

Walking the Walk

STREET SMARTS AND CAREFUL PLANNING CONTRIBUTE TO SUCCESSFUL PEDESTRIAN WALKWAYS



A 150-foot-long span for the Cole-Estes Pedestrian Walkway is lifted off the Goldhofer transports by a 900-ton crane, ready for installation.
PHOTO COURTESY OF IDEAL CONTRACTING

BY STEVEN H. MILLER

The first riddle you ever heard, very likely, was about a chicken crossing the road. Traffic's incompatibility with pedestrians has led to the invention of traffic cops, stop signs, traffic lights and various other methods of temporarily halting the road. But in cases

where the traffic can't be stopped, there are ways around it, either below or above. Pedestrian tunnels under roadways have been common for decades, and increasingly, walkways have been built overhead.

These walkways and bridges for bipeds present interesting challenges in construc-

tion. A roadway — whose traffic flow is too important to be paused by a stoplight — is usually fairly wide, calling for a long span to bridge it. To minimize the amount of time the road must be shut down for construction, the spans are often pre-assembled nearby and then lifted into position during

The big crane arrived and was assembled on a Thursday on a crane mat between the retention pond and the road. "It was a sitting area, grass and sidewalk, with a couple of trees," Torres says, "so we took out the trees, moved the bench and built it up to achieve a solid stable surface." From that position, the crane could hoist the truss off the Goldhofer, turn it 90 degrees horizontally over the north two lanes of the roadway and swing it out over the retention pond into place.

The move and lifts began Saturday morning, and, thanks to extensive planning, were completed Sunday night. The crane was disassembled Monday and the road opened on Tuesday.

In order to work on the span over the pond — installing architectural panels, etc. — Ideal anchored 10 10x40x5' barges in the water, to serve as a working platform. They were able to put scissors-lifts on the barges to work under and alongside the span. The crews had to wear life vests while working over water.

"It was a different approach but definitely efficient for the timeline challenge we were presented with," comments Torres.

UNDER ONE ROOF

Not far away, in Pontiac, Michigan, Ideal Contracting again teamed with ruby + associates to build the longest overhead pedestrian walkway in the United States, 1,000-foot long, including two big spans over roadways stretching 105 feet and 177 feet, respectively. The walkway connects two buildings that form the headquarters of lending giant United Wholesale Mortgage (formerly United Shore Mortgage). The company bought a 900,000-sq-ft expansion-building across the road from its 600,000-sq-ft-headquarters in Pontiac. To help foster the feeling that the 7,000 employees work under the same roof, they built the connector. It features six moving walkways to help speed passage between the two buildings.

At 27 feet wide and 15 feet high, the connector is generously sized, and it is fully enclosed to make it useful in all weather. (Pontiac averages 35 inches of snow an-

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nually.) Much of its length consists of short spans supported by steel columns supported on concrete piers, "stick built" as Spencer Young, project manager, Ideal Contracting, puts it.

It was the two long spans that made the project exciting. "With any of these bridges over active roadways," explains Jeff Gasparrat, senior project manager with ruby + associates, who worked on logistics of construction. "It's mostly coordination and timing."

The location was easier to work in than the GM project. There was a place next to the road where they could build the 105-foot span, and then lift it by crane and swing it into position. For the larger, 177-foot span, they had to build farther away and transport the completed assembly down the road.

"One thing we tried to do was to walk the site early in the project to see if there were any obstructions logistically," says Young. "We found that there were light poles that were going to be in the way, and the original gates they wanted to provide for our access were not going to be wide enough for getting the loads in and out. We had to make sure the grade from the road up to our assembly area was not too severe, and we had to supply that grade to Ericksons [an AGC of Michigan member] who operated the Goldhofer transport of the larger truss, so they could make their

calculations. We also had to work on where they were going to set up the crane. The back end of the crane has a swing, too, so when you're swinging to pick the truss up, is your back end going to hit any trees or light poles or electrical equipment? Actually, there was a light pole that was in the way and we had to take it down."

ruby + associates engineered an assembly jig with "goalposts" on either side, that allowed truss segments to be unloaded in pairs. "We would try to unload two at a time," says Young, "so when you load it into the jig, you could lash it to the goalposts, and then put in the intermediate members that tie the two trusses together at the roof level and the floor level. Then we move on to the next pair."

"What was tricky," he says, "was that the 177-foot span had a camber in it. We had to shim it to set the camber to the pre-erection number, so that when the concrete was poured and all the siding and the glass and the conveyor were installed, it would settle into its correct final state. It was tricky, because you're dealing with iron, and iron likes to do its own thing in depending on temperature."

The completed box truss was lifted onto and transported via Goldhofer to its final location. ruby + associates designed the rigging and lifting lugs so that the box truss could be lifted into place by a 900-ton Liebherr LTM 1750 crane. The road was closed for the entire weekend. The lift only took about two hours, but assembling the crane took eight.

"What made this job a lot of fun," Young believes, "is that all the work happened before the work. We were planning this for three to four months before these trusses even got to site. And we had to coordinate all of that with our crane supplier, with Erickson who was supplying the Goldhofer, with ruby + associates, and with the fabricator. Each person needed all the same information, but each was supplying something a little different. There were a lot of emails back and forth, with everybody chiming in on how we think it should go. It was really a truly collaborative effort."



The United Wholesale Mortgage Connector, at 1,000 feet, is the longest enclosed pedestrian walkway in the United States.
PHOTO COURTESY OF IDEAL CONTRACTING

a brief closure. Long spans require a big space to assemble, and that space is not always close to the installation location, so they need to be moved on the ground and require a very big crane (or two) to lift them into final position. These jobs require careful planning and often innovative thinking.

A MEETING OF THE MINDS

The Cole Engineering Center Tower and the Estes Engineering Center at General Motors' Technical Center in Warren, Michigan are two buildings that stand about a football field apart. GM wanted the people who work in these two buildings to be able to collaborate freely. Standing in the way of that goal were four lanes of traffic and a small body of water.

The company decided to create a pedestrian walkway between the two buildings to bridge over the road and the retention pond to help facilitate in-person meetings (pre-COVID). Ruby + Associates, an AGC of Michigan member, provided engineering design as well as engineering assistance for the construction processes. Ideal Contracting, also an AGC of Michigan member, built the structure.

It had to fit between two existing buildings with very tight tolerances. Both the roadway and the area bordering the retention pond — a grassy spot with sidewalks, where employees often eat lunch — had to remain open for use during construction. The staging site assigned for constructing the spans was a parking lot, much of which was still in use for cars, making construction access a tricky matter of coordination. The fully assembled spans had to be — somehow — moved over land to put them within crane-distance of the final location. And, of course, the schedule was short. As Ideal's Senior Project Manager Jennifer Torres puts it, "It was a great challenge."

Design began on July 19, 2019, and finished September 6. "We're trying to fit a structure in between two existing buildings," explains Ben Miller, PE, SE, project manager, Ruby + Associates, "so having very accurate survey data between those two buildings is key."

The spans — 150 feet and 151 feet, respectively — are steel box trusses, almost 12 feet wide and 15-1/2 feet high. They are fully enclosed against the bitter Michigan winter but feature windows along much of the

length to avoid a claustrophobic feel. There was a small patch of ground between the road and the retention pond that allowed for a narrow steel column bent support between the two spans.

The plan was to assemble the structural steel and lift it into place, pour the walkway deck and add the roof, architectural cladding panels and windows.

Assembly involved two cranes (250-ton and 350-ton) and just finding space to assemble the cranes was a challenge. "We had to work with our customer to maintain constant traffic flow to, and from, and within the parking lot," Torres explains, "and it was full. Cars were parked right up against our fences. Steel deliveries were a challenge." Nonetheless, Torres relates, erection of the two box trusses "was pretty straightforward, for the most part."

Getting the box trusses to the jobsite was performed by Goldhofer, large, remote-controlled, multi-wheeled transport platforms. The trusses were walked up the road with the Goldhofer remote-control operator wearing the console around his neck and a team of ironworkers and engineers walking alongside it. "I'd never seen anything like that," Torres exclaims.