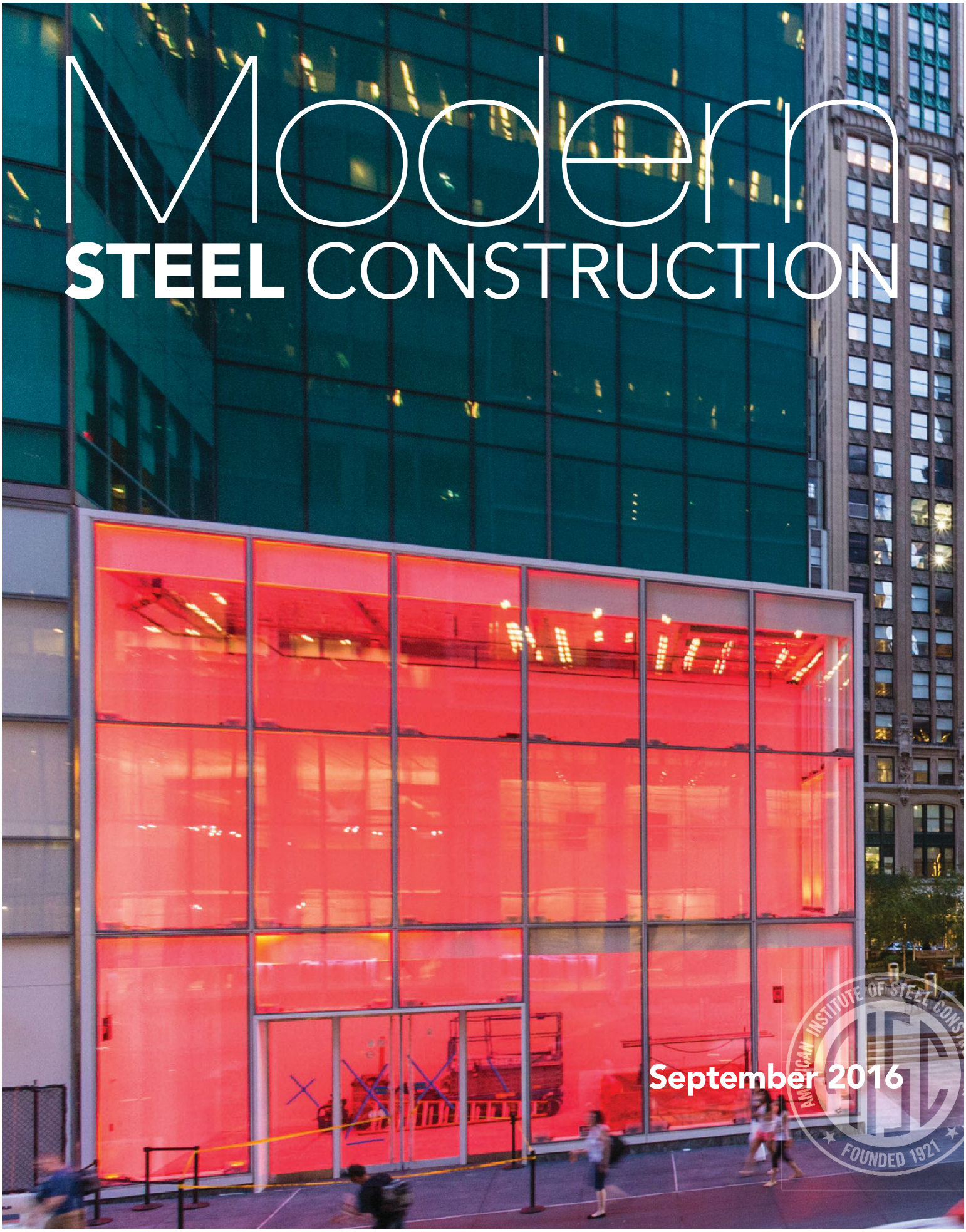
Modern STEEL CONSTRUCTION



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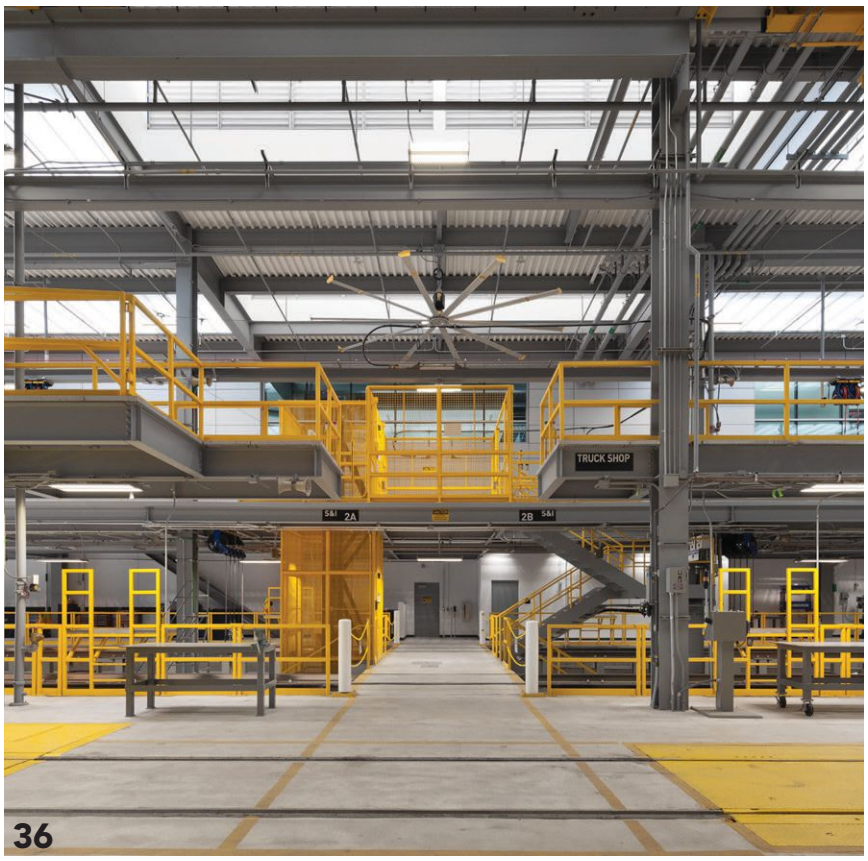

36

columns

in every issue

features

ON THE COVER: A cubic take on retail space, p. 42. (Photo: Courtesy of MdeAS Architects)

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structurally sound

TUBULAR TRANSFORMATION

A NEW SCULPTURAL pavilion is undergoing a metamorphosis in Merriweather Park at Symphony Woods in Columbia, Md.

Initially conceived as a pure compression shell of shingled steel or aluminum plate, the project stayed true to its name—the Chrysalis—as its design was transformed to include a ribcage of structural steel.

On behalf of the Inner Arbor Trust, Michael McCall, president of developer Strategic Leisure, tasked designer Marc Fornes/TheVeryMany with creating this one-of-a-kind park pavilion; Living Design Lab functioned as the architect of record for the project. The steel frame, designed by Arup in Washington D.C., is doubly curved, like the skin it supports, and follows the pleats of the distinctive ridged cladding (the steel was curved by AISC member Kubes Steel, Inc.). Each warped arch is tied together by secondary members to help redistribute loads and increase the stability of the overall frame. The largest arch frames the main performance stage and has an approximate span of 65 ft, with a corresponding max height of 50 ft. The arches are composed of 1,000 linear ft of 10-in.-diameter hollow structural sections (HSS), with 675 ft of straight 8-in.-diameter HSS being used for the secondary framing.

The frame will ultimately be clad in 12,000 sq. ft of anodized aluminum shingles made and installed by Zahner. The cladding system uses an additional layer of framing to help achieve the peaks and valleys of the skin. This frame is composed of ribbed purlins, arrayed at 30-in. centers, that attach directly to the primary steel frame. Due to the structure's complex form, BMT Fluid Mechanics performed a wind tunnel test to attain the appropriate design loads on both the structure and cladding.

In addition, robust analysis was performed to validate the overall stability of the frame, with flanged, bolted moment connections providing continuity across the whole system. The arches were spliced to both aid in erection and help achieve the required curvature of the sculpture. A tertiary layer of steel sits below the primary frame to provide a grid of strong points that can support up to 20 tons of theater equipment. In total, the structure shelters a footprint of 5,000 sq. ft, providing an ample amount of stage space for a variety of performance events, as well as an open-air pavilion for public gatherings. ■