

# PREVENTATIVE BRIDGE MAINTENANCE

INVENTORY MANAGEMENT | PROGRAMMING | IMPLEMENTATION



**LABELLA**  
Associates, P.C.

Engineering  
Architecture  
Environmental  
Planning

PRESENTED BY JOHN PAPPONETTI, PE

SEPTEMBER 29, 2011



- **In Business for 33 Years**
- **190 Employees**
- **Headquartered in Rochester, NY**
- **Seven Office Locations in NY, PA, and NC**
- **Full Service Firm: [Engineering](#) | [Architecture](#) | [Environmental](#) | [Planning](#)**

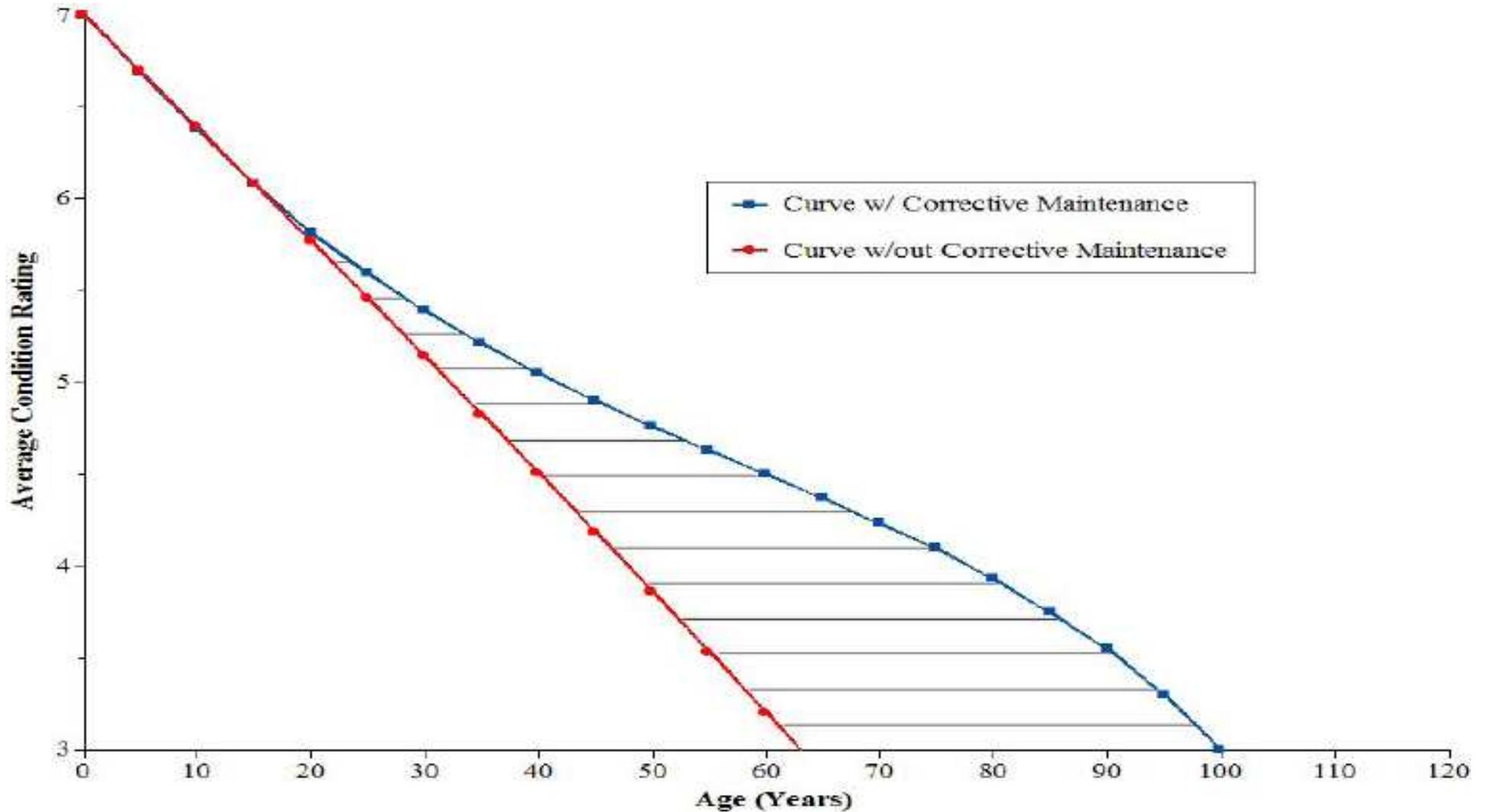
- Rochester, NY (HQ)
- Buffalo, NY
- Ithaca, NY
- Hornell, NY
- Coudersport, PA
- Scranton, PA
- Charlotte, NC



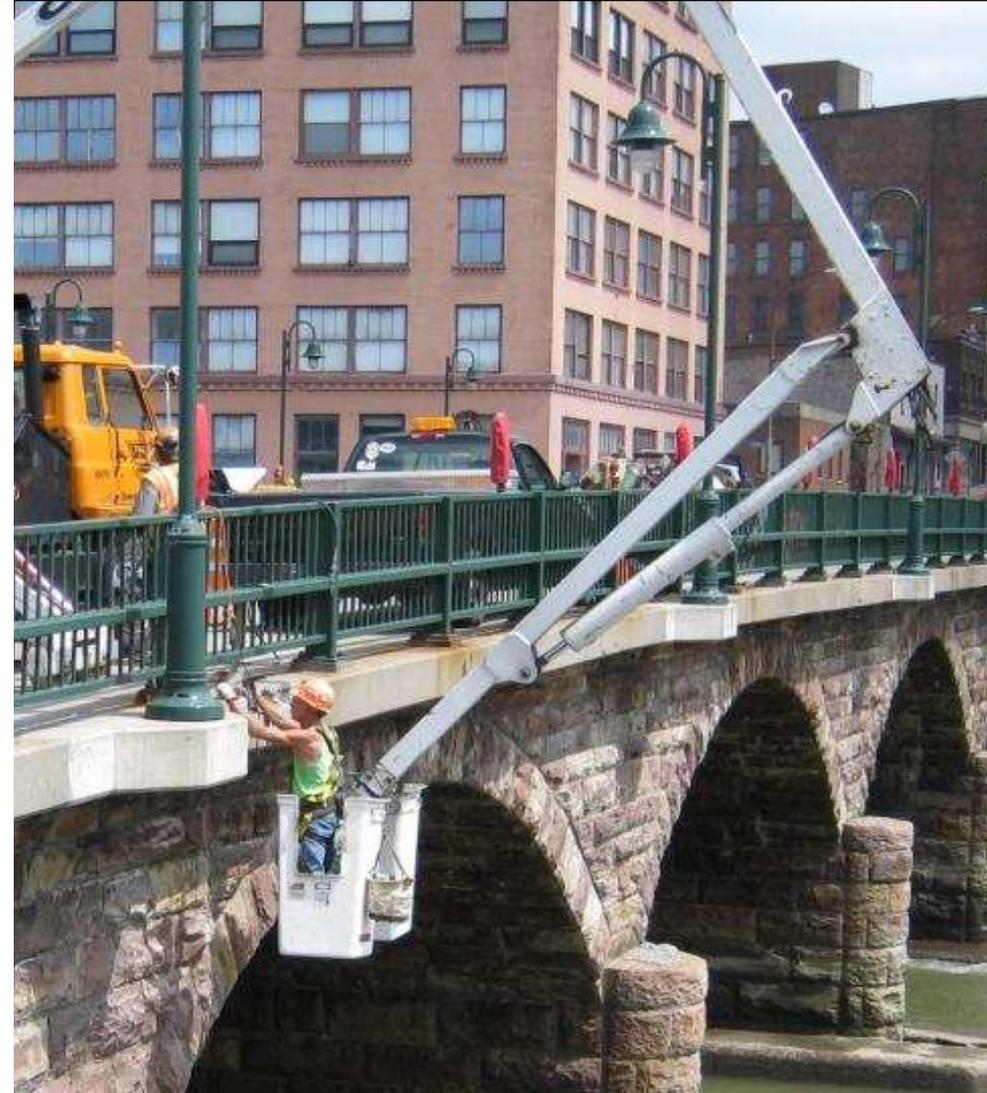
- **14 Years of Experience**
- **Associate and Project Manager**
- **AAS - Alfred State College**
- **BS - Rochester Institute of Technology**
- **PE in NY and PA**
- **Certified through the Structural Engineering Certification Board**



## WHY IS PREVENTATIVE MAINTENANCE IMPORTANT?



- 1. MAINTENANCE PROGRAM HISTORY**
- 2. INVENTORY MANAGEMENT**
- 3. PROGRAMMING**
- 4. IMPLEMENTATION**
- 5. Q & A**



## HISTORY OF THE CITY OF ROCHESTER'S BRIDGE MAINTENANCE PROGRAM

- Program first implemented in 1991
- 100% funded by the City of Rochester
- Average annual maintenance contracts are valued at \$250,000.
- Consultant fees average \$65,000/year
  - \$45,000 for Inventory Management | Programming | Implementation
  - \$20,000 for Construction Phase Services
- John has been involved in this program since 1998
- ***GOAL: Prolong the life of the City's bridge infrastructure and reduce the need for large capital improvements***



- LaBella Associates provides the following services:
  - Coordination & Administration
  - Inventory Database Management
  - Annual Bridge Inspections (Detailed & cursory)
  - Annual Bridge Maintenance Contract Documents
  - Construction Management & Inspection



- **Inventory Management** is a process in which one oversees and tracks their assets.
- **Bridge Inventory** is data pertaining to the identification information, classification, type and material, operational condition, geometrics, load rating and posting, and inspections of the bridge.
- There are several ways to track this inventory depending on the owner's needs:
  - Simple Excel Spreadsheet,
  - Microsoft Access Database, or
  - Bridge Management Software Program
- Database provides a central location for bridge data
  - Photos
  - Inspection Reports
  - Flag Reports
  - Work Orders
  - Contract Documents

## INVENTORY MANAGEMENT

- Mid-1990's - City utilized MS Access to track bridge inventory
- 2008 – City purchased a Bridge Management Software Program to track bridge inventory
- City of Rochester utilizes Cartegraph's BRIDGEview bridge management software program
- Initial purchase cost (including training and customization) = \$15,000
- Yearly technical support and updates = \$1,100 per license

**Cartegraph**



### Advantages of a Bridge Management Software Program:

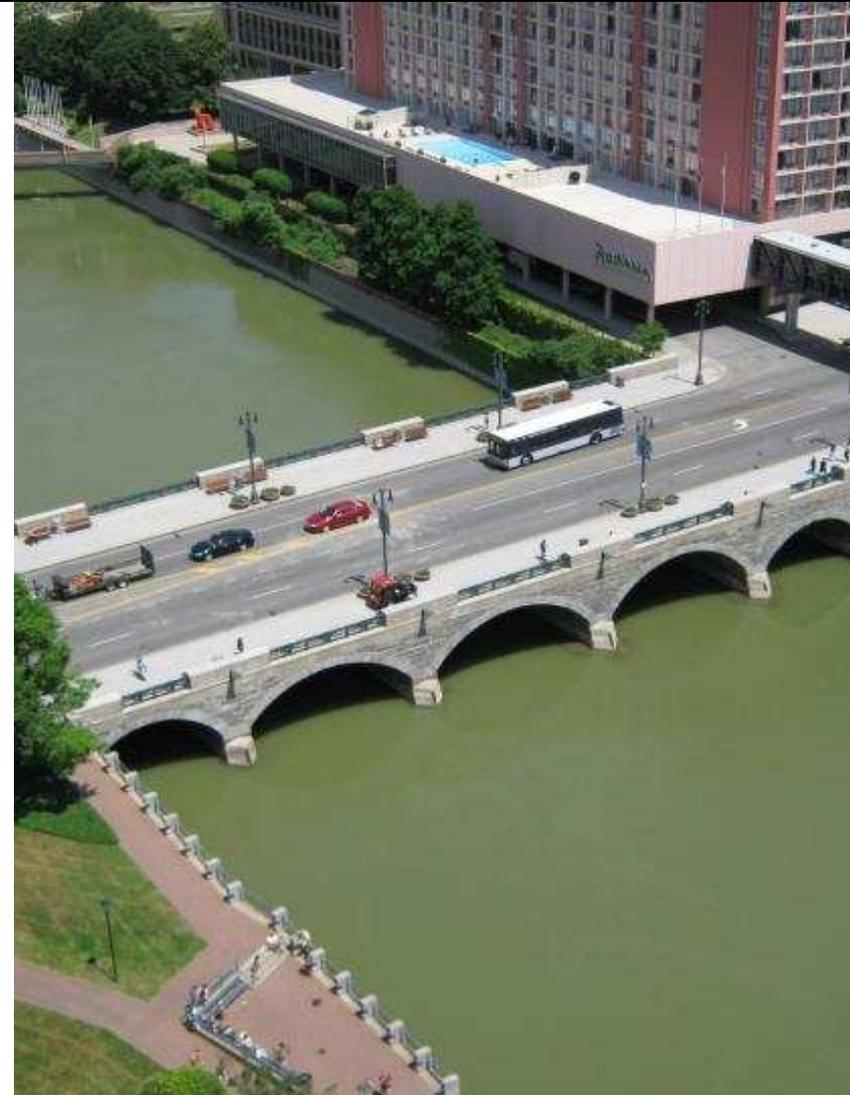
- Accurately capture and maintain bridge data
- Proactively monitor overall condition of bridges
- Track current and historical bridge information
- Assists with factoring bridge maintenance into yearly budget.
- Reporting features help track bridge data that helps establish preventative maintenance schedules, and accurately determine replacement needs.

The screenshot displays the Bridge Management Software interface. The top section is titled "Bridge Information" and includes a search bar with "ID (8): 4443800". Below this are several input fields for "Features": Local ID (E156), Local Name, Structure Type (43B), Structure Material (43A), Features Crossed (6A), Carries (7), Detour Length (19) (2 mi), and Is NBI Structure (112). The "Location" section includes fields for City (4), Township, Route, Marker, and Location Description (9) (Ford St. over Genesee River). To the right, the "Attachments" section shows a photo of a bridge at night. The bottom section is titled "Details" and contains a table of events with columns for Completed, When Started, Activity, When Ended, Work Order Number, Repeat Interval, Who, and Why. The table shows three events: Safety Flag (07/07/2011 to 07/31/2011) by NYSDOT, Safety Flag (07/22/2009 to 08/24/2009) by NYSDOT, and Maintenance (12/31/2009 to 03/03/2011) by CP Ward. A fourth event, Cursory Inspe (04/29/2010 to 04/29/2010), is marked with an asterisk and is by LaBella. On the right side of the Details section, there are buttons for "New Bridge", "Save Bridge", "E-mail Bridge", "SI & A", and "View Bridges Report".

Completed	When Started	Activity	When Ended	Work Order Number	Repeat Interval	Who	Why
<input type="checkbox"/>	07/07/2011	Safety Flag	07/31/2011			NYSDOT	
<input checked="" type="checkbox"/>	07/22/2009	Safety Flag	08/24/2009			NYSDOT	
<input checked="" type="checkbox"/>	12/31/2009	Maintenance	03/03/2011			CP Ward	
<input checked="" type="checkbox"/>	04/29/2010	Cursory Inspe	04/29/2010			LaBella	

- Utilizing the Cartegraph Software Program, generate reports listing bridges with:
  - Element specific deficiencies (condition ratings  $\leq 4$ )
  - Safety concerns
  - Cyclical maintenance needs
- Based on this information, maintenance needs are prioritized
- Estimate cost to eliminate deficiencies or perform the cyclical maintenance needs
- Evaluate and compare needs, associated cost, and available funds
- Develop a list of maintenance repairs to be performed over a 5-year period
  - Priority is placed on bridges with safety concerns and bridge elements with condition ratings  $\leq 4$
- 5-year Maintenance Program is a working document that is updated year-to-year based on current condition and needs of existing bridge inventory.

- Typical Cyclical Maintenance Items include:
  - Bridge Washing & Bridge Painting
  - Deck Sealing & Overlays
  - Concrete Substructure Sealing
  - Crack Sealing
  - Bearing Lubrication
- Element Specific Deficiency Repairs or Replacement include:
  - Superstructure and Substructure Concrete Repairs
  - Steel Girder Repairs
  - Joint Replacement
  - Bearing Replacement
  - Curb Repairs & Replacement
  - Scour Protection
  - Railing Repairs & Upgrades
  - Drainage Improvements

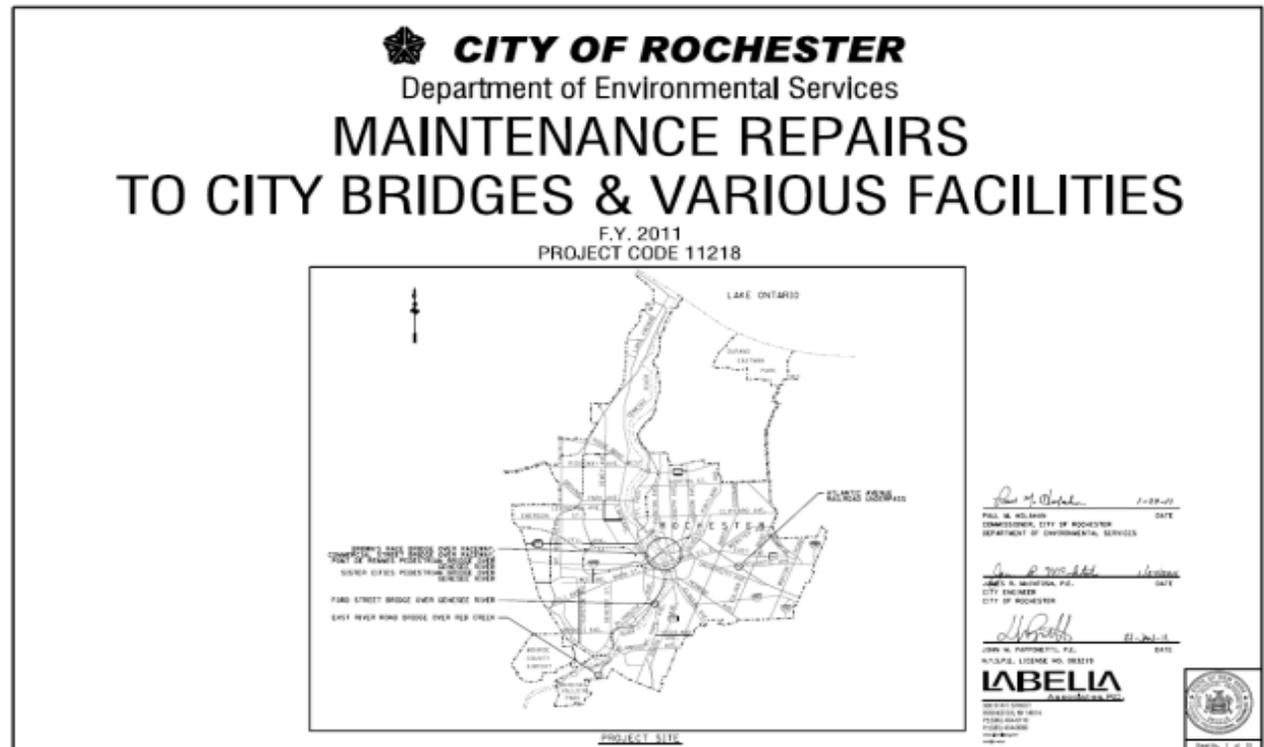


- Construction Documents (Year One of 5-year Plan)

- Plans & Details
- Specifications
- Proposal Book
- Engineer's Estimate

- Bid & Award

- Advertisement
- Pre-bid Meeting
- Bid Opening
- Bid Analysis
- Award Recommendation



- Construction Management & Inspection
  - Preconstruction Meeting
  - Progress Meetings
  - Shop Drawing Review
  - Pay Applications
  - Change Orders
  - Part-time Inspection
  - Record Plans

**CITY OF ROCHESTER D.E.S. CONSTRUCTION DIVISION**  
**APPLICATION AND CERTIFICATION FOR PAYMENT**

PROJECT: Maintenance Repairs to City Bridges and Various Facilities, FY 2010  
P.C.NO.: 08224  
CONTRACTOR: C.P. Ward, Inc. 100 River Road Scottsville, NY 14546  
OWNER: City of Rochester, D.E.S. 30 Church Street Rochester, NY 14614

SHARE: Bridge  
CONT. NO.: 115890  
PAYT NO.: Partial-06  
DATE: February 11, 2011  
PERIOD FROM: November 4, 2010  
PERIOD TO: February 11, 2011

Application is Made For Payment, As Shown Below in Connection With The Contract Continuation Sheet(s) Attached.

The Present Status Of The Account For This Contract Share is As Follows:

Original Share Sum:	\$ 158,980.00
Net Change By Change Order:	\$ 64,134.29
Contract Sum To Date:	\$ 223,114.29
Total Completed And Stored To Date:	\$ 221,139.29
Retainage:	LS \$ 100.00
Total Earned Less Retainage:	\$ 221,039.29
Amount Previously Paid (Deduct):	\$ 173,001.52
Current Payment Due:	\$ 48,037.77

APPROVED CHANGE ORDER SUMMARY

No.	Date	Addition	Deletion
1	13-Aug-10	\$ 18,478.00	
2	27-Aug-10	\$ 4,815.00	
3	10-Dec-10	\$ 40,941.29	
4			
5			
6			
7			
8			
9			
10			
Totals		\$ 64,134.29	
Net Totals		\$ 64,134.29	

THE UNDERSIGNED CONTRACTOR CERTIFIES THAT THE WORK COVERED BY THIS APPLICATION FOR PAYMENT HAS BEEN COMPLETED IN ACCORDANCE WITH CONTRACT DOCUMENTS, THAT ALL AMOUNTS WITH CONTRACT PAID BY HIM FOR WORK FOR WHICH PREVIOUS CERTIFICATES FOR PAYMENT WERE ISSUED AND PAYMENTS WERE RECEIVED FROM THE OWNER, AND THAT THE CURRENT PAYMENT SHOWN HEREIN IS NOW DUE.

Contractor's Authorized Representative: *[Signature]*  
By: \_\_\_\_\_  
Project Engineer: *[Signature]*  
Owner: \_\_\_\_\_

IN ACCORDANCE WITH THE CONTRACT AND THIS APPLICATION FOR PAYMENT THE CONTRACTOR IS ENTITLED TO PAYMENT IN THE AMOUNT SHOWN ABOVE

Date: 2/18/11

THIS CERTIFICATE IS NOT NEGOTIABLE, IT IS PAYABLE ONLY TO THE PAYEE NAMED HEREIN. ISSUANCE, PAYMENT, AND ACCEPTANCE ARE WITHOUT PREJUDICE TO ANY RIGHTS OF THE CONTRACTOR UNDER THEIR CONTRACT.

Date: 2/18/11

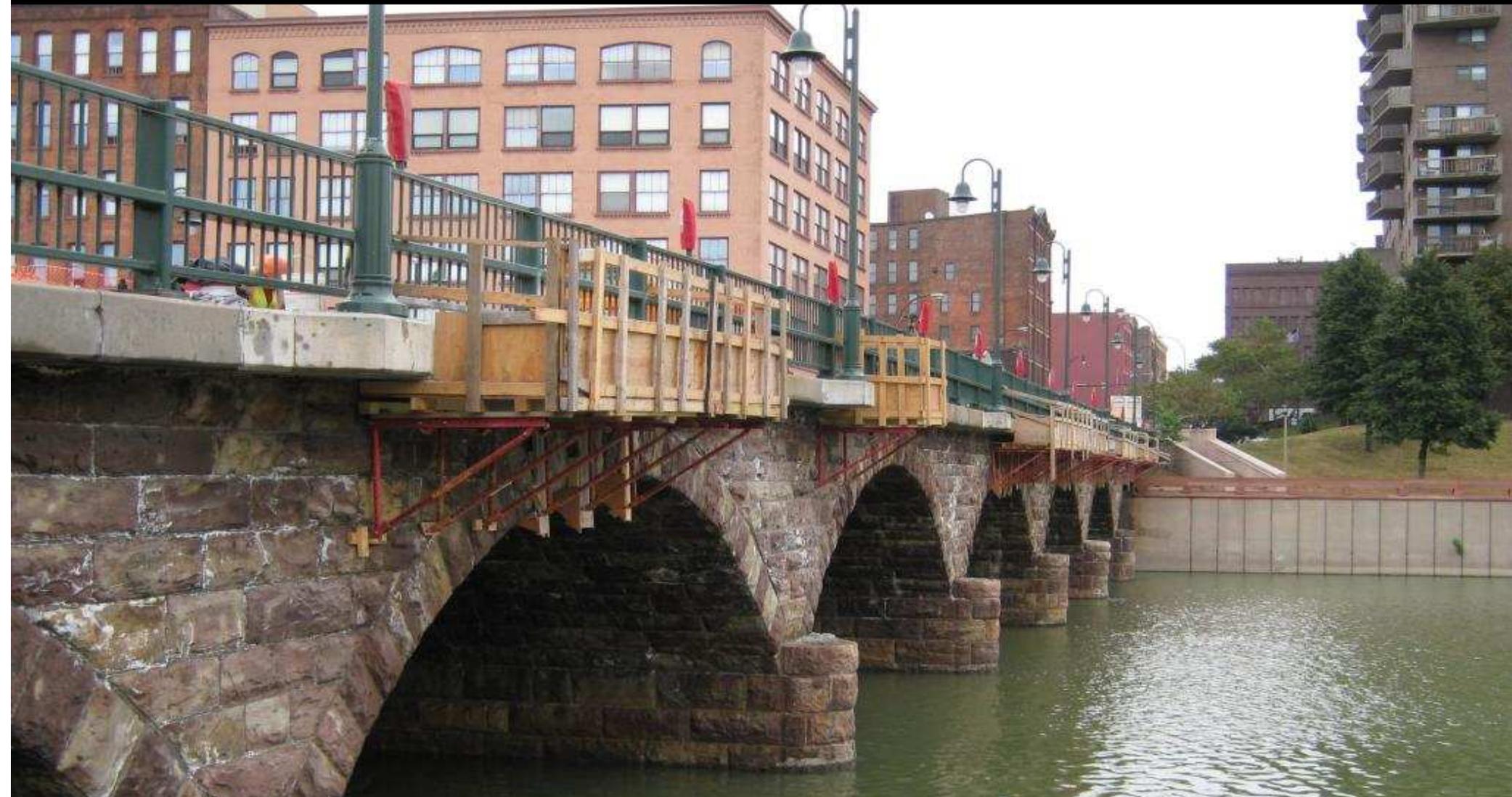
JOINT REPLACEMENT



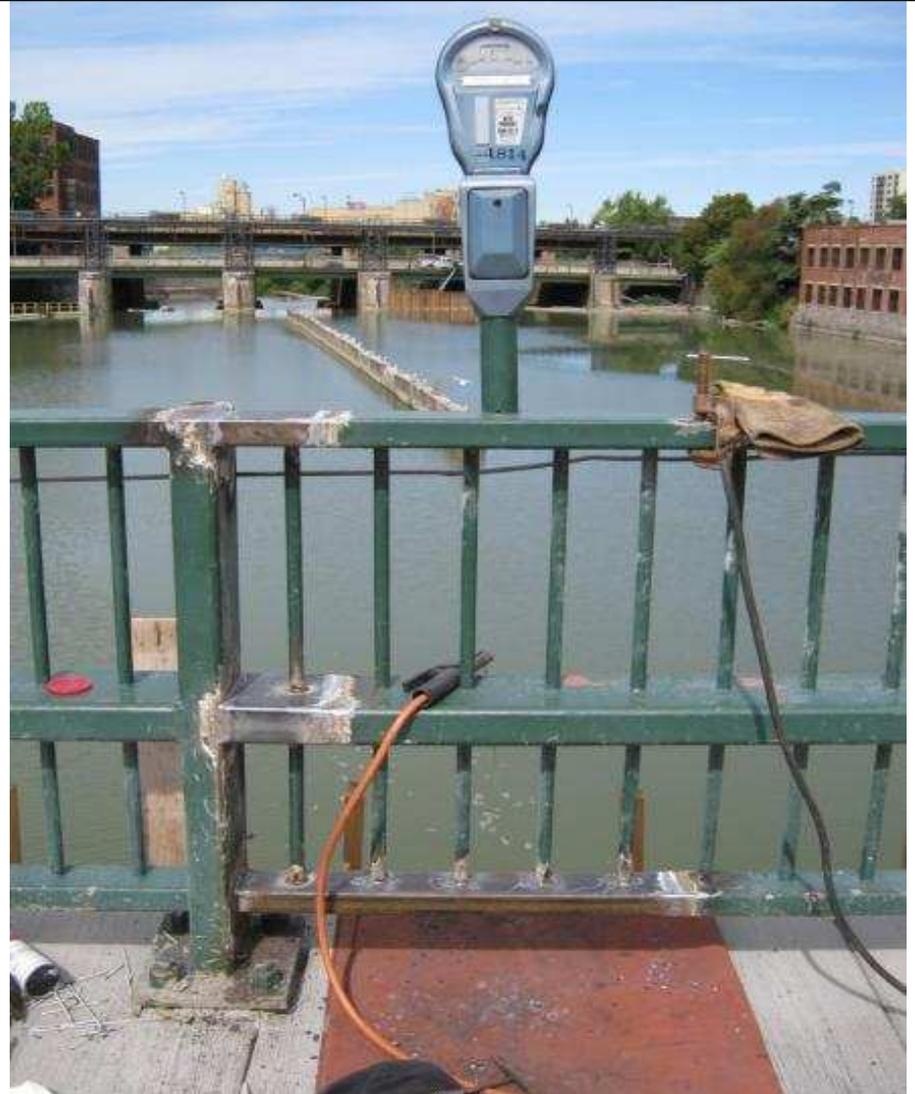
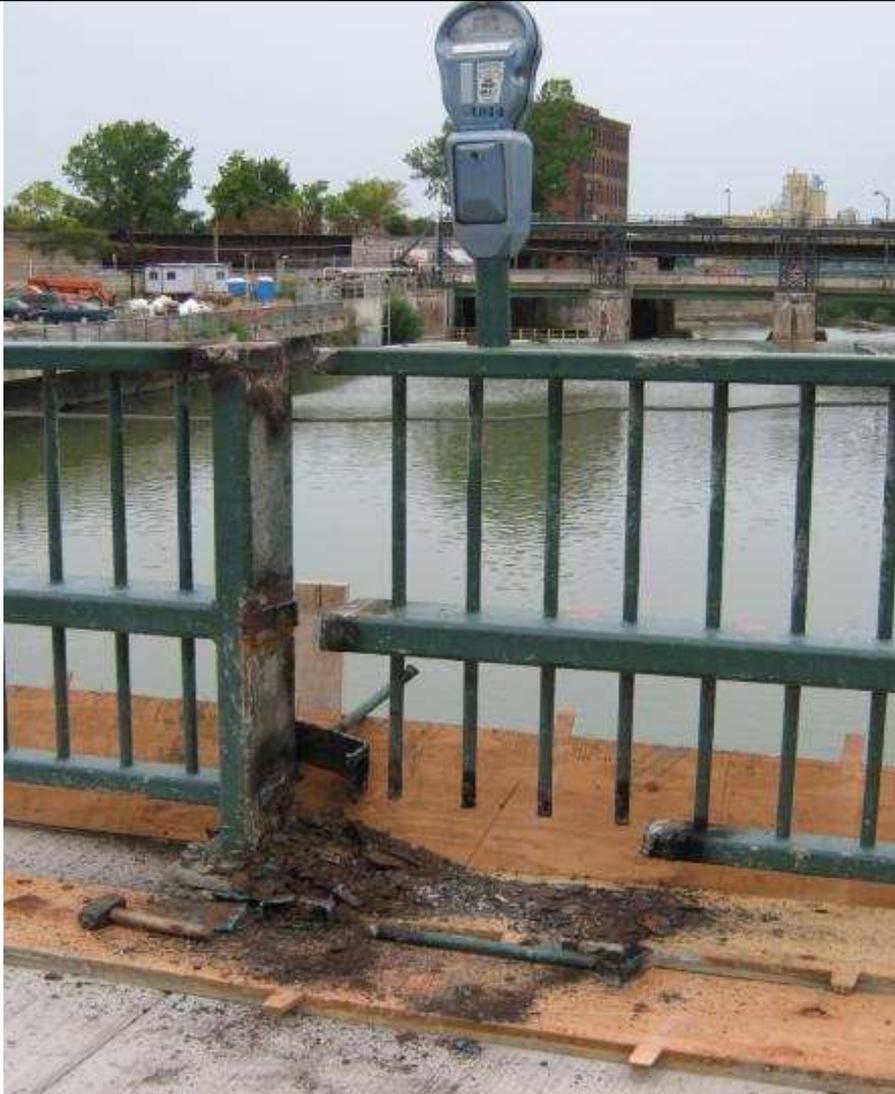
















**CURB REPLACEMENT**









CONCRETE SUBSTRUCTURE REPAIRS



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# QUESTION & ANSWER PERIOD



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