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Synopsis:

This bridge carries 1-490 over the Genesee River and several streets in downtown Rochester, NY. When deterioration necessitated a new bridge, engineers sought context sensitive replacement. The bridge's location affords opportunities for aesthetic enhancement: it is set in the foreground of the city skyline, which includes architecturally noteworthy buildings that house mainstays to international businesses such as Eastman Kodak, Xerox, and Bausch & Lomb.

The project design team included NYSDOT, Erdman Anthony and Associates, Inc. and H2L2 Architects. An Aesthetics Committee comprised of local government officials, adjoining neighborhood representatives, AIA members and artists provided feedback throughout the design process, ensuring the solution fit the environment. Many of the committee preferences were implemented to the final design.

The centerpiece of the new eight span bridge will be a 132 m (433 ft.) long through arch span crossing the river. The arch will feature three steel box ribs, Vierendeel style braces and a fanned hanger arrangement supporting the deck system. Aesthetic enhancements were achieved in many areas of the main span design. Arch anchorages were set back from the riverbanks to allow shoreline promenades beneath the bridge. Accent lighting and sculpted floorbeam shapes were provided to enhance visual interest from the promenades.

Given the through arch design, as well as the high volume of daily traffic over the bridge, there are significant challenges to be addressed during construction. Structural design details were developed to allow for staged construction which permits the bridge to remain open throughout construction.
About the Presenter:

Mr. Ressel is a Project Design Engineer with New York State Department of Transportation. He is a Licensed Professional Engineer and received a B.S. in Civil Engineering from the State University of NY at Buffalo (1984). His duties include supervising a highway design squad and overseeing the design of several ongoing highway reconstruction projects.

Mr. Ressel also serves as the Region's Metrication Manager, chairs the Region's PC Users Group and acts as representative to the Statewide Design Standards Committee. Mr. Ressel also is represented on a NCHRP project panel sponsored by the Transportation Research Board and serves as a member of the IEEE Coordinating Committee SCC14 and SI10. He is also a member of the New York State Association of Transportation Engineers and serves on several committees including the Scholarship Committee which he chairs. Mr. Ressel was chosen as the Association's Section 4 Engineer-of-the-Year in 2002.
I-490 Western Gateway Project
Erie Canal to Genesee River

I-490 Western Gateway Project Limits
Key link to Rochester Highway System
Critical for West Side Commuters
I-490 Western Gateway Project

- Pavement Rehabilitation
  - Median Improvements
  - Widened Shoulders
  - New Signs, Pavement Markings
  - Noise Barriers
  - Improved Drainage
  - Safety Improvements
  - ITS System
  - Aesthetic Improvements

- Bridge Reconstruction

- Multi Year
- Multi Contract
Community and Local Government Involvement

- AIA
- Rochester Bicycling Club
- The Landmark Society of Western New York
- City of Rochester
- Rochester Fire Dept.
- Rochester City School District
- GTC
- Lu Engineers
- Greater Rochester Visitors' Association Program Guide to Membership Benefits
I-490 Western Gateway Project

Contract # 1 Overhead Bridges/Noise Barriers

View of South intersection - Saxton Street and Wilder Street
I-490 Western Gateway Project

Contract # 1 Overhead Bridges/Noise Barriers
I-490 Western Gateway Project
Contract # 1 Overhead Bridges/Noise Barriers
I-490 Western Gateway Project

Contract # 2 ITS System
I-490 Western Gateway Project

Troup-Howell Bridge Replacement
I-490 Western Gateway Project
Erie Canal to Genesee River

Contract #3 Troup-Howell Bridge Replacement

Troup Howell Bridge Replacement
100,000 Vehicles per day
4 lanes in each direction
Bridge History:

- Originally built in 1954 - 15 spans, 6 lanes & sidewalks
- Reconfigured for I-490 / Inner Loop in 1974
I-490 Western Gateway Project

1929 Major Street Plan

A MAJOR STREET PLAN FOR
ROCHESTER
NEW YORK

PLANNING BOARD

KESSLER PLAN ASSOCIATION

BARTHOLOMEW & ASSOCIATES
City Plan & Landscape Engineers
Saint Louis - Missouri
STATE OF NEW YORK
THOMAS E. DEWEY, GOVERNOR

REPORT ON ARTERIAL ROUTES IN THE ROCHESTER URBAN AREA

Prepared by
THE DEPARTMENT OF PUBLIC WORKS
CHARLES H. SELLS
Superintendent

CLAUDIA BONAPARTE
Deputy Superintendent

BERTRAM D. TALLAMY
Chief Engineer

1947
I-490 Western Gateway Project

Contract #3 Troup-Howell Bridge Replacement

Original Rendering - 1998

Final Rendering - 2004
I-490 Western Gateway Project

Contract #3 Troup-Howell Bridge Replacement

River Walk Enhancements
I-490 Western Gateway Project
Contract #3 Troup-Howell Bridge Replacement

Railing and Barrier System
I-490 Western Gateway Project
Contract #3 Troup-Howell Bridge Replacement

Diagram showing typical barrier, concrete barrier, Pennsylvania barrier, section A, and section B.
I-490 Western Gateway Project

Contract #3 Troup-Howell Bridge Replacement

Sculpted Floor Beams

Ribs & Cross Bracing
I-490 Western Gateway Project
Contract #3 Troup-Howell Bridge Replacement
Arch Rib Size

Aesthetic Stiffener
(2 @ Hanger Locations)

3.0 m

1.780 m

Interior Rib Section  Exterior Rib Section
I-490 Western Gateway Project
Contract #3 Troup-Howell Bridge Replacement

Cables
I-490 Western Gateway Project

Contract #3 Troup-Howell Bridge Replacement

Exchange Blvd. Enhancements
I-490 Western Gateway Project

Contract #3 Troup-Howell Bridge Replacement
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I-490 Western Gateway Project

Contract #3 Troup-Howell Bridge Replacement

- Light Element
- Stone Element
- Possible Bench
I-490 Western Gateway Project

Contract #3 Troup-Howell Bridge Replacement

Aesthetic Lighting
I-490 Western Gateway Project
Contract #3 Troup-Howell Bridge Replacement

Final Colors

Arch/Cable
Anchorage/Railings/Lights/Signs - Silver/White
Concrete Surfaces - Limestone
Approach Steel & Floor Beams – Redend Earth
I-490 Western Gateway Project
Traffic Control Plan

Stage I (Completed)

Stage I
- 3 Lanes Open in Each Direction
- No Long-term Ramp Closures
Stage II

- Cross-over in Place
- Traffic Moved to WB Travel Lanes
- At Least 2 Lanes Open in Each Direction
- A Few Long-term Ramp Closures (X above)
I-490 Western Gateway Project
Traffic Control Plan
Stage III (Next Phase)

Cross-over in Place
Traffic Moved to NEW EB Travel Lanes
At Least 2 Lanes Open in Each Direction
A Few Long-term Ramp Closures (X above)
I-490 Western Gateway Project

In the News....
I-490 Western Gateway Project

Construction Photos
Acknowledgements...

NYSDOT:

• Commissioner: Thomas Madison
• Regional Director: Charles Moynihan

• Regional Design Engineer: Brian McMahon
• Regional Structures Engineer: Merton Edwards

• Project Design Engineer: Howard Ressel
• Project Structures Engineer: Rich McFadden
• Project Landscape Architect: Kevin Miller
• Project Manager: Barry Quinn
• Utilities Engineer: Mark Pawloski
• Regional ITS Coordinator: Jim Willer

• Regional Construction Engineer: Kevin O’Buckley
• Assistant Construction Engineer: John Starke
• Project Engineer In Charge: Jim Budd
Main Office NYSDOT:

• Deputy Chief Engineer Structures: George Christian
• Structures Design: Mike Seniw
• Director Structural Eng. Service Bureau: Rich Marchione
• Supervisor Metals Engineering: Paul Rimmer
• Supervisor Foundations & Construction: Lou Recchia

• Technical Services - Geotechnical Bureau: Phil Walton
• Technical Services - Materials Bureau: Don Streeter

• Consultant Management: David Chan

Federal Highway Administration:

• Roslyn Webber
• Earl Dubin
Acknowledgements...

Aesthetics Committee

Erdman Anthony & Associates, Inc.

- Lead Structure Design: Sam Anthony
- Structure Design: Steve Gauthier
- Structure Design: Steve Percassi
- Structure Design: Ben Beardsley
- Structure Design: Leszek Janik
- Structure Detailer: Scott Schaffer
- Structure Detailer: Tim Davis
- Lead Highway Design: Paul Presutti

Sub consultants:

- H2L2 Infrastructure Architects: Bruce Chamberlain
- Fisher Associates
- Lu Engineers