

Secure Wall Mounting System for Large Glass Panels Now Seismically Rated

CaptiveHook® - McGrory’s patented, glazier-vetted, and engineer-approved system - is now AAMA 501.6 compliant.

By Nicole Rollender

THE SCENE: Sun blazing in a 107-degree desert. What looks like a Hollywood movie set in Fresno, CA, with building façades lining a mock street. “It’s like walking into a Clint Eastwood Western with that telltale whistle,” says Jim Gulnick, McGrory Glass’ lead engineer and vice president of operations. “This ‘set’ is where we tested CaptiveHook®, our revolutionary glass-mounting system, in extreme environmental and weather conditions.”

On that hot day in July 2018, Pat McCormick, who manages projects and engineered products at McGrory, looked up at 1,200 pounds of glass towering 20 feet above him. Next to him, Gulnick gave a Poseidon-like order, and the earth shook.

McCormick and Gulnick had trekked from McGrory’s Paulsboro, NJ-based headquarters to subject half a ton of 9/16-inch thick, mirror-backed, laminated glass to some of Mother Nature’s worst—a massive earthquake. Would the glass stay on the wall, unbroken, during the seismic event?

Gulnick and an expert team, which included principal Phil Khalil of engineering firm Eckersley O’Callaghan & Partners, worked on the seismic testing project since the conception of CaptiveHook®. “CaptiveHook®’s the only large-format, glass-mounting system that’s seismic compliant,” Gulnick says. “This definitely isn’t your father’s Z-clip.”

McGrory had recognized the need for an engineer-approved system. “Glaziers glued glass to walls using suspectly secured Z-clips, or adhered it to wood or aluminum honeycomb with screwed clips, leaving the materials open to humidity changes, chemical incompatibility, or improper adhesion,” Gulnick says. “We devised a system to keep glass on walls and removed considerable risk, allowing architects to enjoy true freedom of expression.”

While West Coast architects long focused on seismic safety, East Coasters have learned that earthquakes, tornadoes, and hurricanes can happen anywhere. “Architects expect testing of exterior elements like façades, curtain walls, and windows, while wall systems inside these buildings typically aren’t stability-tested for extreme conditions—or can even meet those requirements,” Gulnick says. “An interior glass-mounting system like CaptiveHook® just wasn’t available. It wasn’t seismically prudent to mount glass on your wall: Compliance wasn’t guaranteed.”

THE BIG SHAKE-UP

Back at the Fresno testing site, a 50-horsepower hydraulic pump swung the glass back and forth in intervals of mere seconds, not stopping for six minutes. The incessant movement of the American Architectural Manufacturers Association (AAMA) test simulated increasingly severe earthquakes. “You don’t know what to expect—we’re watching the glass move left to right at the bottom, first a half-inch, then an inch, up to six inches,” Gulnick says. “You’re waiting for that crack.”

Fifteen screws held each 4-foot-by-10-foot, 300-pound glass panel in place, a setup that took the test crew 15 minutes to install. How could such an efficient system withstand earth-shaking conditions? “When the test ended, we said, ‘Is that it?’” Gulnick says. “Everything—glass and mounting system—stayed on the wall intact. It was amazing.”

After the successful test, CaptiveHook® became the only multi-panel, large-format, glass wall mounting system to earn the distinction of being rated AAMA



McGrory Project Manager Pat McCormick looks up at 1,200 pounds of glass towering 20 feet above him.

501.6 compliant. “We have a high level of confidence in the performance of CaptiveHook® as a system that meets all architectural and structural constraints,” Khalil says. “Achieving a system to accommodate some of the highest seismic loads and inelastic seismic movements in the world using innovative hidden seismic restraint mechanisms is unmatched with current glass-cladding systems. The AAMA certification definitively confirms CaptiveHook®’s performance.”

The single-sourced system allows glaziers to safely and quickly mount glass panels up to and beyond +85 square feet / +500 pounds. CaptiveHook®

PHOTO: © JIM GULNICK, 2019 | MCGRORY GLASS

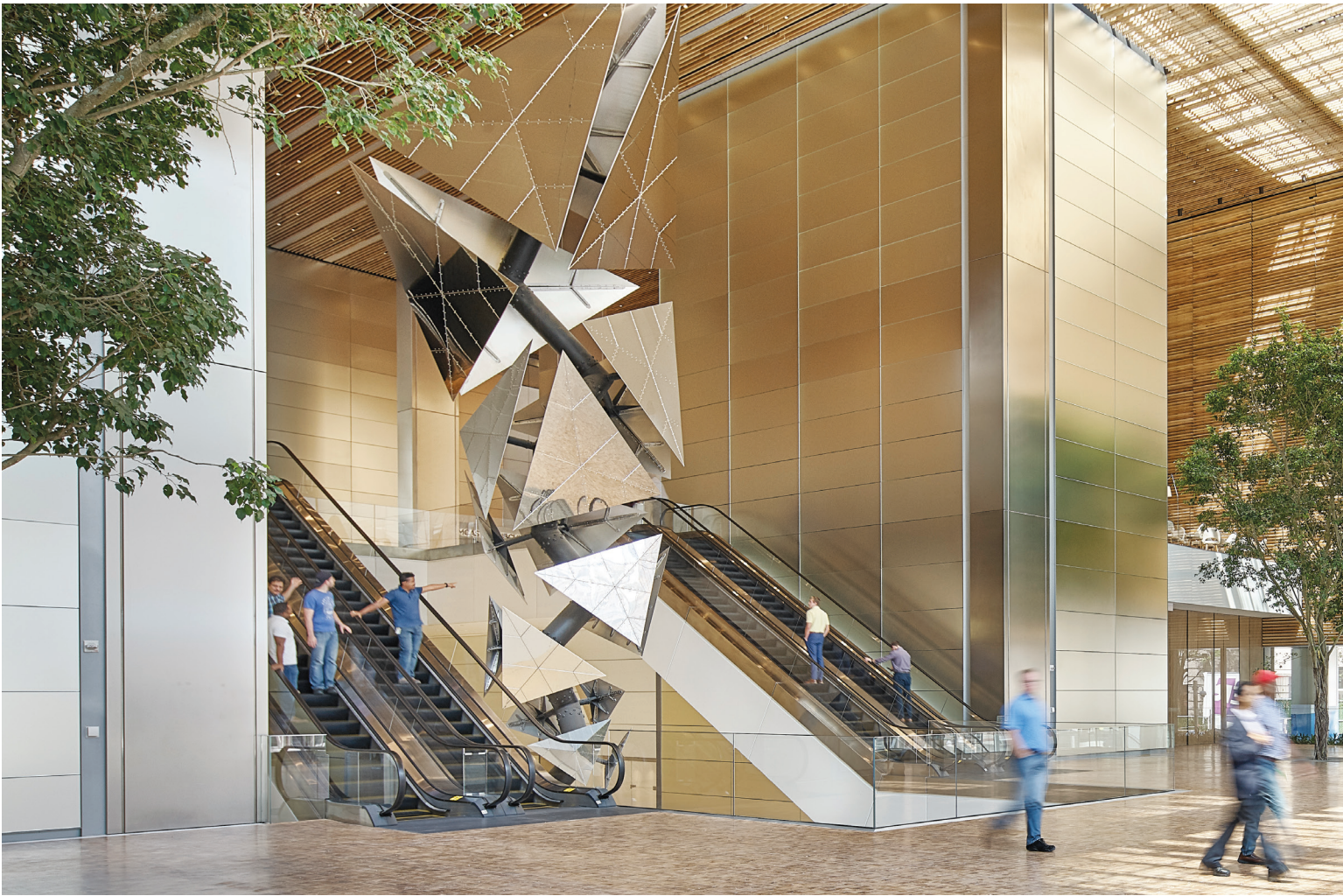


PHOTO: © JEFFREY TOTARO, 2019 | JEFFREYTOTARO.COM

Multi-story CaptiveHook® base build project in Philadelphia, PA, featuring over 50,000 square feet of glass wall cladding.

precisely aligns glass and wall mounts within plus or minus five thousandths-of-an-inch (+/- 0.005”) tolerance. “CaptiveHook® offers design freedom, and the security of working with a field-tested, Eckersley O’Callaghan-approved system,” Gulnick says.

THE BIG NEED

Gulnick posits that you can’t compare existing mounting systems to CaptiveHook®. “Calling this system a French cleat is like calling a Tesla a horse,” he quips. “A Z-clip is a non-patentable French cleat, where CaptiveHook® holds large-format glass in a patented, fully framed, invisible engineered system that meets all structural requirements, and can be made seismic compliant.”

Previously, installing glass was laborious, time-consuming and simply unsafe: Manufacturers shipped glass to glaziers who frequently adhered the panels to wood offsite, or directly to the wall onsite. Glaziers either had to wait for materials to cure before transporting to the building site, or hold the glass in place against the wall with framing until everything was dry.

“Wood swells and shrinks with weather conditions, at different expansion rates, so glass could work its way off or become misaligned,” Gulnick says. “The CaptiveHook® system isn’t impacted by changes in the environment, due to our proprietary combination of in-house fabrication and materials.”

Infinitely modular, CaptiveHook® also facilitates easier maintenance because glaziers can remove and replace individual panels. “With traditional mounting systems, there’s little ability to readjust and reinstall glass panels without removing other panels or parts,” Gulnick says. “Now, you can remove any piece of glass safely at any time, for any reason, and replace without disturbing your installation.”

THE BIRTH OF CAPTIVEHOOK®

When McGrory’s team worked on a Philadelphia building project (think: 500-pound glass panels mounted on 13-story walls), the owner wanted a company to provide both the glass and a secure mounting system. “If you work with a glass manufacturer and a glazier using a separate mounting system and something goes wrong, who’s left holding the bag?” Gulnick says. “The building owner and architect for choosing the system.”

McGrory aimed to be that single-source provider. “We had worked with metal-and-rivet systems, but to handle more than 50,000 square feet of glass, we took it up a few notches,” says Gulnick, who then collaborated with Eckersley O’Callaghan’s engineering team and the project’s glazier, Eureka Metal & Glass Services, Inc.

“Developing the CaptiveHook® system took place over an extensive period of iterations between the McGrory fabrication and installation team and our engineering team, with detailed Finite Element Analysis to verify and optimize system and component performance,” Khalil says. “Through this continual refinement, the end result is a deceptively simple system that conceals its advanced engineering, and solves the conundrum of glass cladding with no visible means of support, even in high-seismic zones with significant building movement.”

Visit captivehook.com to learn more or email captivehook@mcgrory.com.

