



Camp Mabry's Training and Innovation Center is the first 3D-printed structure to receive a historical building permit from the Texas Historical Commission.

Camp Mabry opens 3D-printed innovation center

Total construction time: 3 months

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Over the course of about three months, about 50 U.S. military service members and three operators created the 3D-printed Texas Military Department Training and Innovation Center, which was unveiled at Camp Mabry on Friday

morning.

The roughly 2,600-square-foot structure was created through a small business innovation research grant, which the department used to partner with Icon, an Austin-based construction technologies company.

The center will be used for individual

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Brian Stevens, the Texas Military Department's director of plans, programs and innovation, speaks at the opening of Camp Mabry's 3D-printed center Friday.
PHOTOS BY RICARDO B. BRAZZIELL/AMERICAN-STATESMAN

Camp Mabry

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and collective training, hosting conferences and external engagements, and serving as a celebratory space for the base. The center has an open floor plan with a reconfigurable classroom and training space, storage rooms, a conference room, and two patio spaces, one of which has a view of the historical military base in its background.

“In a time of constrained resources in the military, it’s difficult to get money to build things,” said Brian Stevens, the Texas Military Department’s director of plans, programs and innovation. “(We were) able to put together a very collaborative and complex team that would help us build this facility, which will be used to continue to allow our soldiers and airmen to train for their missions, prepare (and) deploy, but it will also be a place that we can do outreach and partnership.”

While the total construction time was about three months, the actual printing time was only four weeks. Icon Chief Operating Officer Graeme Waitzkin said the process is usually shorter, but Icon and the department wanted to train and collaborate with service members, which extended the construction time.

3D-printed buildings can be more cost-effective and can be built more quickly and sustainably than traditional wood and drywall buildings, Waitzkin added.

Stevens said he expects the center to last at least a hundred years, if not more, because it is not susceptible to damage from water, fire and bugs in the same way traditional buildings can be.

“We were able to invest funds and partner with the civil program to help accelerate the technology by giving Icon a real project ... to continue to accelerate the development of their technology,” Stevens said. “And in the future, I’m certain it will absolutely be faster, more cost-effective, and we know right now it deliv-



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ers a more efficient, stronger building that will last longer than traditional trades.”

An Icon spokesperson said Friday that the company is doing resiliency and regulation testing to continue innovating and thinking of how these structures could be used on bases and possibly in combat zones.

“When we need to have structures constructed in more dangerous environments and combat areas,” Stevens said, “then this technology could potentially be used autonomously, where we don’t have to put soldiers in or airmen at risk.”

The center, Stevens said, boasts a series of firsts for both the Texas Military Department and Icon.

It’s the first large-scale side-by-side 3D-printed structure at Camp Mabry, the first structure built by Icon using two printers simultaneously during construction, and the first 3D-printed structure in the market to integrate coloring into the walls rather than using paint or other coloring methods.

Additionally, it is the first 3D-printed structure recognized by the Texas His-

torical Commission with a permit. To achieve this designation and receive permission for the building, the Texas Military Department collaborated with the commission to ensure the center reflected the historical district of Camp Mabry, with the coloring matching the worn brick colors of the surrounding buildings.

The building also features an interior chevron statement wall that was created with Icon’s first integration of parametric patterning into the veneer bead of the wall system. The chevron pattern represents those worn by U.S. military service members to designate their rank.

Stevens said that Icon “was able to design that feature as an ode to our soldiers and airmen past and present, who will continue to serve in this building, and it will stand for hopefully 100 years.”

Waitzkin said Icon hopes its partnership with the Texas Military Department can continue to educate service members about 3D printing and how to operate the machines, potentially allowing military departments to use these printers for temporary and permanent structures in the future.

“We really feel like Icon’s technology can help troops be more self-sufficient and have more capabilities, as far as building buildings on military installations,” Waitzkin said.

Future of 3D-printed buildings

The printers use structural concrete instead of the plastic used in small-scale 3D printers or the tissue used in medical 3D printers.

Icon had previously partnered with the Texas Military Department, building 3D-printed barracks at Camp Swift. Icon has also prototyped a U.S. Marine Corps vehicle hide structure at Camp Pendleton in California.

Outside of its defense work, Icon is working on commercial real estate buildings in Texas and even thinking about “off-world construction,” meaning making preparations for buildings on other planets.

Icon is working alongside NASA to research and develop construction systems capable of building structures on the moon and beyond. The company is also printing rocket launch pads.

Icon is helping build the world’s first 3D-printed hotel in Texas. The firm is also finishing the world’s largest 3D-printed community in the Georgetown neighborhood of Wolf Ranch.

3D-printed structures have grown increasingly popular in recent years due to their speed and relatively low-cost construction.

Icon’s Vulcan printer is nearly 50 feet wide, is more than 15 feet high and weighs nearly 5 tons, much different from the everyday 3D printers most people are familiar with in schools, in libraries or at work, Waitzkin said.

“Where all of our minds go when we hear 3D-printed construction is a little plastic toy that we have on our desk or that you find in a school. So we’re using a lot of those same ideas but at a much larger scale,” Waitzkin said. “A real key differentiation is the materials that we’re working with and the structural system that we’ve developed.”