

HUMUNGOUS

Hell Gate Bridge

Milwaukee railroad club builds a 28-foot-long replica of a famous New York bridge

story by Gerald Anderson and Michael Sadowski
photos by Gerald Anderson, except where noted

AS MEMBERS OF MILWAUKEE'S Lionel Railroad Club, a 59-year-old organization that's built several layouts, we like to think there aren't many projects this hard-working, hobby-loving group can't tackle. The club can now add to its list of successful ventures the design and construction of a 28-foot-long, 250-pound model of New York's famous Hell Gate Bridge.

This massive undertaking all began in 2002, when the club purchased its own two-story commercial space and began to build a new 30- by 54-foot, multi-level layout. We had trouble resolving how the three mainline tracks on the 8-foot-tall upper level would connect from one side of the room to the other. That's when club member John Bristow proposed the idea of bridging the gap – a 28-foot span that's as long as two Dodge Neons placed bumper to bumper across the room.

Members initially considered modeling a couple of intriguing, though little-known, Milwaukee-area bridges. While either bridge would've reflected our club's strong sense of community pride,

neither structure was a railway bridge. Another suggestion was to model the Hell Gate Bridge, New York City's landmark bridge that, thanks to Lionel, has also become an icon of the vintage toy trains we love.

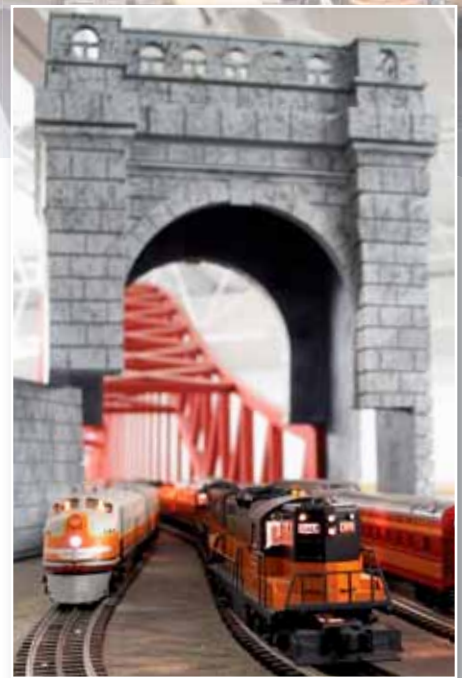
As we looked into the specifications of the real Hell Gate Bridge, we discovered a number of characteristics that made the structure quite suitable for construction on our layout.

Bridge under construction

With a vision of the bridge in his head, John's first step was to start recruiting help from fellow club members. Next, he and Brian Mateljan began surveying the layout location to develop a precise plan for the bridge.

Once John had a ¼-inch-to-the-foot scale drawing, he contacted a friend who had access to a CNC (computer numeric control) machine and router. Using these precision tools, John and his friend cut ten arch sections from 4- by 8-foot sheets of ¾-inch MDO (medium density outdoor) plywood.

To give the bridge arch a steel I-beam facade, we added 1¼- by ¼-inch clear



pine lathe to the profile of each section. Unfortunately, each piece had to be custom-trimmed and fitted.

As we worked three evenings a week, sometimes as late as 10 p.m., another member, Fred Michalek, started framing the two abutment towers using dimensional lumber and ¼-inch plywood.

Some assembly required

To assemble the 10 arch sections, we first drilled holes in the lap joints, then glued, clamped, and bolted each of the five joints used to connect each section. As we fit sections together, what began as a few manageable parts grew into a



◀ Although not all of the MLRC members who assisted appear in this photo, (clockwise from lower left) Mike Sadowski, Gerald Anderson, Dave Oelstrom, Gene Senger, and Fred Michalek admire the completed bridge and the entire group's effort.

By draping plastic sheets down from the ceiling trusses, we were able to fabricate our own enclosed paint booth. Additionally, we covered the floor with a layer of plastic topped with cardboard.

Using a color photo of the prototype as a reference, we had a paint store match and mix the red latex paint we'd apply to the bridge arch. After coating the bridge with medium gray primer, we then applied two coats of Hell Gate Red to every nook and cranny.

After allowing the paint to dry for one week, it was time to lay track. The upper level of the layout has three loops of track, two are O gauge and one is a combination of O and Standard gauge. Using GarGraves track, we completed one line across the bridge before moving to the next.

Since we didn't want any wires to show above or below the bridge deck, we soldered every connection of rail to guarantee continuity. Additionally, we positioned power feeds at both ends of the span to help minimize voltage drop.

Tower above the layout

The rough framework for the two abutment towers was already in place, so now we just had to figure out how to lift the 28-foot-long, 250-pound bridge arch some 8 feet above the floor. We borrowed cable lifts to raise the bridge into place and anchored it to 1/2-inch by 6-inch angle iron mounted on the support towers. As a safety precaution and to help prevent structural sagging, we strung two 1/8-inch-diameter aircraft cables down from the ceiling trusses to the middle of the bridge.

Next, we trimmed the top third of the tower with narrow 1/4-inch pine lathe and the remaining lower portions with progressively wider 2 1/2-inch strips of 3/4-inch plywood and 3 3/4-inch strips of 3/8-inch plywood. Starting at the bottom of each tower, we then nailed the strips with the joints staggered and all corners neatly miter cut.

One of the last steps in constructing our bridge was to install the finished tops for the towers. Using a cardboard pattern, we constructed the tops from 3/4-

inch plywood and cut the openings with the aid of a router. Lastly, we added the veneer of pine lathe used to represent masonry work.

After priming the completed towers, Dave and Fred sprayed them with a base coat of medium gray latex paint and let them dry overnight. To give the towers the appearance of granite construction, Mike and Gene then used a sponge to apply darker colors of gray and black.

When we finally set our tools down to admire our work, all those involved in the club's effort recognized two things. Not only had we connected two sides of a train layout in an impressive fashion, but we had also bridged many new friendships in the process.



Lionel's No. 300 Hell Gate Bridge

Bridges are some of the first accessories made by Lionel. Nearly a full century later, they're still considered some of the most impressive structures you can add to any layout. The Lionel no. 300 Hell Gate Bridge is arguably the grandest toy train bridge ever manufactured.

Originally cataloged in 1928, the huge sheet-metal span of the Lionel bridge resembles New York's famous Hell Gate Bridge. The 29-inch-long, 11-inch-wide, 10 1/2-inch-high structure was built sturdy to carry Standard gauge trains. However, O gauge trains look just as respectable. — Editor

sizeable structure that required additional muscle from Gene Senger and Dave Oelstrom to complete.

Meanwhile, Craig Vierck and Mike Hilbert crafted the bridge deck from angular aluminum that they welded into a ladder configuration. We then screwed 1/4-inch plywood to the aluminum frame and glued 1/2-inch Homasote to the top of the deck to provide a roadbed for the three tracks. To give the deck a prototypical appearance, we glued 1 1/2-inch foam-board insulation between every cross member and trimmed it with 1/4-inch pine slats to represent I-beams.

We completed the assembly by bolting the sides of the bridge to the aluminum deck and installed 24 cross-members made from HDO (high density overlay) plywood to help keep the upper portions aligned. Finally, we attached 1/4-inch dowels to the sides of the bridge to match the prototype and prevent any derailed trains from falling to the floor.

Primed for painting

We decided to use a low-pressure airless paint sprayer to give the bridge a professional-quality finish.

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HUMUNGOUS HELL GATE: Built like a bridge

ABUTMENT ASSEMBLY



▲ Dimensional lumber and ¼-inch plywood frame the towers. To make them appear more like masonry work, we covered the frame with varying dimensions of plywood strips scored with mortar lines spaced 2½ inches apart.



BRIDGE ARCH ASSEMBLY



▲ Assembling the router-cut plywood arches required more assistance as the bridge grew longer and heavier. The structure eventually required dollies to move around the room.



HELL GATE LIFTBRIDGE?



PRIMED FOR PAINTING



▲ There just aren't many convenient places to paint a 28-foot-long railroad bridge. Out of necessity, we erected our own spray booth by hanging sheets of plastic from the ceiling trusses. Using a low-pressure airless paint sprayer, we first primed and then covered the arch with a custom shade of red latex paint.



12-FOOT HEIGHT AT PEAK OF ARCH

7-FOOT CLEARANCE UNDER DECK

11-FOOT-TALL ABUTMENT TOWER

TOP IT OFF



PHOTO BY JIM FORBES

◀ Raising the 250-pound bridge arch some 8 feet above the floor required more than brute strength. We borrowed two cable lifts to hoist the bulky structure up and into place.

▶ The crowning edifice originates from a cardboard template. Using this pattern, we constructed the two tops from 3/4-inch plywood and added the veneer of pine lathe to represent masonry.



To learn more about the Milwaukee Lionel Railroad Club and its previous O gauge display layout, go to classictoytrains.com