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MERIT AWARD Special Purpose
Dublin Link Pedestrian Bridge
Dublin, Ohio

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THE DUBLIN LINK presents an iconic form while simultaneously evoking a feeling of weightlessness for pedestrians and cyclists as they cross above the Scioto River riparian corridor.

In addition to tying together the eastern and western sides of Dublin, Ohio, it is a destination in its own right. The formal aesthetic and structural methods were developed simultaneously to create a single coherent vision. The resulting sinuously curving, structurally unique suspension bridge binds together cultural and economic additions to the city, including a new public library, a dramatic riverbank park, and multiple new entertainment, retail, and office projects at both ends. The structurally innovative locus for the city's ambitious program of urban renewal is also the longest S-curve single-side suspension bridge in the world.

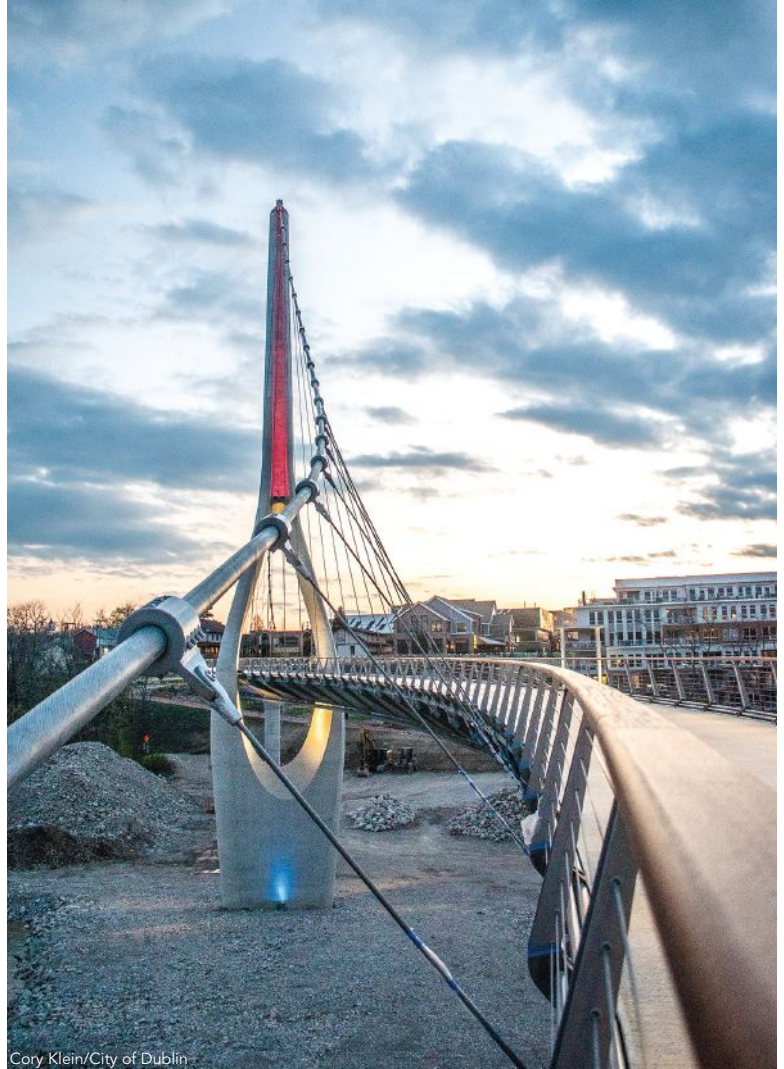
The Scioto River bisects the town, causing a shift in the urban fabric from east to west. The offset between Bridge Park Avenue and West North Street became the impetus for the bridge's S shape. This form has its historical precedent in the S-bridges used to efficiently cross streams in eastern Ohio during the construction of the National Road in the early 19th Century.

The sculptural form is rooted in stress-shaping operations and optimization, and the bridge is supported by an expressive central eye-of-the-needle pylon that the bridge deck passes through, conceptualized as the gateway between the historic town center and the newly developed mixed-use district on the east bank. This central pylon aligns with the main cable at the top, twists down to the eye-of-the-needle (which is perpendicular to the steel bridge deck), and continues twisting to minimize drag and scour from the river at the flood stage.

The triangular steel box girder also morphs throughout the main span, and the single-side stay-cable attachment points shift in order to align the stay cable line of action with the cross-section's shear center. This minimizes the induced torsion in the box-girder. Any incidental torsion is resolved by balancing each side of the S-curve across the central pylon support.

• **Bridge Stats**

- Crosses: Scioto River
- Span length: Four 65-ft-long approach spans, 500-ft-long suspension span
- Total structure length: 760 ft
- Average structure width: 14 ft
- Steel weight per deck area: 0.04 tons per sq. ft
- Total amount of structural steel: 412 tons
- Approximate total cost of bridge: \$23,000,000
- Corrosion protection: Organic zinc-rich primer, epoxy intermediate coat, and top coat



Cory Klein/City of Dublin

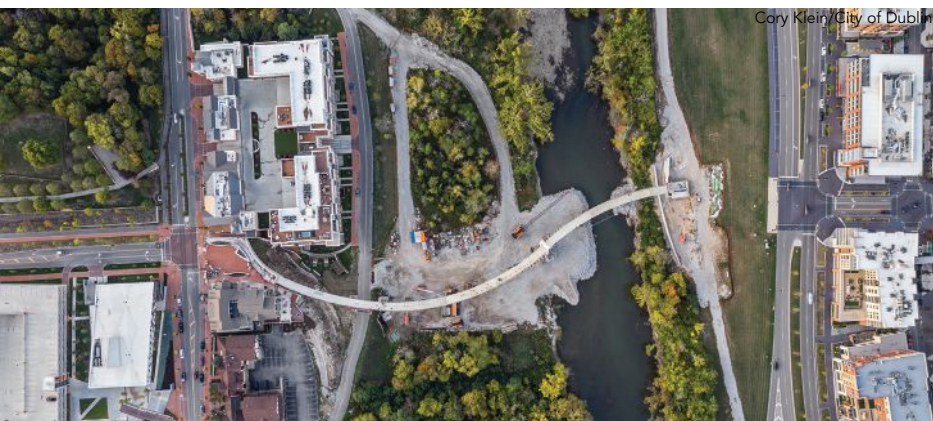




Cory Klein



Endrestudio



Cory Klein/City of Dublin



Cory Klein

Because of the lightness and slenderness of the bridge deck, it was critical to have horizontal vibration controls. A combination of tuned mass dampers in the bridge transition zones and a pendulum-tuned damper at the main cable termination point created significant damping of the structure.

Lateral vortex shedding was also found to be a potential problem during wind-tunnel testing. The addition of an inverted vane helped to stabilize the bridge from wind-induced vibrations and also provided a natural place to run deck lighting to highlight the underside of the bridge deck.

The complexity and required precision of the central tower for both aesthetics and structural performance posed one of the biggest challenges to construction. Hundreds of precisely milled CNC form inserts were created from the digital model and installed in a reusable outer form. The design team used the model to precisely lay out every piece of rebar for the central tower and speed up placement during construction. The contractor developed its own model independently, which was compared directly to the design team's model as part of the quality control program.

In addition to the integrated modeling, significant sequencing coordination was required between the assembly of the prefabricated steel box girder sections, the site works for the approach spans and the central pylon, and the routing of electrical and communication lines through the triangular section of the bridge. The fully locked main cable and shifting attachment points of the stay cables also demanded an exceptional level of precision in the erection and finishing of the iconic bridge.

The Dublin Link was designed to be an icon. From the initial competition to its final completion, each aspect of the bridge was conceived simultaneously as a sculptural form, an elegantly efficient structure, and a surprising, dramatic experience for visitors and residents alike. ■

Owner

City of Dublin, Ohio

General Contractor

Kokosing Construction Company, Inc.

Architect/Design Engineer

Endrestudio

Structural Engineer


T.Y. Lin International

Steel Team

Fabricator and Erector

Tampa Steel Erecting  Tampa, Fla.

Detailer

Tensor Engineering Co.  Indian Harbour Beach, Fla.

Bearing Manufacturer

R.J. Watson, Inc.  Alden, N.Y.