

structurally
sound

NIGHT VISION



THANKS TO AISC DESIGN GUIDE 27: *Structural Stainless Steel*, a new public art installation in Iowa is setting imaginations awirl.

Called *Swirl*, the \$1.5 million sculpture, commissioned by Des Moines Performing Arts, sits at the center of the redeveloped Cows Commons public space in downtown Des Moines. *Swirl* was designed by Jim Campbell, a San Francisco-based artist known for his low-resolution LED art installations, via his studio, White Light, Inc. The sculpture stands approximately 30 ft tall and over 90 ft long and is constructed of two grades of stainless steel. The nine slender, curved columns of the sculpture have been engineered down to a size of 6.5 in. in diameter in order to meet the Campbell's geometric aspirations. The steel structural supports are integral with the upper and lower ring beams and carry 18 radial "ellipses." The ellipses are comprised of stainless steel channel sections affixed at varying angles that carry more than 8,000 dual-sided, low-resolution LEDs. These low-res lights are programmed to display moving images that circumnavigate the sculpture itself, and are softened by curved Plexiglas that covers the open, inward-facing side of the channel sections in such a way that the pixels can be viewed from the inside or outside of the sculpture.

Campbell had initially intended the piece to be defined by curved, slender supports that rise up and meet the rest of the revolving steel elements. Initially, Grade 316 stainless steel pipe was considered, but it was shown that this material would require columns with diameter up to 8.5 in., which was deemed unacceptable. Campbell appointed structural engineer Arup to develop a solution that would effectively reduce the diameter of the columns without sacrificing the structural integrity of the sculpture. With the guidance of the new Design Guide 27, Arup produced an alternative solution that employs 6.5-in.-diameter curved columns comprised of duplex stainless steel at the bottom of the columns that transition into austenitic Grade 316 stainless steel above, where the stress demands are lower.

The installation projects low-resolution moving imagery specific to its location and is intended to be viewed after nightfall. Campbell was concerned that a more "traditional" structural support would look too "utilitarian" or "scaffolding-like" during the day, so the challenge became to support the pixels with an aesthetically-pleasing sculptural form that could be appreciated and enjoyed for its own merits when the pixels were not illuminated. ■