

THE POSSIBILITIES OF POST FRAME

Ohio DOT project helps move style beyond pole barns

Municipal projects offer many opportunities for contractors who have the patience for the challenge. But for post-frame builders, the potential opportunities may not even be offered due to a lack of understanding of modern post frame. Indeed, as post frame continues to grow and mature, the challenge of educating consumers to its many new possibilities remain.

A recent success heralds from one of the stronghold states of post frame: Ohio.

In this recent development, the Ohio Department of Transportation has selected post frame for six of its newest equipment and storage buildings after a delegation from the National Frame Building Association was able to have its case heard before ODOT officials. Presently, three buildings are

completed, and the remaining three are in various stages of the bidding or pre-building process.

When dealing with municipalities, such as ODOT, nothing comes fast or easy. In this case, it started about three years ago when Steve Eversole, owner of Eversole Builders, Lancaster, Ohio, recognized an un-met opportunity. His company had been building for ODOT since the 1990s but they were basically salt storage buildings and the standard 40 x 80 foot structures. “We were having some success with that part but they weren’t using [post frame] for the bigger structures. And I kept telling them: ‘hey, we can do more than just machinery storage buildings.’”

One of the good things about post frame is its relative affordability, so

when the economy tanked in 2008, the affordable factor soon caught ODOT’s attention. They were primed with information from the National Frame Building Association and its Post Frame Marketing Initiative, followed in 2010 with a 2-hour workshop on modern post-frame design presented by Harvey Manbeck, an agricultural engineer at Penn State (now a professor emeritus) who spent a good share of his career in post-frame research.

Eversole describes Manbeck as a modern day “post-frame guru.”

“They started making post frame in the 1940s, and they had their leaders, but a lot of the modern methods translates back to Harvey,” Eversole says.

“Harvey came into Columbus and presented to the ODOT facilities peo-



A 115-foot span truck storage building, shown here during construction was the first post-frame building finished in the ODOT project. It is located near Columbus. Photo courtesy of Jerome M. Scott Architects and Miller Watson Architects.

ple, emphasizing that the engineering that went into post frame was sound and top-of-the-line, that we weren't just for the outback building anymore," Eversole continues. "And they were very impressed with Harvey ... Harvey was really the star in all of this. They looked at him and were very appreciative of his knowledge."

Manbeck could tell by the questions he received that part of the problem in the past was the use of design professionals who were not familiar with post frame. "They were not incorporating diaphragm design, they were not incorporating the latest techniques, so they were over-designing, like using large knee braces where they were not needed, and consequently they were not competitive buildings," he says.

"I think another issue was properly designing and attaching sheathing to the roof and walls so you could create diaphragm action which essentially assures that the significant portion of the design lateral loads are carried through the roof diaphragm and shear walls."

Manbeck went into the presentation with certain goals in mind. "I wanted to identify those structural features that were unique to post frame, particularly the nature of the sidewall columns, the isolated, shallow post foundation system, the incorporation of the shear strength of the 26- or 29-gauge rib steel sheeting that is typically used in post frame, the fact that knee braces are not required in post-frame buildings in which you have diaphragm action, plus, the code compliance of post frame construction,

that post frame is a sustainable building system, and its cost efficiency."

The ODOT officials were receptive but conservative. Manbeck understood their cautious acceptance.

"When you deal with change, when you're dealing with public money, and dealing with liability — professionally and otherwise — until they become a little more familiar with it and have a couple more projects under their belts, it's difficult to be a little less conservative. I've been there before, and it takes guts to take that full step," he notes.

ODOT was looking to build new outpost facilities in four locations in the state: Wooster, Steubenville, Forest and North Lima. "Each county has an outpost," Eversole explains. "A lot of these facilities were built 50 to 70 years



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This cold storage building stands at a new Ohio DOT outpost facility at Wooster. General Contractor: Jeffrey Carr Construction Inc., Massillon, Ohio; Post-frame subcontractor: Stanley Miller Construction, East Sparta, Ohio; Steel siding and roofing supplied by Fabral. Photo courtesy of Jerome M. Scott Architects and Miller Watson Architects

ago. One: they are outdated; two: equipment is bigger; and three: they are no longer on the edge of town, so they've been moving them out more on the edge of town, closer to the highways ODOT takes care of and more suited to the equipment they use to take care of the highways.

"And they decided, from a cost standpoint, [post frame] might be a more adaptive way to go," Eversole says.

To create a more efficient and complete design, however, post-frame engineers were needed.

Manbeck was again called upon when the bidding process had narrowed down to a handful of architectural company finalists. "My only involvement was to define some of the technical questions this panel could ask of these potential bidders and the kinds of questions were linked to evaluating their understanding of the post-frame design system," Manbeck recalls. "From that point on I was just an observer, but a very pleased observer, because if these go well, which I think they will, if they come to fruition, go well and perform well, I think they can serve as a model to be adopted by similar organizations in other states. I see no reason why not."

Brent Leatherman, senior project manager and design engineer at Timber Tech Engineering Inc. was asked to join

an architectural and engineering team for one of the bidders. It resulted in the first completed building, a heated truck storage building near Columbus.

Originally, the bid was for a more conventional 96-foot clearspan, but the project began to change as the winning bidder and the customer sat down to finalize the project.

"Our first design for this truck storage building had a span of 96 feet, that was our first submittal," Leatherman says.

The state had already saved money by going with post frame, so there was some wiggle room in its budget for size and they ultimately decided on a 115-foot clear span width.

Leatherman admits that one of the biggest pluses for post-frame over steel — cost effectiveness — was pushed to its limits with the larger design, but unwavering was his confidence in the stability of the structure. "We were comfortable with the bigger design as well, but we just felt the 96-foot span had a little bit more efficiency with it and a cost savings over a steel span," Leatherman explains.

Going wider meant working closely with the truss designer to create an effective, efficient design. "The truss design is perfected by the truss designer, however, we want to make sure that it is doable for that truss designer, that he can come

up with a design that works,” Leatherman says. “So instead of posts 6-foot on center, we brought them in to 5-foot on center. And we suggested a double truss.”

In addition to size, another concession to the customer was the use of a continuous concrete wall around the foundation. “We suggested they could realize more cost benefit of post frame if they would remove that continuous wall foundation and let us do a traditional post-frame foundation and then use some other barricade inside,” he explains. “They just felt that if someone ran into the wall with a dump truck or payloader, this would be a little more resilient than the wood posts extended all the way down ... they thought it was worth the investment to protect that bottom wall.”

The truck storage building also realizes the post-frame benefits of increased insulation capabilities.

“The insulated capabilities of the 8-inch wall cavity is a critical feature of post frame and we had a ceiling attached to the bottom chord of the trusses where we could insulate above that ceiling line as well.”

Inside, post frame provides clean lines and usable space. “When you have an interior liner on the walls and a ceiling installed on the bottom of the roof truss, you have full use of all the interior space. You don’t have any steel frames jutting inside and taking away from clearances,” Leatherman explains.

The overall dimensions of the truck building are 115-feet wide x 176-feet long x 20-feet high.

For access, there is a 20-foot overhead equipment door in each end, and a few miscellaneous man doors. In winter, trucks coming in from a snowstorm have a place to dry off, get serviced and be prepared for the next storm.

Also on the site is a new cold storage building, an unheated structure that measures 44 feet wide x 180 feet long x 14 feet high.

The Stuebenville location will have similar buildings.

The Forest location is scheduled to have one 48 x 168 x 16-foot post frame for vehicle storage and a wash bay; and the North Lima location is set to have a 90 x 108 x 18-foot post frame for truck maintenance and office space.

None of the new outpost buildings are in Eversole’s territory so he chose not to bid on any of them, but that doesn’t make him any less happy about the outcome. He says of the buildings: “They’re well designed and make for a good looking outpost and hopefully in the future the light of post frame will shine even brighter. Hopefully, as other commercial entities sees what can be done with post frame they will say: if it’s good enough for the government, why, certainly I can use that.”

Manbeck agrees. “Change is a stepwise function in many, many cases, so maybe we’ve taken a small step.”

The education process, however, must continue. He concludes: “You’re kidding yourself if we don’t think we don’t have to be on the front line, expanding our message to a wider and wider audience and also refining and enhancing our message to those who have taken that first step.”

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