

# Restoring A Flood-Ravaged Infrastructure

## L.R. Kimball Bridge and Culvert Designs Speed Up Recovery Efforts



### THE SITUATION

In June 2006, an unrelenting storm quickly dumped 13 inches of rain across northeastern Pennsylvania and Pennsylvania Department of Transportation's District 4-0 (District 4-0). With rampant flooding, more than 170 roads were closed and 26 bridges were damaged beyond repair.

District 4-0 was faced with a pressing need to reopen as many transportation arteries as possible. L.R. Kimball and HRI, Inc. submitted the most competitive design/build bid and received a contract to replace two bridges and one culvert. Backed by L.R. Kimball's in-house network of experienced engineers, the team completed the three designs to client specifications as rapidly as possible. As a result of effective project management, the culvert was the first of all District 4-0 flood-related emergency projects to be constructed and open to traffic. The bridges were open shortly thereafter.

### THE CHALLENGE

Time was the biggest obstacle to the successful completion of each project. With numerous bridge closures across the District, the region's transportation network was severely compromised. District 4-0 needed an immediate and structurally sound remedy to restore the region's transportation flow – and it needed it immediately. The three projects, all located in Wayne County, demanded a focused approach to ensure that they could proceed with little interruption and few, if any, problems in construction.

In addition, one of the washed-out bridges had been located near a historically sensitive mill and a mill race cut through one of its remaining abutment wings. As a result, its design needed to replace the abutment while maintaining the historical appearance of the site.

### THE SOLUTION

As a design/build project, L.R. Kimball developed and completed each design, and worked with HRI, Inc. as it constructed the two bridges and one culvert. In just over 30 days, the team successfully completed three designs for District 4-0, including:

- Final design of a simple-span, prestressed concrete spread box beam bridge with a fixed abutment and an integral abutment on SR 4020
- Final design of a historically-inspired simple-span, prestressed concrete adjacent box beam bridge across a portion of SR 3034, including:
  - Substructure form liners
  - Stamped concrete deck
  - Wood railing
- Design/build construction for a 14-foot span of a reinforced concrete box culvert along SR 4002

L.R. Kimball engineers also coordinated the waterway permitting process, developed comprehensive erosion and sedimentation control plans, produced detour and traffic control plans, and carried out approach roadway work for each project.

## Project Overview

### CLIENT

PennDOT District 4-0  
(Northeastern Pennsylvania)

Wayne County Bridges  
Flood Recovery Project

### GOAL

Design two bridge replacements  
and a culvert damaged during  
historic flooding

### L.R. KIMBALL SERVICES

- Bridge and culvert design
- Highway design
- Waterway permitting
- Highway engineering
- Erosion and sedimentation planning
- Detour and traffic control planning



**L.R. Kimball**<sup>SM</sup>  
TARGETED RESULTS. EXPERTLY MANAGED.  
WE STAKE OUR REPUTATION ON IT.

A CDI Company

## ARCHITECTURE • ENGINEERING • COMMUNICATIONS TECHNOLOGY

AVIATION | CIVIL | CONSTRUCTION SERVICES | DATA SYSTEMS | ENVIRONMENTAL  
FACILITIES ENGINEERING | GEOSPATIAL | NETWORKS | PUBLIC SAFETY | TRANSPORTATION

## THE RESULTS

With nearly 60 years of engineering and transportation experience, L.R. Kimball was able to quickly and adeptly respond to PennDOT's urgent call for cost-effective bridge design. The efficient designs, developed on an aggressive timetable, met all client specifications. As a result, District 4-0 was able to open these structures on time and without overages. Today, the structures are fully operational.



Waymart Before



Waymart After



Varden Before



Varden After