it was the perfect example of a design-build, the use of pre-engineered metal buildings, and the relationships between manufacturer, builder, erector, and design team, and getting in at the right time – a perfect example of how it should go," said St. Clair.



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