

# MUSEUM OF ARTS AND DESIGN

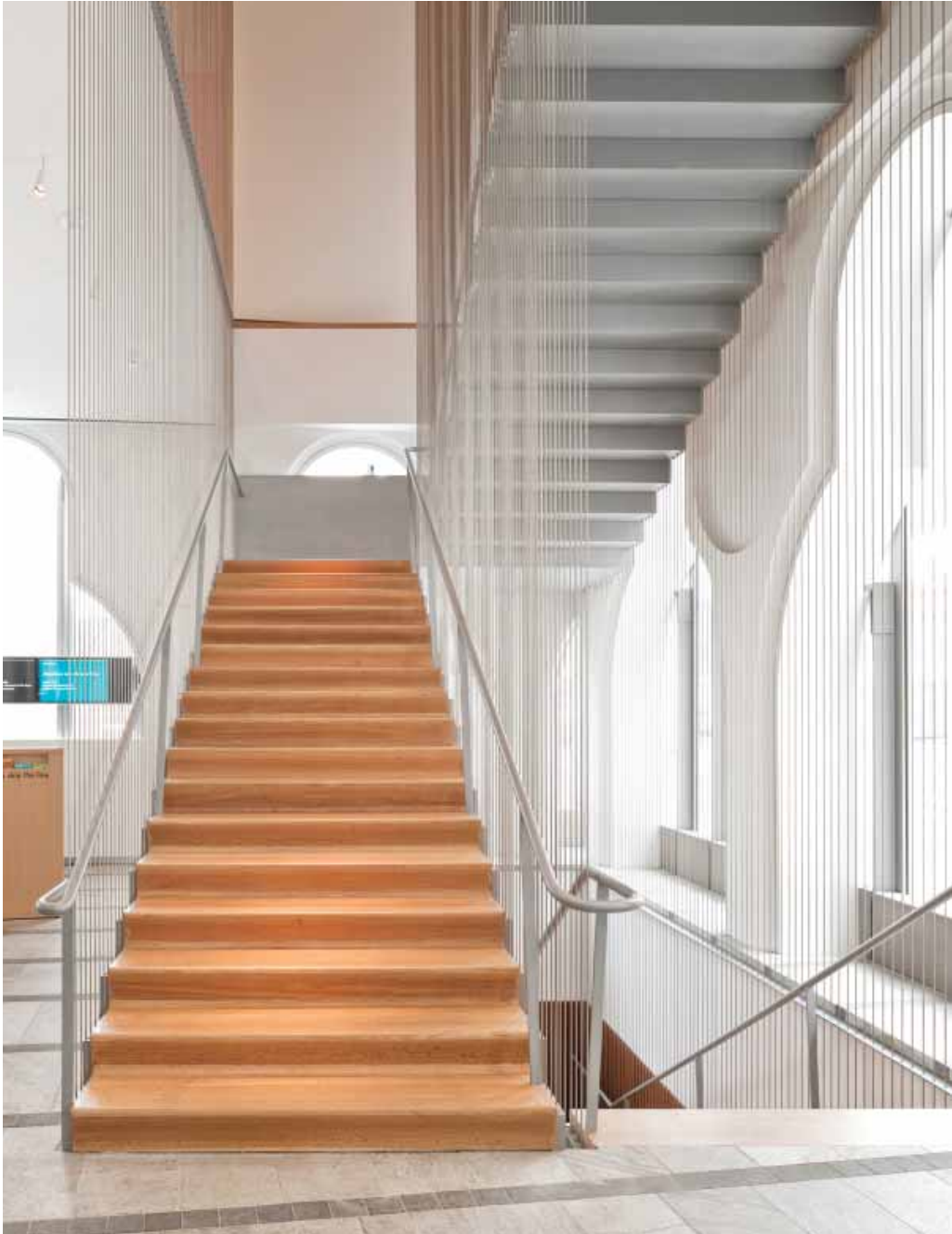
Mad World

**The new Museum of Arts & Design (MAD),** a reinvention of Edward Durrell Stone's modernist palazzo 2 Columbus Circle by Brad Cloepfil of Allied Works Architecture (AWA), touched off an impassioned preservationist debate by radically altering the original facade. But even those squeamish about the new light-admitting exterior agree that changes to the interior—notably the museum lobby's new ornamental entrance stair—were sorely needed to correct functional shortcomings that long plagued the original design.

Isolated on a minuscule island of prime Manhattan real estate, MAD contains a mere 4,500 square feet at street level—not much for a museum lobby intended to host 500,000 visitors annually. Such a small footprint became especially problematic with MAD needing to squeeze in a retail store and loading dock at ground level as well. Both client and architect determined that an elegant stair, while space taking, was vital to the project. "There was a desire to allow people to move up from the lobby quickly," says AWA partner Kyle Lommen, referring to the stair as a device for preventing newcomers from falling victim to elevator gridlock. "There is also a ceremonial quality in moving between a gallery and the lobby by another means than the elevator."

For AWA founder Cloepfil, the aesthetic goal was "to have the stair be as transparent as possible and to float in space. We wanted the ceremony but we didn't want it to become a major spatial plug. The quality of the structure, the floating metal plate, is just structural transparency."

Realizing this vision of something so sheer that it didn't visually intrude in the small lobby required some literal heavy lifting. The stair, which extends from the cellar floor to the second-floor gallery ceiling, is suspended on 300 Jakob Inox 6mm 1x19 stranded-



Previous spread, opposite and top: © Adam Frieberg; right: Allied Works Architecture

**Previous spread** Though it occupies valuable space in the museum's ground floor, the stair fulfils the architect's vision of a transparent, floating structure that allows visitors to move between floors with ease. The lobby also features Yves Behar's Swarovski crystal chandelier, *Mini Voyage*.

**Facing** Three-eighths-inch-thick A36-grade steel plates were welded together to form the stair's risers and treads, which were assembled in four main sections with two landings.

**Above** The stair hangs from the second-floor gallery ceiling on 300 Jakob Inox 6mm 1x19 stranded-wire cables.

**Right** The second- and third-floor gallery plans.



wire cables tensioned to approximately 900 pounds. Each of the woven stainless-steel stringers, which list a minimum breaking strength of 22.0 kN, measures ¼ inch in diameter. Spacing is 2½ inches on center to also function as a balustrade.

The subjects interviewed for this story say that no such installation has been attempted before. In that vein, Lommen says choosing a subcontractor "came down to who really wanted to take it on." The successful bidder was United Iron, Inc. (UI), and president Randy Rifelli concurs with a laugh, "It was beyond a challenge! It was one of the most difficult jobs we've ever done. And it was unknown, this concept of hanging stairs on cables without supports."

UI's first step was to fabricate the ¾-inch-thick A36-grade steel plate that appears to run among the three floors without a seam. Steel plates were welded together to form the stair's risers and treads. Then each fully welded plate combination was welded to the next riser-tread module. The stair assembled into four main sections with two separate landing sections; Rifelli says his team used partial-penetration welds at each plate connection throughout the stair. Because four cables penetrated each tread, and each cable is single-span, "the cable ran through four points of the stair and it was critical that they line up perfectly," Rifelli says. "The visual vertical alignment is what provides the architectural splendor. To weld each plate to each other and to accurately drill the multitude of holes for the cable spacing was the tough part. To our surprise the lineup of the holes was better than expected."

With assembly completed, the stair sections were delivered to the project site on dollies, then hoisted into place via electric chain fall. Because the finish cables of the stair were only 3 inches from the walls, the cables could not be installed until the walls were finished. "The stair stayed on designed temporary channel supports for months while the walls were finished by other trades," Rifelli says. Indeed, the tight installation required careful project choreography. The plan was to have a maximum amount of finish work completed, with just minimal building structure exposed, when the stair was initially put in place. To finish the stair, the crew welded the sections together—performing on-site bead blasting at the welded location to complete the finish—and then installed and tensioned the cables for the stair. Just as they tensioned the cables by hand at the structural supports, United Iron's crew also performed the meticulous work of manually threading the 300 cables through their corresponding holes, and then of clamping and pinning them to the treads. (White oak tops the riser treads, appearing to cascade down the angular bent steel.) "We didn't have a lot of people doing it," Rifelli says, "but we did have a lot of man-hours."

Although one of the building's most expressive, and controversial, features is its new skin (created by incising the original windowless, load-bearing walls to allow light entry, giving MAD the overall appearance of a fragile shell beginning to break open), it is the lobby stair's seemingly unprecedented construction that represents the best of Cloepfil's design—the derring-do of the structure and its commitment to skilled execution. **M**



Above: © Adam Friedberg; left: Hélène Binet

© Adam Friedberg



**Facing above** Cables were tensioned by hand at the structural supports, then manually threaded through their corresponding holes and clamped and pinned to the stair's treads.

**Facing left** The new face of 2 Columbus Circle.

**Above** The woven stainless-steel stringers, which list a minimum breaking strength of 22.0 kN, each measure ¼ inch in diameter.

#### MUSEUM OF ARTS AND DESIGN

Location: **2 Columbus Circle**

Owner: **Museum of Arts and Design**

Architect: **Allied Works Architecture**, New York, NY

Structural Engineer: **Robert Silman Associates**, New York, NY

Mechanical Engineer: **Arup**, New York, NY

Construction Manager: **F.J. Sciamè Construction Co., Inc.**, New York, NY

Curtain Wall Consultant: **R.A. Heintges & Associates**, New York, NY

Structural Steel Fabricator and Erector:

**Cross County Contracting, Inc.**, Pine Bush, NY

Miscellaneous Iron Fabricator and Erector: **United Iron, Inc.**, Mt. Vernon, NY

Architectural Metal Fabricator and Erector: **United Iron, Inc.**, Mt. Vernon, NY