

BEST REHABILITATED BRIDGE

Willey Road Bridge Over Paddy's Run, Hamilton County, Ohio

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Engineer's Comments:

"Prestressed box beams were selected for their cost savings over conventional cast-in-place concrete and for the speed of construction they gave us," says William B. Schrudde, P.E., chief bridge engineer at KZF Incorporated. "Their use let us maintain the original historic appearance. There are fewer than 20 concrete rainbow-arch bridges still in use in Ohio, and this design helped ensure this one would continue in use for many years."

DESIGN GOALS:

- Maintain the historic character of the original 1931 concrete rainbow-arch bridge.
- Meet all state safety, technical and preservation standards.
- Retain the existing concrete through-arches.
- Keep all construction out of the underlying stream for environmental reasons.

PRECAST SOLUTIONS:

- To maintain the original look, precast concrete box beams were designed to support the new concrete deck.
- Coil inserts were used in the beams as needed for attachments. Corbels were fastened to the box beams to replicate the ends of the original floor beams.
- The concrete deck was made composite with the beams to carry the HS-20 design load. Polypropylene fibers were added to the deck concrete to minimize shrinkage cracks.
- The concrete through-arches were left in place to retain the original character, but they no longer carry live loads.
- The use of prestressed box beams not only cut costs over cast-in-place construction, but sped up the schedule, lowering the bridge's closure time to only four months.
- Casting box beams in the factory allowed the team to control quality and ensured the components were delivered to the site as needed, keeping all construction out of the stream bed.



PROJECT SPECS:

- Seven box beams spanning 61'7" long
- Six CB 33x48 beams plus one CB 33x36 beam
- 31'3" wide

ENGINEER

*KZF Incorporated
Cincinnati, Ohio*

PRECASTER

*Prestress Services Inc.
Decatur, Ind.*

GENERAL CONTRACTOR

*Sunesis Construction Co.
Cincinnati, Ohio*

OWNER

*Hamilton County Engineer
Cincinnati, Ohio*

Seven prestressed box beam girders were used to rehabilitate the Willey Road Bridge over Paddy's Run near New Baltimore, Ohio. By retaining the existing concrete through arches without relying on them to carry load, the bridge could retain its original 1931 aesthetic look.

Judges' Comments: *"This project shows what modern engineering can do to preserve existing structures. It offers a good and interesting solution for short bridges that have to be rehabilitated, while giving appropriate consideration to blending it into the community. It provides new options for designers faced with the challenge of rehabilitating historic structures using modern materials."*