October 25, 2016

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATION
DEPARTMENT OF ADMINISTRATION

DIVISION OF PURCHASES BID NO. 7550996

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

RHODE ISLAND CONTRACT NO.2016-CB-064

FEDERAL-AID PROJECT NO. FAP Nos: BRO-0250(011)

0031N OLD SAKONNET RIVER BRIDGE DEMOLITION

Old RI Route 24 Station 182+66.50 to Station 204+45.21

CITY/TOWN OF Portsmouth, Tiverton

COUNTY OF NEWPORT

NOTICE TO PROSPECTIVE BIDDERS

ADDENDUM NO. 1 Prospective bidders and all concerned are hereby notified of the following changes in the Plans, Specifications, Proposal and Distribution of Quantities for this contract. These changes shall be incorporated in the Plans, Specifications, Proposal and Distribution of Quantities, and shall become an integral part of the Contract Documents.

A. Clarification

1. Pre-Bid Sign-In Sheets

   A copy of the Pre-Bid Sign-In sheets have been attached to this Addendum No. 1.

2. Navigation Channel Closures

   It is anticipated that the United States Coast Guard (USCG) will prohibit any closures of the navigation channel (below the main truss span) between Memorial Day and Labor Day. This will be addressed by the pending USCG permit, to be added by subsequent addendum.

B. Contract Dates

1. Bid-Opening Date

   The bid opening date has been revised to 12/16/2016.

2. Substantial Completion Date

   The substantial completion date has been revised to 05/25/2018.

C. Contract Documents

1. Page CS-i

   Remove Page CS-i in its entirety and replace it with revised Page CS-i (R-1) attached to this Addendum No. 1. Section 33, "Insurance Requirements", has been added.

ADDENDUM NO. 1
ATTACHMENTS

2. Pages CS-15 and CS-16

   Remove Page CS-15 in its entirety and replace it with revised Page CS-i (R-1) and new Page CS-16 attached to this Addendum No. 1. Section 32, "Maintenance of Marine Traffic", has been revised. Section 33, "Insurance Requirements", has been added.

3. CS Appendix C - Transportation Management Plan

   Remove Page 15 of 16 of the Transportation Management Plan in its entirety and replace it with revised Page 15 of 16 (R-1) attached to this Addendum No. 1. The TMP approval signatures have been added.

4. Page JS-2

   Remove Page JS-2 in its entirety and replace it with revised Page JS-2 (R-1) attached to this Addendum No. 1. The Design Consultant shop drawing contact information has been revised.

5. Page JS-7

   Remove Page JS-7 in its entirety and replace it with revised Page JS-7 (R-1) attached to this Addendum No. 1. The liquidated damages amount has been revised.

6. Page JS-19

   Remove Page JS-19 in its entirety and replace it with revised Page JS-19 (R-1) attached to this Addendum No. 1. The Description section has been revised to require temporary shielding for specific spans.

7. Page JS-29

   Remove Page JS-29 in its entirety and replace it with revised Page JS-29 (R-1) attached to this Addendum No. 1. The marine work zones limits have been revised.

8. Pages JS-31 and JS-31a

   Remove Page JS-31 in its entirety and replace it with revised Page JS-31 (R-1) and new Page JS-31a attached to this Addendum No. 1. The Materials and Construction Methods sections have been combined and revised.

D. Drawings/Plans - Change/Addition

1. Sheet 5 of 30

   Remove Sheet 5 in its entirety and replace it with revised Sheet 5 (R-1) attached to this Addendum No. 1. The Job Specific Plan Symbols, Legend & Notes have been revised.

2. Sheet 25 of 30

   Remove Sheet 25 in its entirety and replace it with revised Sheet 25 (R-1) attached to this Addendum No. 1. The Maintenance and Protection of Traffic Notes and PCMS Note have been revised. The temporary signs on the Shared Use Path have been moved to the other side of the path.

E. Additional Documents

1. Coating Evaluation Report

   The Coating Evaluation Report for the Old Sakonnet River Bridge has been added to the Contract Disk.

12.05.16

RI Department of Transportation

Administrator, Division of Project Management

ADDENDUM NO. 1

ATTACHMENTS

State of Rhode Island
Division of Purchases
One Capitol Hill
Providence, RI 02908

"NON-MANDATORY" PRE BID CONFERENCE SIGN IN SHEET

BID NUMBER:	7551000
BID TITLE:	2016-CB-064 Old Sakonnet River Bridge Demolition
PRE BID DATE & TIME:	October 13, 2016 @ 9:00 AM

Purchasing Representative: Lisa Ahl

Pre Bid START TIME:

Pre Bid END TIME:

PLEASE PRINT

	COMPANY NAME	COMPANY REPRESENTATIVE	ADDRESS	CONTACT E-MAIL	CONTACT PHONE NUMBER
1	WALSH	Keith Catanzaro	455 HAWMUT RD CANTON	KCATANZARO@WALSHGROUP.com	617 233 2904
2	RIDOT	Judy Richards	One Capitol Hill	Judy.Richards@dot.ri.gov	401-222-2023 x4216
3	RIDOT	NATHAN SHAPIRO	TWO Capitol Hill	NATHAN.SHAPIRO@DOT.RI.GOV	222-2023 x4405
4	MIG CORP	Gloux Loux	Acton Pl Acton MASS	GLOUX@MIGCORPORATION.com	978-844-0606
5	Commonwealth	Jim Onsko	400 Smith St Providence	JONSKO@COMMONWEALTH-ENG.com	401-273-600
6	S&R CORP	Tom Guerette	706 Broadway St Lowell, MA 01854	Tguerette@SandRcorp.com	978-441-2000
7	CARDI CORP	RAY GIORDANO	400 LINCOLN AVE WARWICK RI	ESTIMATING@CARDI.COM RGIORDANO@CARDI.COM	4017398300
8	SPECIALTY DIVING	GREG MAURER	192 SMITH STREET N. KINGSTOWN, RI 02852	GMAURER@SPECIALTYDIVING.com	401 295 5256
9	COMMONWEALTH ENGR.	NIKONE SOUPHARATH	400 SMITH ST. PROV. RI 02908	NSOUPHARATH@commonwealthreng.com	401-273-6600
10	"	MARK GREENLEAF	"	MGREENLEAF@	4012736602
11	ATLANTIC COAST DISMANTLING RALPH & MARCHAND	RALPH MARCHAND	63 SALEM TURNPIKE SAUGUS MA 01906	RALPH@ACDISMANTLING.com	781-460-8827
12	Barletta	Tom Day	40 Shawmut Rd. Ste 200 Canton, MA 02021	tday@barlettaco.com quotes@barlettaco.com	781-737-1733
13	Barletta	Chris Rocha	40 Shawmut Rd. Suite 200 Canton, MA 02021	crocha@barlettaco.com	781-737-1738
14	MANAFORT BROTHERS	Anthony Pagueza	414 New Britain Ave Plainville, CT	MBrandon@Manafort.com	(860)793-6415
15	Peter Bendo				

State of Rhode Island
Division of Purchases
One Capitol Hill
Providence, RI 02908

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PLEASE PRINT

	COMPANY NAME	COMPANY REPRESENTATIVE	ADDRESS	CONTACT E-MAIL	CONTACT PHONE NUMBER
16	JR Vinagro	Peter Beal	200 Plainville Rd Johnston RI	peterb@jrvinagrocorp.com	617-650-4078
17	JR Vinagro	Joe Pasquarella	2208 Plainfield Pike Johnston, RI	josephp@jrvinagrocorp.com	617-335-7400
18	North American Crane	Louis Izzo	33 Acorn St, Ste. 215 Providence RI 02903	lizzo@NACranes.com	401-485-2925
19	North American Crane	Pat Izzo	33 ACORN ST PROVIDENCE, RI 02903	pizzo@NACRANES.com	781-858-7777
20	Bisetto	Michael Bisetto	20 Development St Fall River, MA 02721	Mike B@Bisettocorp.com	508-679-0578
21	North American Crane	David White	33 Acorn Street Ste 215 Providence, RI 02903	dwhite@nacranes.com	401-230-4771
22					
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INDEX
SPECIAL PROVISIONS CONSTRUCTION GENERAL

32. MAINTENANCE OF MARINE TRAFFIC

General - The Contractor is advised that the Sakonnet River is a navigable waterway and must remain open to vessel traffic at all times, except as stipulated in the U.S. Coast Guard Bridge Permit. For all project activities not covered under that Permit, the Contractor shall be responsible for obtaining all necessary permits from the U.S. Coast Guard Office of Marine Safety. Any vessels or other floating equipment owned by the Contractor or his subcontractor(s) must be situated when in the navigation channel so that they can be cleared out of the channel upon an appropriate signal from vessels.

In coordination with RIDOT and the Contractor, the U.S. Coast Guard will establish a "Temporary Safety Zone" for this project, extending from the Tiverton shoreline to the Portsmouth shoreline north and south of the old Sakonnet River Bridge. Advisory of this Temporary Safety Zone will be disseminated by Local Notice to Mariners (LNM).

Unless otherwise allowed by the Coast Guard, all floating equipment shall be properly moored outside and clear of the navigation channel during non-working hours, and lighted in accordance with Coast Guard Regulations.

In order that radio communication may be made with passing vessels, all barges, tugs, etc. engaged in the work of this Contract shall be equipped with bridge-to-bridge radio telephone equipment.

Navigational Lighting and Markers - The Contractor shall provide and maintain all navigational lighting and other navigation signals or facilities as may be required by the Coast Guard on all temporary structures and vessels. He shall also ensure the continuous operation of navigational lighting on the old Sakonnet River Bridge in accordance with the requirements of **Code 926.9903 – Navigational Lighting for Existing Bridge Piers.**

33. INSURANCE REQUIREMENTS

The Contractor shall procure and maintain, at its own expense during the life of the Contract, insurance in the kinds and in the amounts specified herein, with insurance companies authorized to do business in the Rhode Island and otherwise acceptable to the State. The insurance shall cover all work under this Contract, whether performed by the Contractor or by a subcontractor. Before commencing the work, the Contractor shall furnish certificates of insurance and endorsements in forms satisfactory to the State as evidence of the Contractor's compliance with the requirements of this article, and certifying that the policies will not be cancelled or not renewed until thirty days after the State receives notice of such cancellation or non-renewal. The State reserves the right to request certified copies of policies. Failure to maintain the required insurance shall be a material breach of this Contract. The types of required insurance are:

a. Statutory Workers' Compensation and Employers' Liability insurance for all of the Contractor's employees engaged in work under this Contract, and, in case any such work is subcontracted, the Contractor shall require such subcontractors similarly to provide Workers' Compensation and Employers' Liability insurance for all of the subcontractors' employees engaged in such work. The Contractor shall have the policy endorsed for the following additional coverages as applicable:

1. United States Longshoremen's and Harbor Workers' Compensation Act Endorsement.
2. Coverage B Endorsement - Maritime (Masters or Members of the Crew of Vessels), in limits of not less than $1,000,000.
3. The Contractor shall have the policy endorsed to provide for a waiver of subrogation against the State and its consultants. The Contractor will provide the State with a waiver of subrogation endorsement complying with this requirement.

b. Commercial General Liability insurance with limits of liability in the amount of $1,000,000 combined single limit for bodily injury and property damage liability per occurrence, and $10,000,000 general aggregate. The Contractor shall have the policy endorsed for the following additional coverages:

1. XCU (explosion, collapse, and underground hazards).
2. Ownership, maintenance, operation, use, loading, and unloading of watercraft.
3. The State and its consultants for the project are included as additional insured as stipulated on an endorsement to be provided to the State.

c. Business Automobile Liability insurance with limits of liability in the amount of $1,000,000 combined single limit for bodily injury and property damage liability per accident. The Contractor shall have the policy endorsed for the following additional coverages:

1. The State and its consultants for the project are included as additional insured as stipulated on an endorsement to be provided to the State.
2. Covering the Contractor or its subcontractor who transports any hazardous waste or materials from the project site if such transportation requires a hazardous waste manifest, coverage for bodily injury and property damage liability, including liability for environmental restoration resulting from negligence in the operation, maintenance, or use of any motor vehicle involved in transportation of hazardous waste pursuant to all federal, state, and local laws, rules, and regulations. An MCS-90 endorsement must be attached to the policy and supplied on primary basis with a $5,000,000 limit of liability. The Contractor shall also furnish evidence to the State that the disposal facility chosen for the deposit of such hazardous waste or materials has the minimum Environmental Liability Insurance required by applicable federal, state, and local statutes and regulations.

d. Excess Liability insurance with limits of liability in the amount of $10,000,000 combined single limit for bodily injury and property damage liability per accident. The Contractor shall have the policy endorsed for the following additional coverages:

1. The State and its consultants for the project are included as additional insured as stipulated on an endorsement to be provided to the State.
2. The Excess Liability insurance shall provide excess limits with respect to Commercial General Liability, Business Automobile Liability, and Employers' Liability insurance required to be maintained by the Contractor.

e. Environmental Liability Insurance in the amount of $5,000,000 combined single limit for bodily injury and property damage liability per occurrence and aggregate. Such insurance shall provide coverage with respect to any operation of the Contractor or any of its subcontractors required under or incidental to the performance of the Contract, including, but not limited to, treating, handling, or disposing of asbestos, asbestos containing materials, asbestos contaminated materials, lead paint, petroleum, petroleum constituents, and all other environmentally regulated substances and hazardous materials. If it appears that the aggregate limit of the policy will be exceeded, replacement insurance will be required. This insurance may be supplied by the subcontractor performing the work, if the Contractor is not performing any of the relevant work, and if the Contractor, the State and its consultants are included as additional insured as stipulated on an endorsement to be provided to the Contractor and the State. The Contractor shall have the policy endorsed for the following additional coverages:

1. The State and its consultants for the project are included as additional insured as stipulated on an endorsement to be provided to the State.

CHANGES TO TMP & CONTINGENCY PLANS

If at any time (1) a significant deviation from any of the strategies included in the TMP (e.g., the use of an alternate construction sequence) is desired by one or more members of the project implementation team, (2) field observations and/or data suggest that impacts to road users are or will be unacceptable, or (3) one or more performance requirements established in the TMP are not being met in the field, the RIDOT TMP Implementation Manager shall report the situation to his/her supervisor or Division/Section/Unit manager. The supervisor / manager will coordinate with the State Traffic Engineer, the Manager of Project Management, the TMP Development and/or Implementation Manager(s), the Chief Engineer, and/or other interested parties as appropriate and/or necessary to consider and determine whether revised and/or alternate strategies should be implemented in an effort to lessen the adverse safety and/or mobility impacts of the project. If the supervisor / manager deems that strategy changes should be implemented, the changes shall be documented in a revised version of the TMP and the Manager of Project Management, the State Traffic Engineer, and the Chief Engineer must approve of the revised TMP prior to their implementation.

If a significant deviation from any of the strategies included in the TMP is requested by the Contractor, unless directed otherwise by the RIDOT the Contractor is responsible for preparing and submitting to the RIDOT TMP Implementation Manager appropriate documentation (e.g., design calculations, analysis reports, Temporary Traffic Control Plans, etc.) showing that the requested change(s) are (1) feasible and (2) expected to result in safety and mobility impacts that are no more adverse than the impacts resulting from the strategies already included in the latest approved TMP. The RIDOT will review and consider the submittal(s) as described in the preceding paragraph and will determine whether the changes should be implemented. If the requested changes are approved by the RIDOT, unless otherwise directed by the RIDOT the Contractor shall prepare and submit to the RIDOT TMP Implementation Manager a revised version of the latest approved TMP in both printed and electronic (Microsoft® Excel) format that documents all of the approved changes. Work to implement the changes shall not begin until the Manager of Project Management, the State Traffic Engineer, and the Chief Engineer have approved of the revised TMP.

When unexpected events (e.g., crashes, inclement weather, unforeseen traffic demands, etc.) occur in a project work zone where one or more lanes are closed, the RIDOT TMP Implementation Manager or his/her responsible designee should (1) determine whether or not the lane closure(s) can/should be removed in order to improve traffic operations and/or minimize delays and (2) if deemed appropriate, take action to remove the lane closure(s).

Project Specific Contingencies

TMP APPROVALS

All approvals must be obtained prior to start of work.

MANAGER, PM

Signature: Joseph Baker, PE

Date: 9.27.2016

Revision #	Initials	Date

STATE TRAFFIC ENGINEER

Signature: Robert Rocchio, P.E.

Date: 9-28-16

Revision #	Initials	Date

CHIEF ENGINEER

Signature: David W. Fish

David Fish, PE

Date: 9-29-16

Revision #	Initials	Date

CODE 105.02
PLANS AND SHOP DRAWINGS

Unless otherwise modified elsewhere in the Contract Documents, Section 105.02 of the Rhode Island Standard Specifications is revised as follows:

Delete Subsection **105.02 PLANS AND SHOP DRAWINGS** in its entirety and replace with the following:

105.02 PLANS AND SHOP DRAWINGS. Plans will show details of all structures, lines, grades, typical cross sections of the roadway, location and design of all structures and a summary of items appearing on the Proposal. Bridge plans will either show all dimensions and details necessary for complete construction or such information that when supplemented by additional field data gathered by the Contractor will enable the Contractor to prepare complete shop drawings.

The Contractor shall keep one set of Plans available at the site at all times, and shall provide approved shop drawings to the Engineer upon request.

All shop drawings shall be submitted in a timely fashion such that the Contractor's accepted schedule will not be adversely impacted by the submittal process. Shop drawings shall consist of such detailed plans and associated information as required to control the work that are not included in the Plans furnished by the Department. They shall include, but not be limited to, erection plans, falsework plans, formwork plans, sheeting plans, cofferdam plans, bending diagrams for reinforcing steel, computations, stress sheets, manufacturer's data or any other supplementary plans or similar data required of the Contractor to control the work. All shop drawings submittals shall be complete, incorporating all associated components of work affecting the item for which the shop drawing is submitted. The Contractor is solely responsible for the completeness of all submissions. Incomplete shop drawings will be returned to the Contractor for resubmission.

The Contractor shall submit eight (8) sets of shop drawings, two (2) of which shall be sent simultaneously to the Design Consultant. Shop drawings shall be accompanied by eight (8) sets of design computations, cuts from manufacturers' catalogs, and/or all other supporting technical bulletins and data. The submission to the Design Consultant shall by courier or overnight delivery. The Design Consultants for this project are:

Commonwealth Engineers & Consultants, Inc.
400 Smith Street
Providence, Rhode Island 02908
Attention: Mr. Jim Onysko, P.E.
Phone: 401–273-6600 x107
Office Hours: 8:00 AM – 4:30 PM

CODE 108.1000
PROSECUTION AND PROGRESS

In accordance with Section 108.08, Failure to Complete on Time, Para. a., Phased Completion, Interim Completion and Substantial Completion the following defines the Interim and Substantial Completion Dates and Associated Liquidated Damages:

Substantial Completion: **May 25, 2018**

All Contract work shall be completed, as defined by Section 101.71.

Liquidated Damages: $2,650.00 per calendar day.

CODE 803.99
UNDER-DECK PROTECTION

DESCRIPTION:

The Contractor shall provide under-deck protection, comprising debris netting and/or temporary deck underside protective shielding, under all areas of bridge deck removal, all in accordance with the Contract Documents and these Special Provisions, and as directed by the Engineer. Temporary shielding is required for spans 1, 2, 3, 11, 12, 13, 14, and 15. For other spans, the Contractor may use a combination of debris netting and temporary shielding at his discretion, provided that all areas to be protected conform to the requirements of this specification and all other contract documents. Where netting is used, the Contractor provide all necessary means to redirect boat and pedestrian traffic away from areas beneath the work during demolition operations as part of this item.

The under-deck protection shall prevent any debris, tools, materials and other items from falling to the ground or water, provide for the safe passage of vehicles, marine vessels, pedestrians, marine traffic and provide protection for utilities and the environment. The use of this under-deck protection is mandatory.

MATERIALS AND CONSTRUCTION METHODS:

The under-deck protection shall be furnished, installed, and maintained in accordance with the Contractor's approved Final Demolition Plan. The submitted Demolition Plan shall include shop drawings and narrative detailing the proposed implementation of this Item over the duration of the Contract. This under-deck protection shall be installed and in place prior to engaging in deck demolition operations.

This under-deck protection shall be capable of supporting the weight of falling items (as mentioned above) and furthermore be appropriately sized to contain the items and prevent them from falling to the ground or water below.

Debris Netting

The materials and installation shall conform to ANSI A.10.11, "American National Standard for Construction and Demolition Operations - Personnel and Debris Nets." The netting must have a minimum working rating of not less than 13,560 N-m (10,000 ft.-lb.), and be designed to hold the minimum anticipated weight of debris. The netting shall be cleared of debris as needed to prevent loads in excess of its rating.

The netting shall be capable of a minimum service life of two years under normal on-the-job exposure to weather, sunlight, and handling. Any damages to the netting due to misuse, mishandling, exposure to chemicals, airborne contaminants and/or falling items shall be repaired by the Contractor at no expense to the Department.

CONSTRUCTION METHODS:

Marine Work Zone. Prior to the commencement of demolition operations within or above the Sakonnet River, the U.S. Coast Guard will establish a "Temporary Safety Zone" along the corridor of the Old Sakonnet River Bridge between the shorelines of Portsmouth and Tiverton. The Contractor's marine work zones shall be established within this Temporary Safety Zone. Physical delineation of the marine work zone shall consist of a perimeter of buoys, spaced at even intervals with a distance approved by the US Coast Guard and the Engineer, but no greater than two hundred (200) feet between adjacent buoys, completely enclosing the work zones within the Sakonnet River during superstructure demolition, removal, and/or retrieval operations.

The perimeter of marine work zones shall run parallel to the new Sakonnet River Bridge and old Sakonnet River Bridge, at offset distances not to exceed 150 feet north (or to the causeway) of the old bridge and 150 feet south of the new bridge.

Under no circumstances shall the marine work zone(s) extend beyond the established Temporary Safety Zone, and buoys shall not be placed within the navigational channel (between Piers 10 and 11 of the old bridge and between Piers 5 and 6 of the new bridge) unless directed by the Engineer or the U.S. Coast Guard.

Buoys, lighting and signage delineating the marine work zones shall be in place for the duration of removal operations over water, both during and between periods of active work. In order that the main channel be reopened as quickly as possible following the start of operations in and over the Sakonnet River, the Contractor shall adjust the marine work zones to enclose only the current areas of active operations as directed by the Engineer or the U.S. Coast Guard. As bridge superstructure removal operations proceed away from the navigational channel, or where changed conditions warrant, buoys, lighting and signage shall be removed and/or relocated as appropriate.

The Contractor shall maintain all buoys (including mooring and anchoring), lighting, and all signage for marine work zone delineation in a sturdy, clean, and legible condition. In this regard "maintenance" involves the following: repairing; adjusting; and cleaning. Buoys, lighting, and signage shall also be replaced as necessary.

Lighting shall be illuminated on all buoys delineating the marine work zone(s) between sunset and sunrise, during periods of reduced visibility (e.g., fog), and as directed by the Engineer or U.S. Coast Guard. This lighting shall be provided for the duration of operations within or above the Sakonnet River and shall be in accordance with the rules and regulations of the United States Coast Guard (including all applicable sections of Title 33 CFR - Navigation and Navigable Waters and the Maritime Transportation Security Act of 2002).

CODE 926.9903
NAVIGATIONAL LIGHTING FOR EXISTING BRIDGE PIERS

DESCRIPTION:

The work under this item shall consist of the design, fabrication, and installation of solar powered pier navigation light systems, including four pier markers installed at the locations indicated on the plans. Lighting shall be in accordance with the rules and regulations of the United States Coast Guard (including all applicable sections of Title 33 CFR - Navigation and Navigable Waters and the Maritime Transportation Security Act of 2002), in accordance with the Contract Documents and as directed by the Engineer.

MATERIALS AND CONSTRUCTION METHODS:

Navigation light fixtures, solar generator units, battery units, and all other components shall meet all US Coast Guard requirements, conform to all applicable codes and regulations, and shall be designed to operate as fully integrated outdoor marine lighting systems.

As part of the Contractor's Conceptual and Final Demolition Plans, the Contractor shall submit for approval complete shop drawings of the system design, including literature and maintenance instructions for all components. The design shall be prepared by an RI registered engineer.

The Contractor shall assemble a maintenance manual for the systems. The manual shall consist of all product submittals, a breakdown of parts available for the products, the manufactures name, address and phone number and a list of recommended spare parts.

The Navigation light system shall conform to the following:

1. Lights shall be solar powered, and capable of operating for a minimum of 20 consecutive days without sunlight.
2. Light fixtures shall be LED, 180 degree red, with a minimum lamp capacity of 18,000 hours.
3. Systems shall be designed so that failure of a single solar power component does not disable the system.
4. Systems shall be regulated to prevent overcharging of the batteries.
5. Systems shall include a display indicating the operating status of the power components, and the battery charge level of the battery unit.
6. Systems shall be designed so that maintenance personnel, during the course of duties, will not be exposed to electrically live parts.
7. System components shall be watertight, weatherproof and vandal resistant.
8. Systems shall be capable of being locked in the normal operating position and maintained from the top surface of the piers. The Contractor shall supply an

approved lock for each navigation light system, keyed to the standard supplied by the Region, or owner.

9. Systems shall be installed by means of steel corrosion-resistant bolts and fasteners.

There shall be no interruption in lighting throughout the project duration. This item includes the removal and disposal of existing lights on the piers where the new lights are to be installed.

As part of the work, the Contractor shall guarantee the satisfactory operation of the light systems for a period of six months, measured from the date of substantial completion.

METHOD OF MEASUREMENT:

This item will not be measured for payment.

BASIS OF PAYMENT:

"ITEM CODE 926.9903 "NAVIGATIONAL LIGHTING FOR EXISTING BRIDGE PIERS" will be paid for at the contract unit price per "Lump Sum" as listed in the Proposal. The price so-stated will constitute full and complete compensation for all labor, materials, tools, equipment, and all incidentals required to finish the work as described in this Special Provision and elsewhere in the Contract Documents, complete in place and accepted by the Engineer.

Partial payments for this Lump Sum item will be made in accordance with Special Provision Code 109.07.

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	RI			5	30

R-1

JOB SPECIFIC LEGEND

CFS	COMPOST FILTER SOCK
RSGC	RESET STOCKPILED GRANITE CURB
M	PLACEMENT OF MILLING BENEATH GUARDRAIL
P-1	4" – CLASS 12.5 HMA 8" GRAVEL BORROW SUBBASE COURSE
P-2	3" – CLASS 12.5 HMA VARIES (8" MIN.) – GRAVEL BORROW SUBBASE COURSE
R&D	REMOVE & DISPOSE
R&R	REMOVE & RESET
RDS	REMOVE AND DISPOSE SHRUBS
S-1	CUTTING AND MATCHING ASPHALT, REFER TO R.I. STD. 47.1.1 (932.0100)
S-2	CUTTING AND MATCHING CONCRETE (932.0101)
S-3	FULL DEPTH SAWCUT OF BITUMINOUS PAVEMENT (932.0200)
SCCB	SEDIMENTATION CONTROL – CATCH BASIN

1

200' CRMC JURISDICTIONAL AREA

LEGEND

	RIDOT APPROVED TEMPORARY SIGN SUPPORT
40.5.0	UNACHORED PRECAST CONCRETE BARRIER FOR TEMPORARY TRAFFIC CONTROL STD. 40.5.0
26.1.0	FLUORESCENT TRAFFIC CONES STD. 26.1.0
26.2.0	POLYETHYLENE DRUM BARRICADE WITH MARKINGS STD. 26.2.0 (923.0105). THE MAXIMUM SPACING IS SHOWN ON THE PLANS. A CLOSER SPACING THROUGH THE WORK SPACE MAY BE NEEDED AS DIRECTED BY THE ENGINEER.
26.3.0	PLASTIC PIPE BARRICADE STD. 26.3.0
AP	ADVANCE WARNING ARROW PANEL
SABM	SHOCK ABSORBING BARRIER MODULES
	FLAGGER
	WORK SPACE
	TRUCK MOUNTED ATTENUATOR WITH FLASHING ARROW BOARD (928.0800)
	POLICE VEHICLE WITH FLASHING LIGHT BAR

JOB SPECIFIC GENERAL NOTES:

1. ANY SUBCONTRACTOR EMPLOYED BY THE CONTRACTOR AND R.I.D.O.T. PERSONNEL ON THIS PROJECT SHALL WORK WITHIN THE SAME PROTECTED WORK AREAS AS THE CONTRACTOR. NO SEPARATE LANE CLOSURES WILL BE PAID FOR.
2. TOPOGRAPHIC CONDITIONS ARE OBTAINED FROM AERIAL PHOTOGRAMMETRY. ACCURACY OF INFORMATION IS WITHIN ONE–HALF FOOT.

JOB SPECIFIC DRAINAGE AND EROSION CONTROL NOTES:

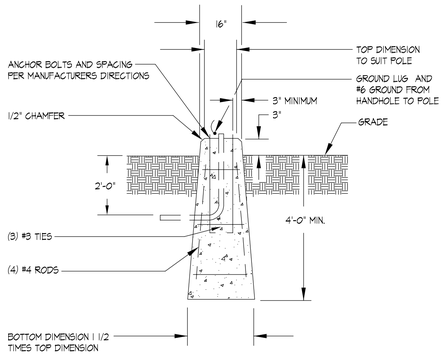
1

1. NOTE DELETED
2. NOTE DELETED
3. NOTE DELETED
4. NOTE DELETED
5. NOTE DELETED
6. FOR ALL PROJECTS WITH AT LEAST ONE(1) ACRE OF SOIL DISTURBANCE. R.I.D.O.T. IS REQUIRED TO DEVELOP AND ENFORCE A SITE SPECIFIC SOIL EROSION AND SEDIMENTATION CONTROL (SESC) PLAN IN ORDER TO REMAIN IN COMPLIANCE WITH THE RIPDES GENERAL PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL READ, BECOME FAMILIAR WITH, AND ADHERE TO ALL OF THE PROVISIONS, CONDITIONS, AND STIPULATIONS OF THE GENERAL PERMIT AND THE SITE SPECIFIC SESC FOR THIS PROJECT. COPIES OF THESE DOCUMENTS ARE INCLUDED IN THE PROJECT SUPPLEMENTAL DVD. ALL COSTS ASSOCIATED WITH ADHERENCE TO THE SWPPP SHALL BE CONSIDERED INCIDENTAL TO THE CONSTRUCTION AND INCLUDED WITH THE COST FOR THE ASSOCIATED BID ITEM(S).

1

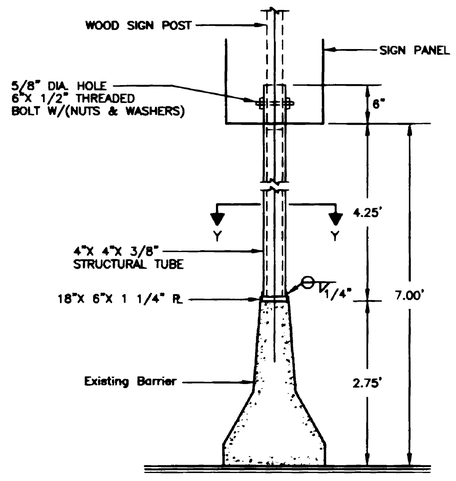
JOB SPECIFIC PLAN SYMBOLS

EXISTING		PROPOSED
○ GCS	GAS CURB STOP	● GCS
○ WCS	WATER CURB STOP	● WCS
○ HH	ELECTRIC HANDHOLE	⊠ HH
○ SHH	SIGNAL HANDHOLE	□ SHH
	UTILITY TEST PIT (SEE SUBSURFACE UTILITY PLANS)	TP–32
	PAVEMENT CORE	PC–X–X



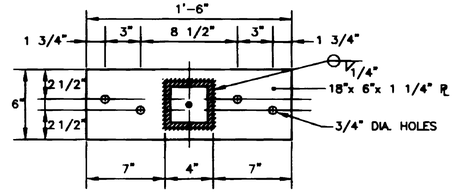
12FT. LIGHT STANDARD BASE DETAIL

NOT TO SCALE

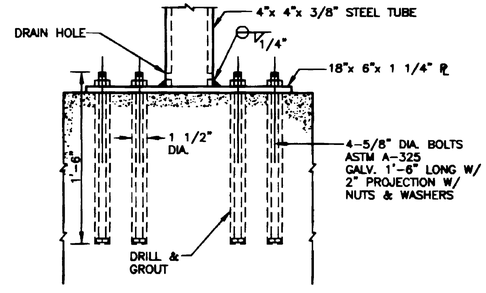


DETAIL-TEMPORARY CONSTRUCTION SIGN MOUNTING ON MEDIAN BARRIER

NOT TO SCALE



SECTION Y-Y



ELEVATION

ADDENDUM No. 1

CEC# 03062.00

COMMONWEALTH
ENGINEERS & CONSULTANTS, INC.
400 SMITH STREET
PROVIDENCE, RI 02908

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

REVISIONS			REVISIONS		
NO.	DATE	BY	NO.	DATE	BY
1	10–18–16	NS			

DESIGNED BY: DATE:
CHECKED BY: DATE:
SCALE: NONE

BRIDGE DEMOLITION
OLD SAKONNET RIVER BRIDGE NO. 250
PORTSMOUTH / TIVERTON RHODE ISLAND

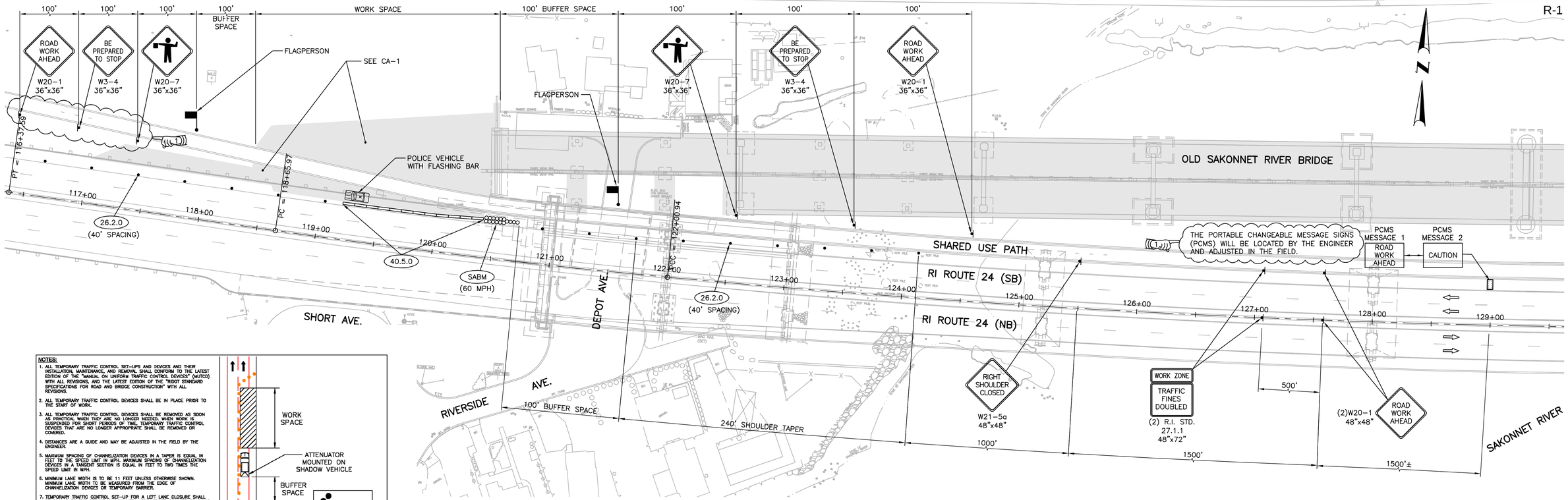
JOB SPECIFIC
PLAN SYMBOLS, LEGEND & NOTES

SHEET DESIGNATION
G-4

0031N_V1_005_JSNOTSYM001_ADD01

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	RI			25	30

R-1



ROUTE 24 SOUTHBOUND SHOULDER CLOSURE

SCALE: 1"=40'

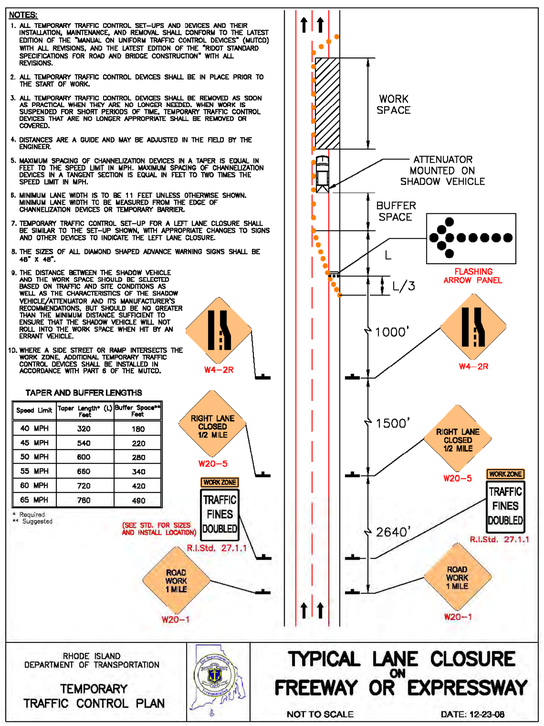
NOTES:

1. ALL TEMPORARY TRAFFIC CONTROL SET-UPS AND DEVICES AND THEIR INSTALLATION, MAINTENANCE, AND REMOVAL SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) WITH ALL REVISIONS, AND THE LATEST EDITION OF THE "RIDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" WITH ALL REVISIONS.
2. ALL TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF WORK.
3. ALL TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE REMOVED AS SOON AS PRACTICAL WHEN THEY ARE NO LONGER NEEDED. WHEN WORK IS SUSPENDED FOR SHORT PERIODS OF TIME, TEMPORARY TRAFFIC CONTROL DEVICES THAT ARE NO LONGER APPROPRIATE SHALL BE REMOVED OR COVERED.
4. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
5. MAXIMUM SPACING OF CHANNELIZATION DEVICES IN A TAPER IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH. MAXIMUM SPACING OF CHANNELIZATION DEVICES IN A TANGENT SECTION IS EQUAL IN FEET TO TWO TIMES THE SPEED LIMIT IN MPH.
6. MINIMUM LANE WIDTH IS TO BE 11 FEET UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF CHANNELIZATION DEVICES OR TEMPORARY BARRIER.
7. TEMPORARY TRAFFIC CONTROL SET-UP FOR A LEFT LANE CLOSURE SHALL BE SIMILAR TO THE SET-UP SHOWN, WITH APPROPRIATE CHANGES TO SIGNS AND OTHER DEVICES TO INDICATE THE LEFT LANE CLOSURE.
8. THE SIZES OF ALL DIAMOND SHAPED ADVANCE WARNING SIGNS SHALL BE 48" X 48".
9. THE DISTANCE BETWEEN THE SHADOW VEHICLE AND THE WORK SPACE SHOULD BE SELECTED BASED ON TRAFFIC AND SITE CONDITIONS AS WELL AS THE CHARACTERISTICS OF THE SHADOW VEHICLE/ATTENUATOR AND ITS MANUFACTURER'S RECOMMENDATIONS, BUT SHOULD BE NO GREATER THAN THE MINIMUM DISTANCE SUFFICIENT TO ENSURE THAT THE SHADOW VEHICLE WILL NOT ROLL INTO THE WORK SPACE WHEN HIT BY AN ERRANT VEHICLE.
10. WHERE A SIDE STREET OR RAMP INTERSECTS THE WORK ZONE, ADDITIONAL TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH PART 6 OF THE MUTCD.

TAPER AND BUFFER LENGTHS

Speed Limit	Taper Length* (L) Feet	Buffer Space** Feet
40 MPH	320	180
45 MPH	540	220
50 MPH	600	280
55 MPH	660	340
60 MPH	720	420
65 MPH	780	480

* Required
** Suggested



RHODE ISLAND DEPARTMENT OF TRANSPORTATION

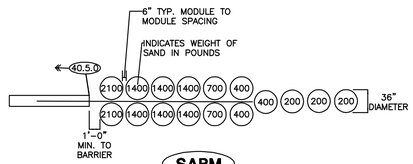
TEMPORARY TRAFFIC CONTROL PLAN

TYPICAL LANE CLOSURE ON FREEWAY OR EXPRESSWAY

NOT TO SCALE DATE: 12-23-06

LEGEND

- RIDOT APPROVED TEMPORARY SIGN SUPPORT
- ADVANCE WARNING ARROW PANEL
- 26.1.0 — FLUORESCENT TRAFFIC CONES R.I. STD. 26.1.0
- 26.2.0 — POLYETHYLENE DRUM BARRICADE WITH MARKINGS STD. 26.2.0
- 26.3.0 — PLASTIC PIPE BARRICADE STD. 26.3.0
- POLICE VEHICLE WITH FLASHING BAR
- PORTABLE CHANGEABLE MESSAGE SIGN
- DIRECTION OF TRAFFIC FLOW
- FLAGPERSON
- WORK SPACE



SABM

TYPICAL DETAIL
SHOCK ABSORBING BARRIER MODULES
60 MPH DESIGN VELOCITY
FOR ROUTE 24

NOT TO SCALE

MAINTENANCE AND PROTECTION OF TRAFFIC NOTES:

1. ALL TRAFFIC CONTROL DEVICES AND TEMPORARY TRAFFIC CONTROL ZONE ACTIVITIES SHALL MEET THE REQUIREMENTS OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) 2009 EDITION AND ALL REVISIONS.
2. TEMPORARY GUIDE SIGNS, DIRECTIONAL SIGNS, AND ROUTE SIGNS USED IN TEMPORARY TRAFFIC CONTROL ZONES SHALL HAVE A BLACK LEGEND AND BORDER ON AN ORANGE BACKGROUND.
3. TEMPORARY CONSTRUCTION SIGNS AND BARRICADES SHALL BE IN PLACE PRIOR TO THE START OF WORK.
4. ALL SIGNS AND BARRICADES ARE TO BE PLACED AND RELOCATED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
5. CONES SHALL ONLY BE USED WHEN A TRAFFIC CONTROL SET-UP IS USED DURING WORKING HOURS AND IT IS SUBSEQUENTLY BROKEN DOWN AT THE END OF THE WORK DAY.
6. SIGN MOUNTINGS SHALL BE IN ACCORDANCE WITH THE R.I. SPECIFICATIONS FOR TEMPORARY CONSTRUCTION SIGNS.
7. TEMPORARY CONSTRUCTION SIGNS SHALL BE REMOVED OR COVERED WHEN WORK IS NOT TAKING PLACE.
8. NOTE DELETED
9. POLICE DUTY OFFICERS AND FLAGPERSONS SHALL BE ACTIVELY ENGAGED IN DIRECTING TRAFFIC, PEDESTRIANS AND COORDINATION OF CONSTRUCTION EQUIPMENT ACCESS AT ALLL TIMES.

ADDENDUM No. 1

CEC# 03062.00

COMMONWEALTH ENGINEERS & CONSULTANTS, INC.
400 SMITH STREET
PROVIDENCE, RI 02908

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS			REVISIONS		
NO.	DATE	BY	NO.	DATE	BY
1	10-18-16	NS			

DESIGNED BY: DATE:
CHECKED BY: DATE:
SCALE: 1"=40'

BRIDGE DEMOLITION
OLD SAKONNET RIVER BRIDGE NO. 250
PORTSMOUTH / TIVERTON RHODE ISLAND

MAINTENANCE AND PROTECTION OF TRAFFIC PLAN NO. 1

SHEET DESIGNATION: MPT-1

0031N_V1_025_TCONTROL001_ADD01

KTA-Tator, Inc.

Coating Evaluation
Sakonnet River Bridge
Tiverton-Portsmouth
Rhode Island

Prepared for:

Mr. Vartan Sahakian
Commonwealth Engineering & Consultants, Inc.
206 West Exchange Street
Providence, Rhode Island 02903

Prepared by:

David S. Leyland
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80 Maynard Road
Brooklyn, Connecticut 06234
(860) 779-9227

March 17, 1999

DSL/RAB:bfm
981083

TABLE OF CONTENTS

INTRODUCTION

In accordance with KTA proposal PN-981654 to Commonwealth Engineering, Mr. David S. Leyland of KTA-Tator, Inc. examined the condition of the coating system on the Sakonnet River Bridge, which carries traffic on Route 24 between Tiverton and Portsmouth Rhode Island. The inspection was aided by the use of lift trucks and hydraulically operated boom trucks supplied by the Rhode Island Department of Transportation.

The purpose of the examination was to determine the condition of the coating system in order to provide recommendations for maintenance coating work. This report includes background information, observations and data from the field investigation, laboratory results, a discussion of the findings and recommendations for maintaining the protective coating system on the bridge. Photographs depict typical coating conditions.

SUMMARY

The coating system on the Sakonnet River Bridge is in poor condition. This bridge is not considered a viable candidate for spot repair and overcoating. The recommended course of action is to completely remove the existing coatings by abrasive blast cleaning, followed by the application of a new coating system. The existing coating system is less than 20 mils in thickness but is very brittle and the adhesion of the primer to the substrate was rated from fair to very poor. The aged, existing coating system would provide a weak foundation on which to build additional coating layers. If these aged coatings are overcoated there is a substantial risk of premature failure. The mode of failure would involve the complete disbonding of all coating layers down to the mill scale. The repair costs to correct a premature overcoating failure would likely be more expensive than the original overcoat work.

Whether the decision is to repair or replace the coating system, procedures will involve the removal of a lead and chromium based coating system. It would be better to use available funding to remove the brittle aged lead and chromium based system before applying any additional coating layers. Removal of the lead based coatings by abrasive blast cleaning would nearly eliminate the risk of premature coating failure when a new coating system is applied; removal would also eliminate costly health and environmental requirements associated with any future maintenance work that disturbs lead paint.

BACKGROUND

Background information was provided by Mr. Vartan Sahakian of Commonwealth Engineering and Consultants, Inc. of Providence, Rhode Island.

Commonwealth Engineering is performing a structural evaluation of the Sakonnet River Bridge and KTA has been asked to evaluate the coatings on the bridge. The Rhode Island Department of Transportation maintains this highway bridge. It carries automotive and truck traffic on Route 24 between Tiverton, Rhode Island and Portsmouth, Rhode Island. The bridge is approximately 2900 feet in length and consists of 3 truss spans and 3 continuous girder spans on the Portsmouth (west) side of the truss and 13 continuous girder spans on the Tiverton (east) side of the truss. There are also 2 simple beam approach spans on the Tiverton side and 6 simple beam approach spans on the Portsmouth side.

There has been periodic maintenance painting work performed on this bridge, though the exact dates of painting were not provided during the course of this investigation. It was reported that the bridge was last painted during the 1980s by a private contractor. The scope of work of previous maintenance painting work was not provided.

The Sakonnet River Bridge is being evaluated for extensive structural repairs, and as part of the investigation, the condition of the coating system is being evaluated. The costs of repainting a bridge can be substantial, and may influence the entire direction of the renovation plan for the bridge. Therefore, KTA was requested by Commonwealth Engineering to evaluate the condition of the existing coatings and provide appropriate recommendations and cost estimates for repair or replacement of the coating system.

FIELD EVALUATION

The condition of the coatings on the Sakonnet River Bridge was evaluated on October 23, 1998 and November 22, 1998. The evaluation involved general and detailed observations of the coating and steel substrate, dry film thickness measurements and coating adhesion testing. The condition of the bridge coating was photographed and paint chip samples were removed to determine if they contained lead. A hydraulically operated lift truck was used to access areas beneath the east approach spans on the Tiverton end of the bridge. A hydraulically operated bucket truck was used to access areas beneath the west simple beam approach spans, the west continuous girder spans, and the truss spans on each side of the main river span. The condition of the coating on the east bents was also observed from the ground.

Coating Thickness

Dry film thickness measurements were performed with a Positector 6000 Type II gauge, which has a fixed magnetic probe that can be used to determine the thickness of non-ferrous coatings on ferrous substrates. A Tooke Gauge was used in random locations to measure total film thickness, as well as the thickness of individual coating layers within the coating system. The Tooke Gauge has a machined cutting tip that is used to slice through the coating at a precise angle, which exposes individual coating layers. The gauge has a 50X microscope with a reticule in the eyepiece that enables the viewer to determine the thickness of individual coating layers, see visible contaminants in or beneath the coating, voids and other coating or surface preparation defects.

Coating Adhesion

Adhesion testing was performed in accordance with Method A of ASTM D 3359, "Standard Test Methods for Measuring Adhesion By Tape Test." Method A, the X-cut test involves scribing two lines through the coating to the substrate that intersect at an angle between 30 and 45 degrees. Pressure sensitive tape, Permacel 99, is carefully applied over the intersecting X-cut, then rapidly pulled away. Coating adhesion is based on the amount of coating removal. The test method provides a rating scale from "5A", representing no coating removal (excellent adhesion), to "0A", representing coating removal beyond the area of the scribe (very poor adhesion). Ratings of "2A" or better are usually considered sufficient for a coating system to be overcoated, although this is not the sole criteria.

Observation and Field Test Results

The findings from the field evaluation of the coatings on various spans included a visual assessment of the coating condition and distribution of corrosion, dry film thickness measurements and coating adhesion results. These are summarized below.

Tiverton (East) Approach Spans

Most of these spans could only be viewed from the ground, though a lift truck permitted a close examination of several spans beneath the main roadway and also beneath the entrance and exit ramps near the end of the approach. The coating condition on the steel bents beneath these spans was also examined.

- **Visual Assessment** - The general condition of the coating system was poor. The pattern of coating breakdown and corrosion was similar to other portions of the bridge and included areas beneath the expansion joints and beneath the centerline of the bridge. The bents are generally beneath expansion joints and are beneath the centerline; therefore they are in particularly poor condition. There is extensive coating breakdown and accompanying pitting corrosion. The extent of coating breakdown and corrosion exceeded 20 percent in these areas. Throughout the approach spans, micro-checking ranged from 5 to 20 percent of the surface area.

- **Coating Thickness** - Coating film thickness ranged from 6 to 8 mils in the areas that had been spot cleaned and spot painted. The areas that were spot cleaned and coated consisted of four coating layers as follows: 2 mils orange, 1 mil tan, 1 mil green and 2 mils green. Elsewhere, the total coating thickness ranged as high 20 mils, where the original coating layers were intact and several maintenance coating layers had been applied. Observations made using the Tooke Gauge revealed that there were as many as eight layers of paint on the outside fascias, and usually five or six layers on the interior members. Typical coating layers were as follows: 1 mil orange primer, 3 mils gray, 2 mils green, 2 ½ mils orange, 2 ½ mils tan, 4 mils green and 3 mils green topcoat. The fact that a green finish coat appears three times on many areas of the bridge indicates that maintenance painting had been performed at least twice since the bridge was originally erected and painted.

- **Adhesion** - Overall adhesion of the aged coatings was judged to be poor, ratings were 0A or 1A in the areas examined except on the outside fascia of Span 23, where the adhesion was rated 2A. The only areas of good adhesion were where spot cleaning and touchup had been performed. In these areas the original coating had been removed and the touchup material was applied to essentially bare steel. Adhesion in the touchup areas was rated 4A.

West Approach Spans 1 through 9

The west approach includes 6 simple beam spans and 3 continuous girder spans.

- **Visual Assessment** - The most visible areas of corrosion are occurring on the steel bents, areas beneath the centerline of the bridge and around the expansion joints. Apart from areas of corrosion, observations of the bridge from the ground give the appearance that the coating system is intact, but this not really the case. Close observations made from a bucket revealed that there is extensive micro-checking on about 20 percent of the surface area, even though corrosion does not necessarily accompany the micro-checking.

- **Adhesion** - Coating adhesion was fair to poor, generally rated 1A to 2A. The widespread micro-checking on the girder webs demonstrates the brittle condition of the coating system. Coating thickness ranged from 10 to 18 mils.

Truss Spans 10, 11 & 12

- **Visual Assessment** - The general condition of the coating system was poor, as found elsewhere on this bridge. The pattern of coating breakdown and corrosion was found on exterior diagonals, the bottom chord, interior members beneath the expansion joints and beneath the centerline of the bridge. The coating system was also in poor condition on the bottom surfaces of most bottom truss members; often the extent of coating breakdown and corrosion exceeded 10%. The interior members of the truss that were not beneath the centerline of the bridge were in better condition. They exhibited relatively little corrosion. There was generally less micro-checking of the coating on this portion of the bridge.

  Previous coating work was sloppy as evidenced by a pigeon's nest, which had been painted over, and the lens of a navigation light that was also painted.

- **Adhesion** - Coating adhesion was similar to that elsewhere on the bridge; generally being fair to poor, being rated 1A to 2A. There was much less micro-checking even though the coating thickness generally ranged from 10 to 18 mils as found at other, micro-checked coatings.

SAMPLES AND LABORATORY TEST RESULTS

SAMPLES

The following samples were collected by David S. Leyland during the field examination of the bridge coatings.

Sample #1 – Paint chips, labeled "Floor Beam 3, Span 7".

Sample #2 – Paint chips, labeled "Floor Beam 4, Span 9".

Sample #3 – Paint chips, labeled "Floor Stringer E, Span 12, Bay 26".

Sample #4 – Paint chips, labeled "Floor Stringer E, Span 11, Bay 4".

Sample #5 – Paint chips, labeled "Floor Beam 2, Span 10, Bay 3".

LABORATORY TESTING

The laboratory testing consisted of determining the total content of lead, chromium and cadmium of the paint samples in accordance with AOAC Method 974.02. This method has a detection limit of 62 parts per million for lead and 25 parts per million for chromium and cadmium. This method involves digesting the chips in acid, filtering, and analyzing by atomic absorption spectroscopy. The results of this testing were as follows:

Sample #	Cadmium, ppm	Lead, ppm	Chromium, ppm
1	<25	242,000	3,580
2	<25	246,000	4,500
3	<25	220,000	2,260
4	<25	266,000	3,220
5	<25	264,000	2,990

Note: 10,000 ppm is equivalent to 1% by weight.

The presence of chromium is addressed under OSHA Regulation 29 CFR 1926.55, which is a generic Standard covering certain materials, gases, vapors, and fumes. This regulation classifies chromium as a hazardous material.

The OSHA Construction Lead Standard (29 CFR 1926.62) is applicable if the coating contains lead in any amount. Paragraph (a) of the Standard, entitled "Scope" specifically states that performance of renovation; paint removal and demolition activities where lead and materials containing lead are present are applicable to this regulation. Therefore, workers performing renovation, paint removal and demolition activities on surfaces containing lead will be subject to 29 CFR 1926.62.

The Standard establishes presumed exposure levels for lead, based upon the activity being conducted. The Standard requires that initial protection be provided for any activities with presumed exposures at or above the OSHA action level, until an exposure assessment is conducted to evaluate actual worker exposures. Initial protection includes: biological monitoring (lead and ZPP), training, respiratory protection (based on presumed exposure), personal protective equipment, hand wash facilities, and a change area. Following the exposure assessment, additional work practice and engineering controls may be required.

Additionally, dependent on the methods of removal, renovation or demolition, consideration should be given to protecting the environment, the public and adjacent workers from potential exposure to lead. Lead is classified as a hazardous material, therefore, the waste generated from renovation, paint removal and demolition activities also must be tested to determine if it is hazardous under the EPA Hazardous Waste Regulations.

In order for a coating system to be considered a good candidate for spot maintenance and overcoating, the amount of coating deterioration and/or corrosion should be less than 15 to 20 percent of the surface area and the remaining coating should be sound enough to accept overcoating. This bridge is not a good candidate for spot maintenance and overcoating. The coating system on this bridge is very brittle and generally has poor adhesion to a smooth mill scale substrate. This is a poor foundation onto which build additional coating layers. Furthermore, the extent of corrosion beneath the centerline of the bridge is extensive, and corrosion has affected large areas of the truss portion of the structure, perhaps as much as 10 to 20 percent of the total surface area. It would make little sense to aggressively clean 10 to 20 percent of the surface area, while overcoating a fragile, brittle and poorly adherent coating on the remaining areas. There is a substantial risk of premature coating failure if the existing coatings are overcoated.

Total Removal and Replacement

This is the only viable option. It requires abrasive blast cleaning of all surfaces, in order to remove the existing lead and chromium based paint system, as well as the mill scale beneath. The degree of surface preparation achieved would be essentially "Near White", SSPC-SP10/NACE 2. The cleaning operations should also include chloride removal requirements, limiting the residual chlorides to less than 10 micrograms per square centimeter, as tested with a SCAT kit or similar testing equipment.

The paint removal process will be costly due to presence of the toxic metals lead and chromium. Federal mandates require the containment and proper disposal of all waste generated during the cleaning operations. Furthermore, OSHA requires a written plan that addresses the extensive measures that must be taken to protect the workers, which includes, but is not limited to the following: protective clothing, breathing apparatus, shower and cleaning facilities, blood testing and continued health monitoring. The worker protection requirements pertaining to lead are in OSHA Construction Lead Standard (29 CFR 1926.62). Although full-scale removal of a lead containing paint system is expensive, once it has been removed, future maintenance to the bridge will not involve these repeated, costly precautions, because all of the old hazardous paint will have been removed.

Coating System Recommendations

The coating system reapplied to the bridge should consist of three coats, including a zinc-rich primer. Zinc-rich primers are recommended because they tie up residual chlorides that may not have been completely removed during the cleaning operations. When chlorides are tied up, they can not combine with iron and cause further corrosion of the base metal. The intermediate coat should be a high-build epoxy mastic with aluminum flake pigmentation. The intermediate coat should be surface tolerant and capable building a fairly thick film of up to 7 mils. The finish coat should be a urethane, assuming color and gloss retention are important characteristics. If color and gloss is less important than cost, equal protective performance can be achieved by using an epoxy finish coat. An epoxy could be used for the interior members and a urethane finish could still be used on the outside fascias, which are more visible to the public.

The relatively short painting season in Rhode Island may be extended if the selected coating system can be applied at temperatures as low as 35 degrees Fahrenheit. There are epoxies and moisture cured urethanes that have been developed for low temperature application and cure.

Due to the size of the bridge and the short painting season, it may be difficult to complete the painting project within one calendar year. In order to complete the work in one season the contractor must provide all submittals and mobilize early in the spring.

Based upon complete coating removal and replacement of the coating system, as recommended by KTA, it will take two seasons to blast clean and paint the bridge. The estimated cost of the project should range between $10,532,000 ($ 9.95/sq. ft.) and $12,287,000 ($11.61/sq. ft). The coats for traffic control during the painting project will be in addition to the estimate provided. The coat estimate is based on assumptions listed below. It should be noted that unit costs were established by researching similar projects with which KTA has been involved.

Assumptions:

- Estimated surface area to be painted – 1,058,500 square feet. The area includes all steel members including the steel bents. The area was determined by from reviewing drawings provided by Commonwealth Engineers and Consultants, Inc.

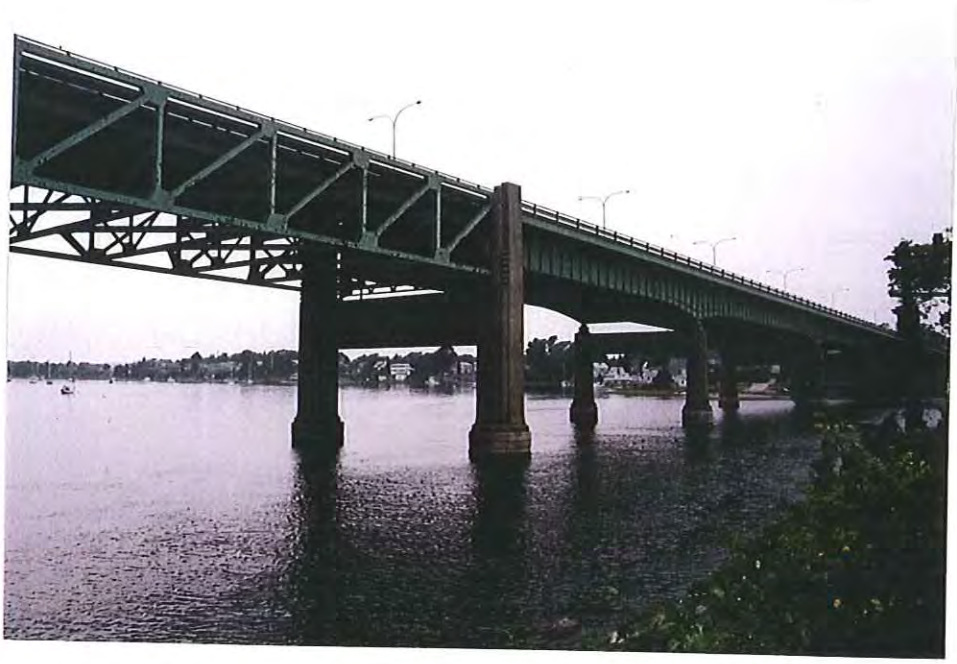
- SSPC- SP10/NACE 2, Near White Blast Cleaning
- Recycled steel grit abrasive
- Apply a three-coat system that consists of a zinc-rich epoxy, an epoxy mastic intermediate, and a urethane finish.
- Airless spray within containment.
- Containment- Class 1A, SSPC Guide 6. This is required due to the presence of high levels of lead in the existing coating system.
- Full compliance with OSHA 29CFR1926.62, Worker Safety During Lead Based Coating Removal.
- One lane traffic closure during the entire term of the painting contract.
- Marine traffic maintained
- Two year contract to clean and paint

The cost breakdown follows:

Labor	26%
Equipment	10%
Paint Materials	7%
Site Mobilization	3%
Containment	39%
Waste Disposal	1%
Overhead	5%
Profit	9%

If cleaning and painting is performed in conjunction with deck removal and replacement, there will be no appreciable difference in cost to perform the cleaning and painting. If lane closures are not permitted the costs for cleaning and painting may increase by approximately 10%.

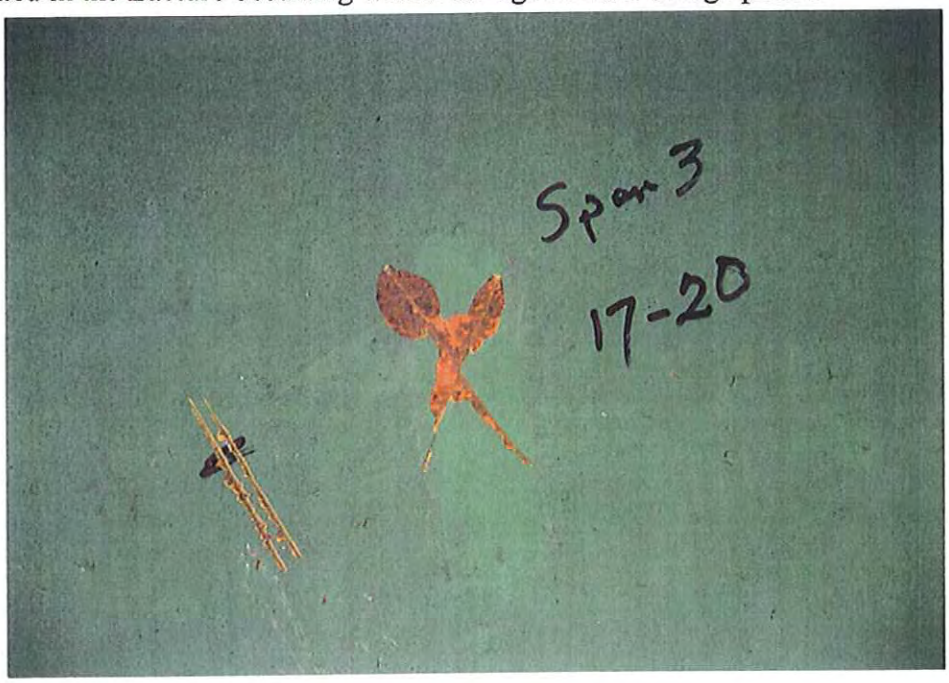
Photographs A and B taken from the north side of the bridge.



Photograph C was taken from the north side of the bridge

Photo D was taken from the south side, looking east.

Photograph No. 1
Site of adhesion test on a rolled stringer in Bay 3. Note poor adhesion results, that resulted in the fracture occurring within the aged brittle orange primer.



Photograph No. 2
Typical coating condition in the west bays. Shown is a stringer in Bay 3.

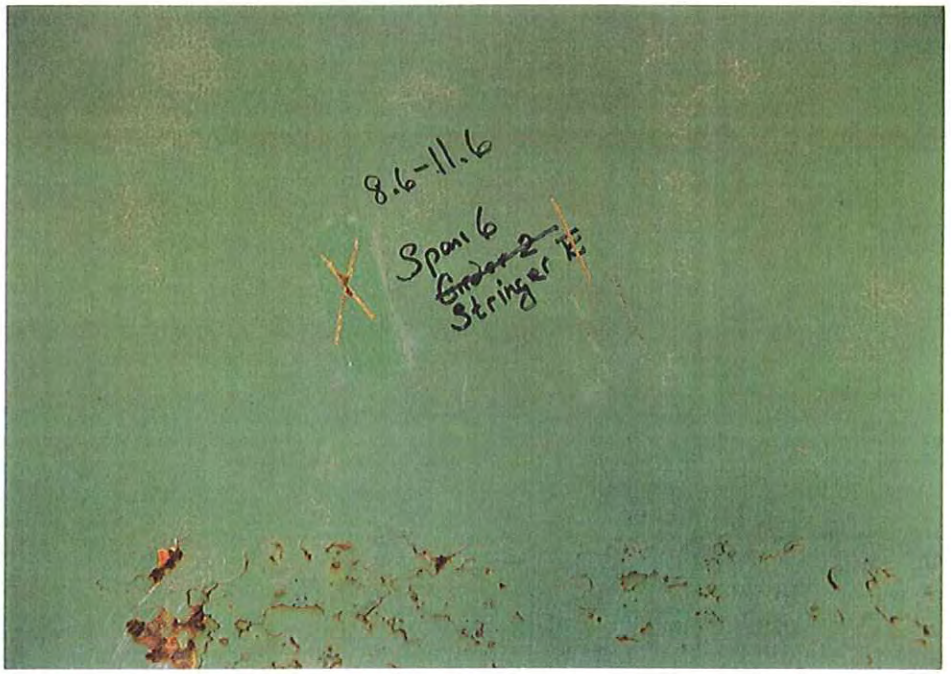
Photograph No. 3
Note corrosion over the center of Pier 3, due to water run-off.

Photograph No. 4
Note the center portion of Bent 2 has corrosion and rust staining.

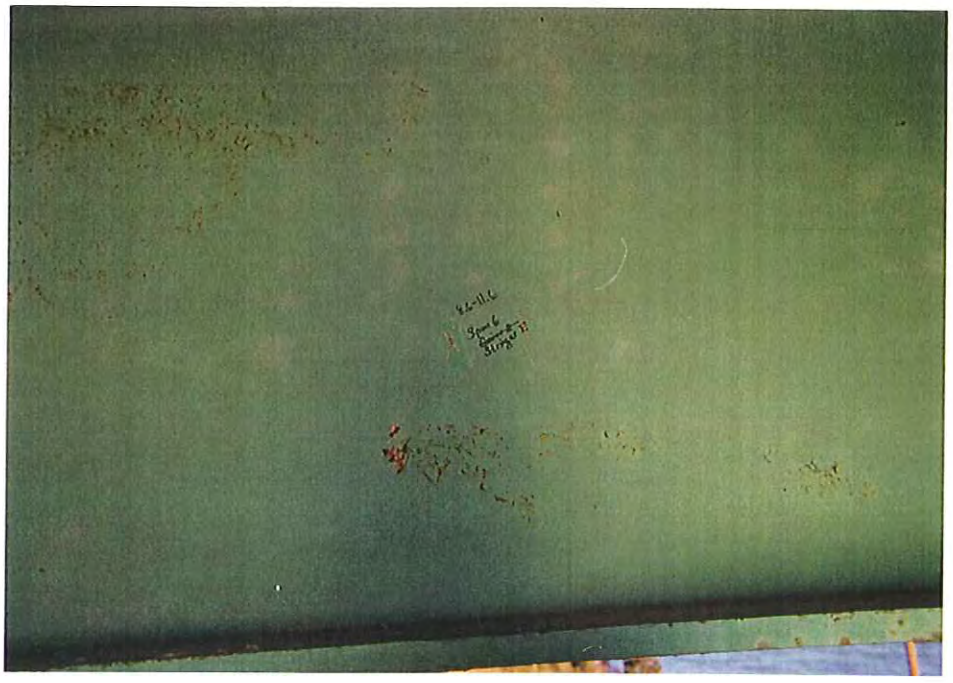
Photograph No. 5
Adhesion was generally improved on the outside fascias, as demonstrated in this photo. Also note that total film thickness was less than many areas of the bridge.

Photograph No. 6
Looking toward Bents 4 and 5, note corrosion on the bottom flange over the Bent, probably due to water leaking from an expansion joint.

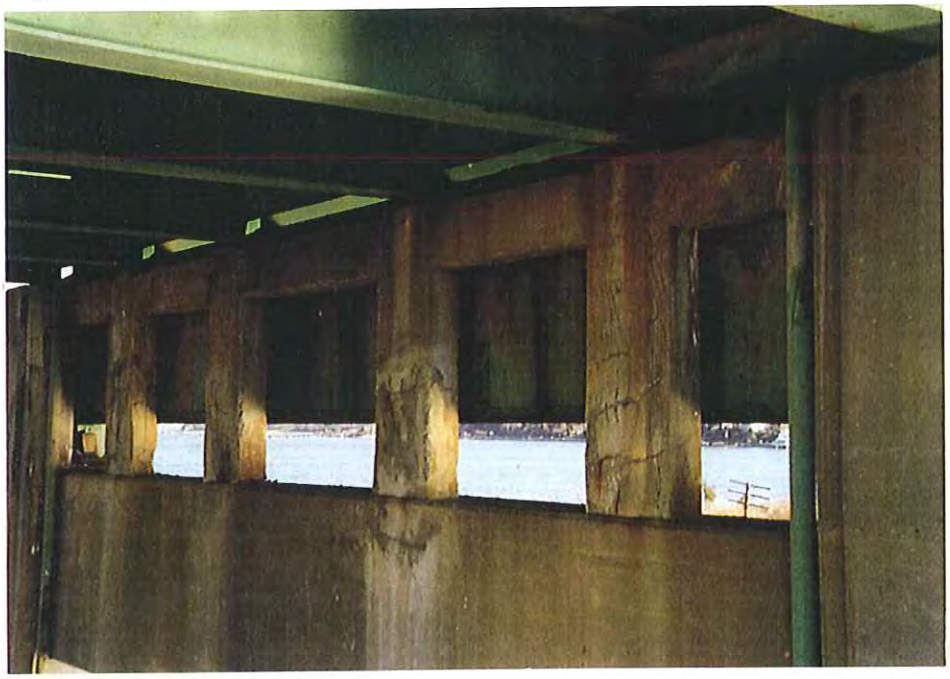
Photograph No. 7
Condition of the web on Stringer E in Span 6. Note areas of fractured coating. Film thickness is 8.6 to 11.6 mils and adhesion is satisfactory, though the surface has chalked.



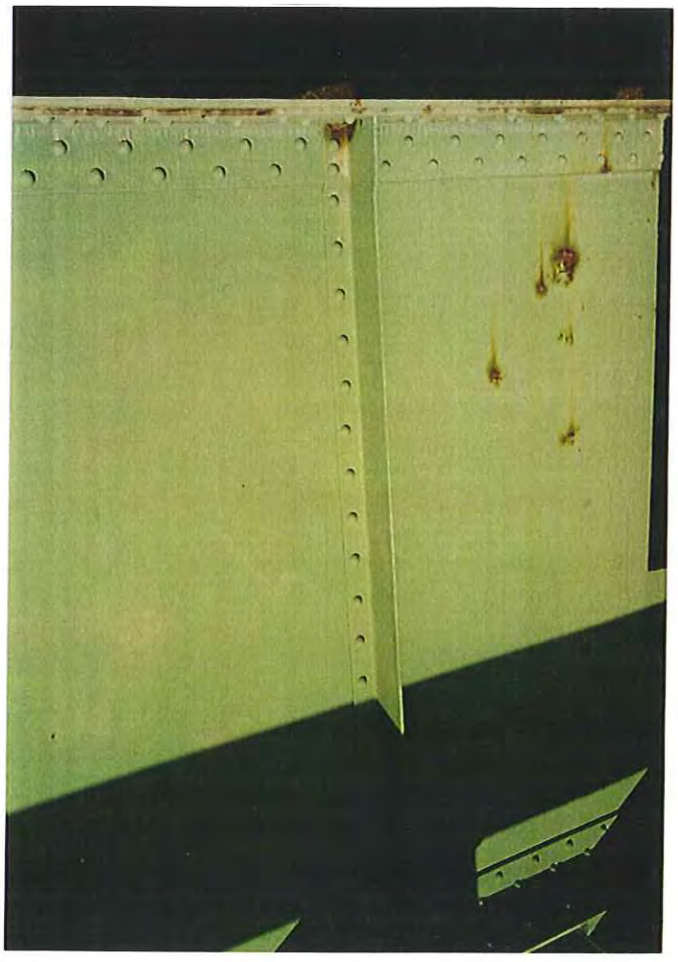
Photograph No. 8
This is a more distant view of the area shown in Photo No. 7



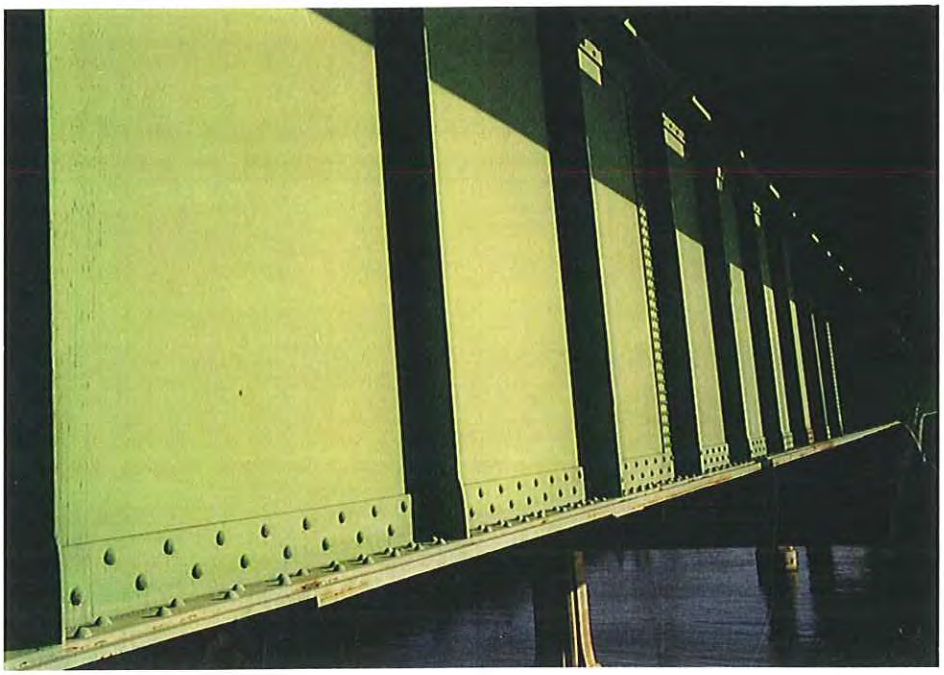
Photograph No. 9
Shown is the west-side of Pier 6. Note the poor condition and of the concrete pier and coating material on the floor beam.



Photograph No. 10
Note areas of coating breakdown and rusting on the south fascia of the main girder at Pier 6. Also note corrosion along the bottom flange



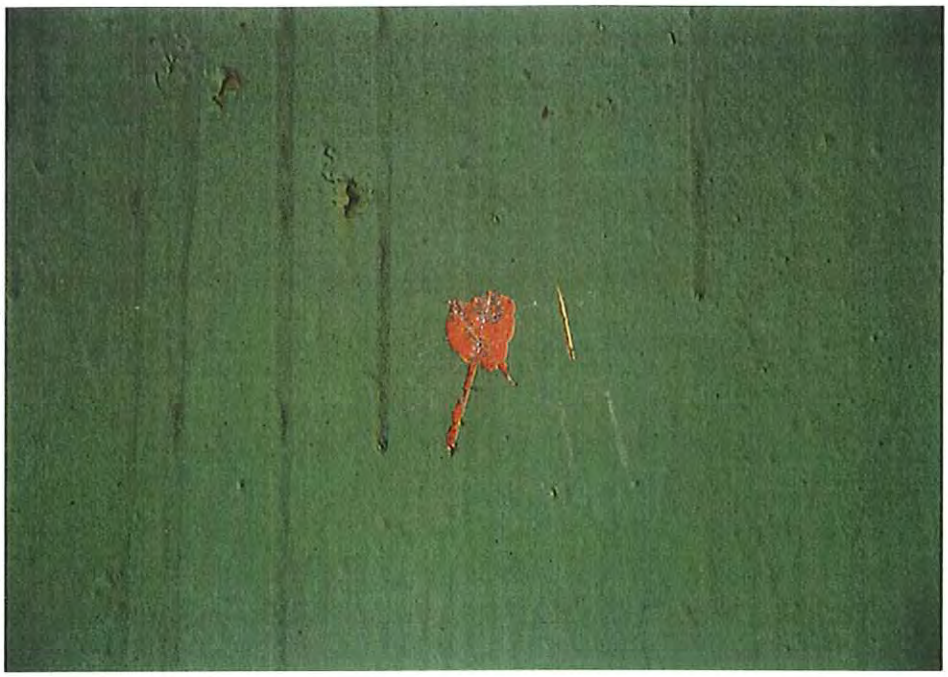
Photograph No. 11
Another view of the main girder in Span 7, looking east toward Pier 8.



Photograph No. 12
Inside main girder Span 7. Note coating breakdown and rusting on the built-up floor beam and main girder, north side of the bridge.

Photograph No. 13
Another built-up floor beam in Span 7
Note extensive coating breakdown and rusting in the center portion of the beam, which is exposed to water run-off.

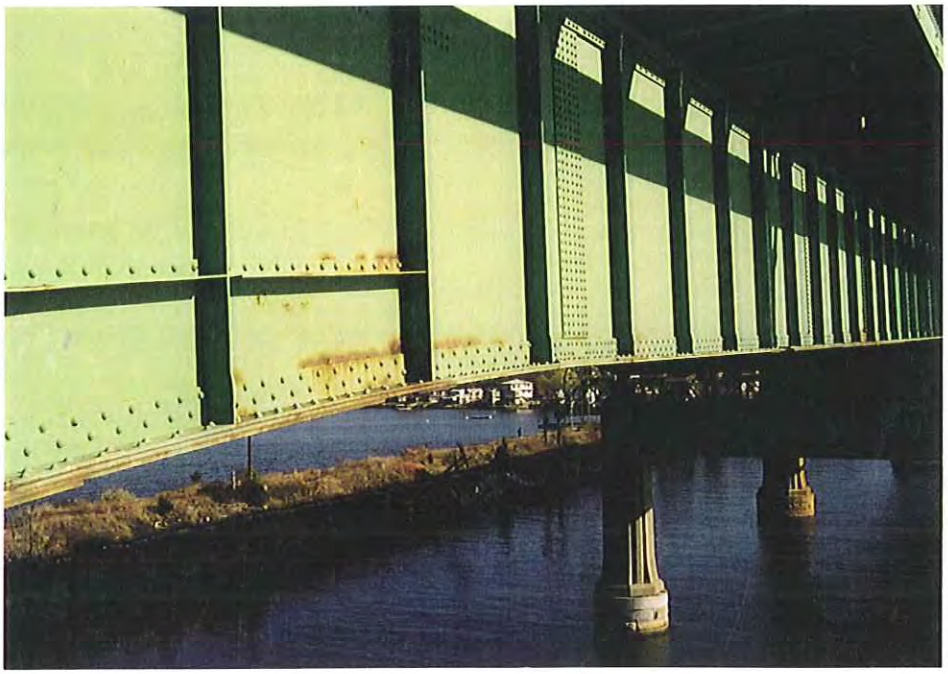
Photograph No. 14
Shown is a floor stringer in Span 7. Although the coating is not peeling, adhesion is not optimum. When tested, fracture occurs within the orange primer.



Photograph No. 15
Shown is another floor stringer in Span 7. Note that coating adhesion is fair to poor and there is corrosion along the bottom flange.

Photograph No. 16
Another area inside Span 7.
Note coating breakdown and rusting on the built-up floor beam and main girder, north side of the bridge.

Photograph No. 17
South outside fascia of Bay 1, Span 8. Note rust along the edge of the bolted plate on the main girder at the bottom of the web.



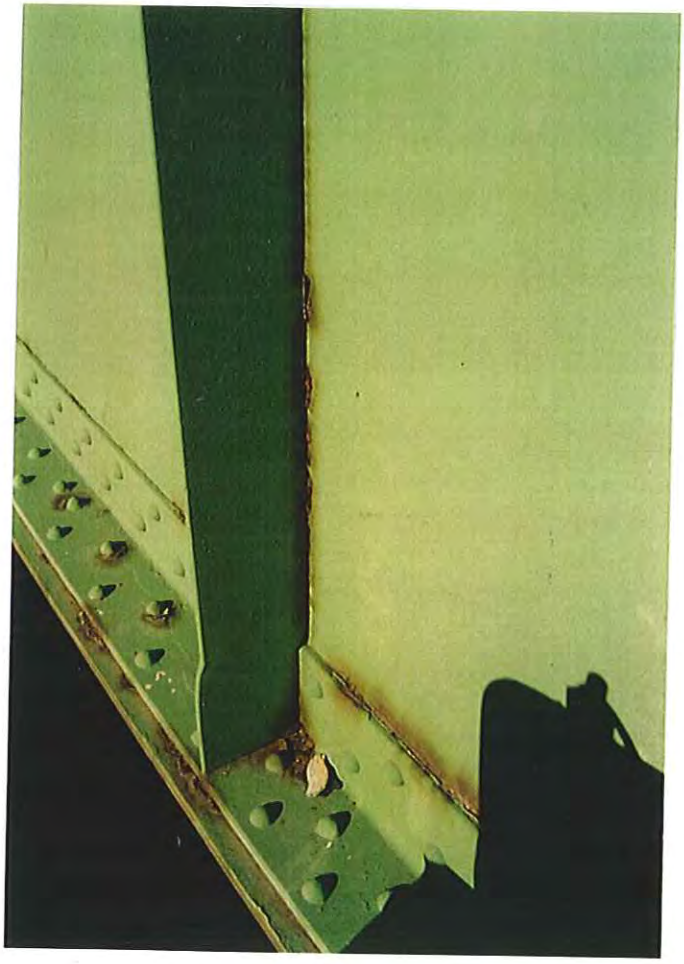
Photograph No. 18
Floor beam and the inside of the main girder span over Pier 7

Photograph No. 19
Same span as shown in Photo 18, but to the right. There is widespread general coating breakdown, though it is difficult to see due to the lighting.

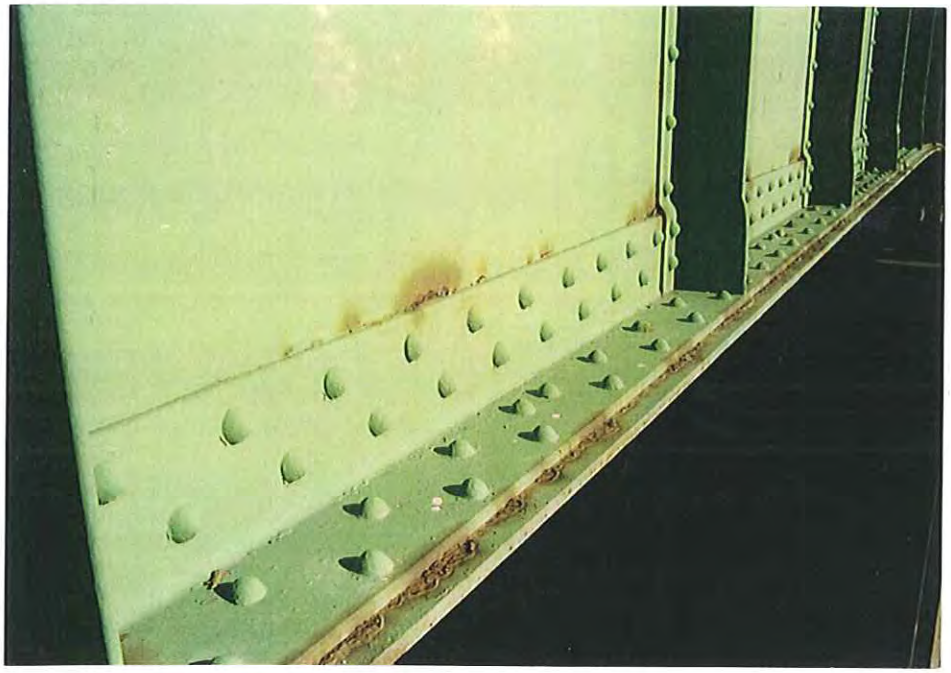
Photograph No. 20
Another photo of Bay 1, Span 8 is shown. Note coating breakdown on the webs and corrosion on the flanges.

Photograph No. 21
A bird nest is shown that has some green paint applied to the top. Surface preparation was obviously less than specified when the bridge was last cleaned.

Photograph No. 22 and No. 23
Note pack rust developing along the bolted angles at the bottom flange and along the stiffeners. These photographs were taken on the south fascia of Span 8.



Photograph No. 22 and No. 23
Note pack rust developing along the bolted angles at the bottom flange and along the stiffeners. These photographs were taken on the south fascia of Span 8.



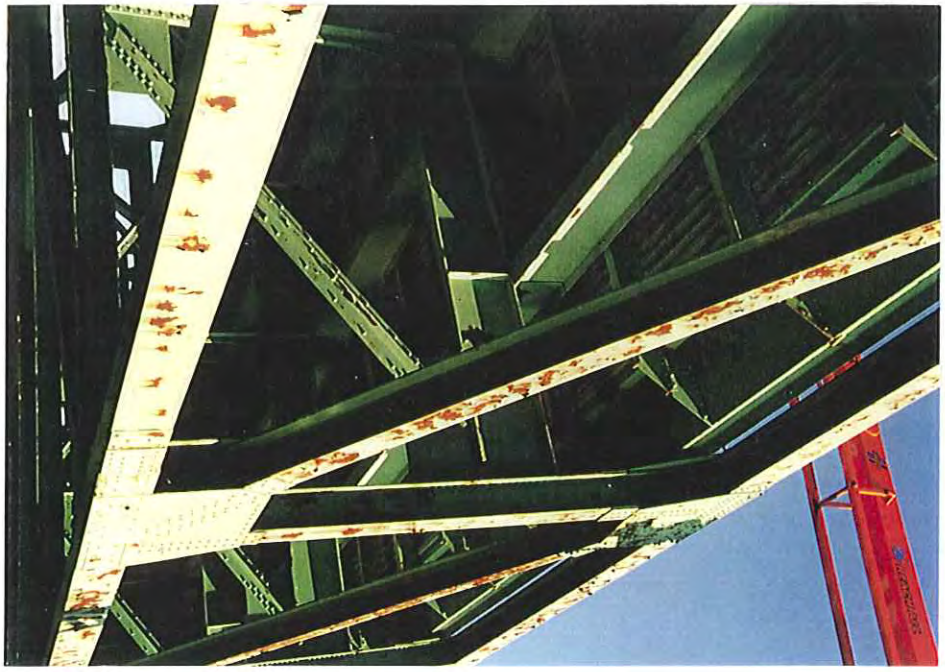
Photograph No. 24
Note generalized coating breakdown and rusting on steel in Span 8, west of Pier 8.

Photograph No. 25
Note generalized coating breakdown and rusting on steel in Span 9, west of Pier 9.

Photograph No. 26
Another photo showing poor coating condition in Span 9.

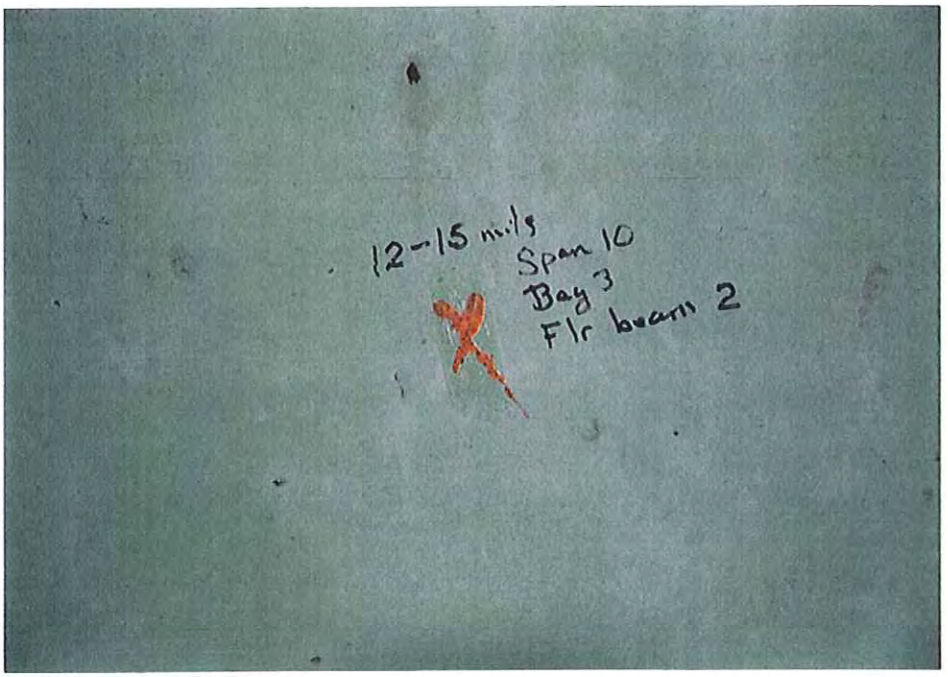
Photograph No. 27
Another view of steel in Span 9, looking toward Pier 9.

Photograph No. 28
Coating breakdown and rusting on the bottom flanges of members in Span 10.

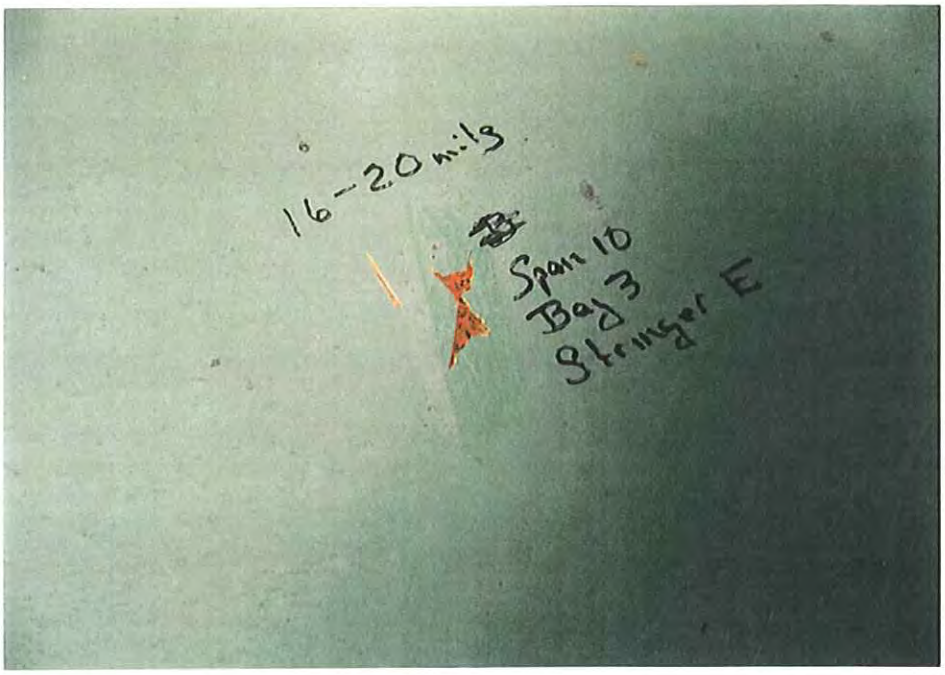


Photograph No. 29
Note rust and coating deterioration on the floor stringer and floor beam in Span 10. The cracked and embrittled coating on the floor stringer was typical throughout Spans 8, 9, 10, 11, and 12.

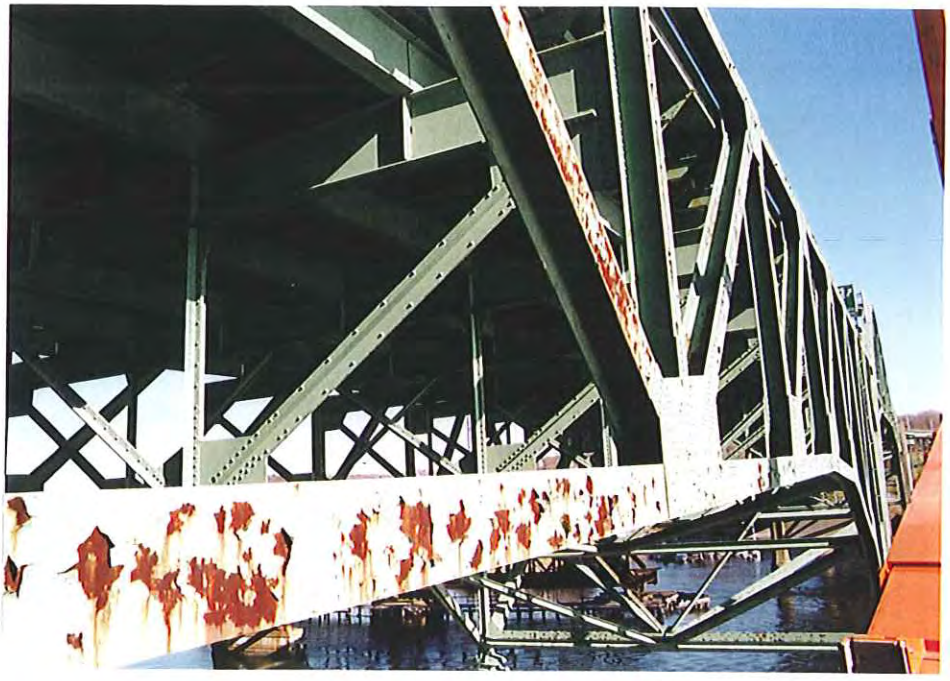
Photograph No. 30
This shows fair to poor coating adhesion in Bay 3, Span 10 on one of the floor beams.



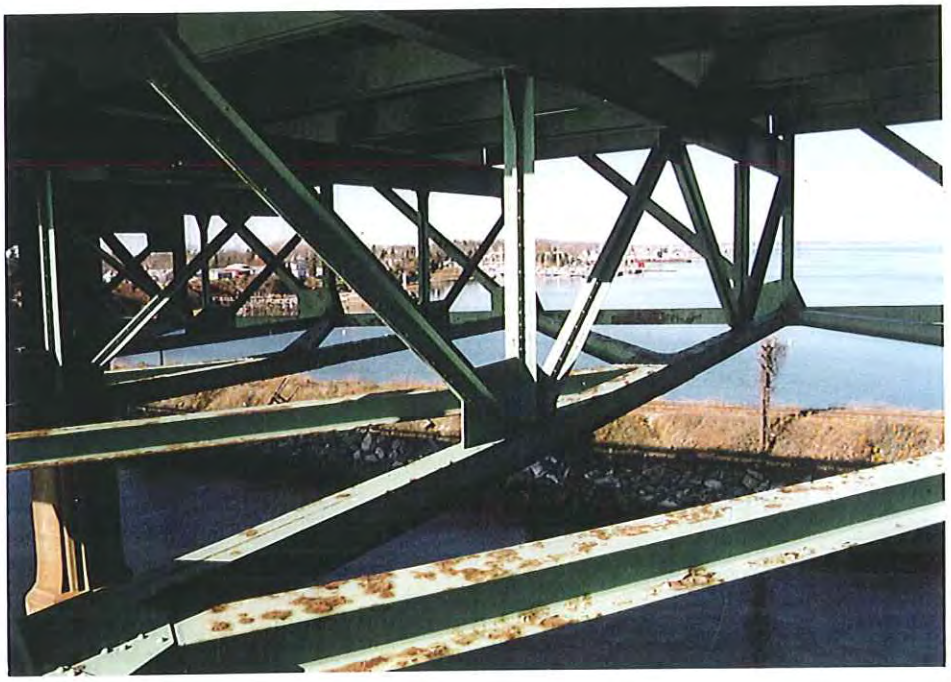
Photograph No. 31
This shows poor adhesion on a floor stringer in Bay 3, Span 10.



Photograph No. 32
Outside fascia of Span 10 has extensive coating breakdown and rusting.



Photograph No. 33
Note corrosion on many interior members of Span 10.

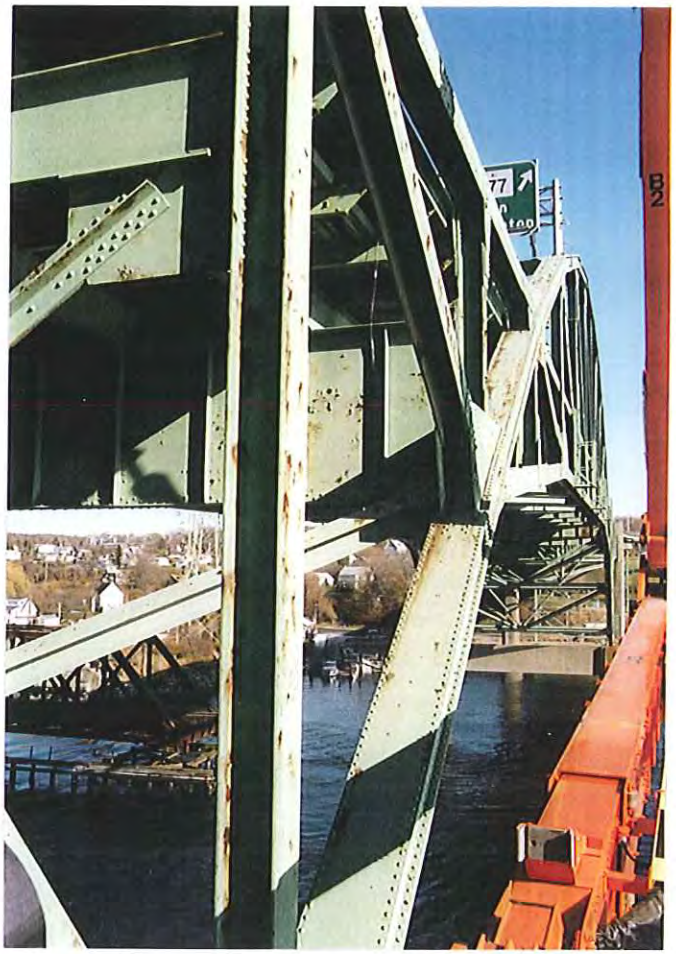


Photograph No. 34
Note the condition of the coatings in Span 10 is generally better in the area closer to Pier 10. However, it is still brittle and adhesion is fair to poor.

Photograph No. 35
This photo, taken in Span 10 toward Pier 10, shows a coating system that is better than condition found on the vast majority of the bridge.

Photograph No. 36
Shown is extensive corrosion on the exterior south side of Span 10, just west of Pier 10.

Photograph No. 37
Shown is the south west end of the arch in Span 11. Note widespread coating breakdown.



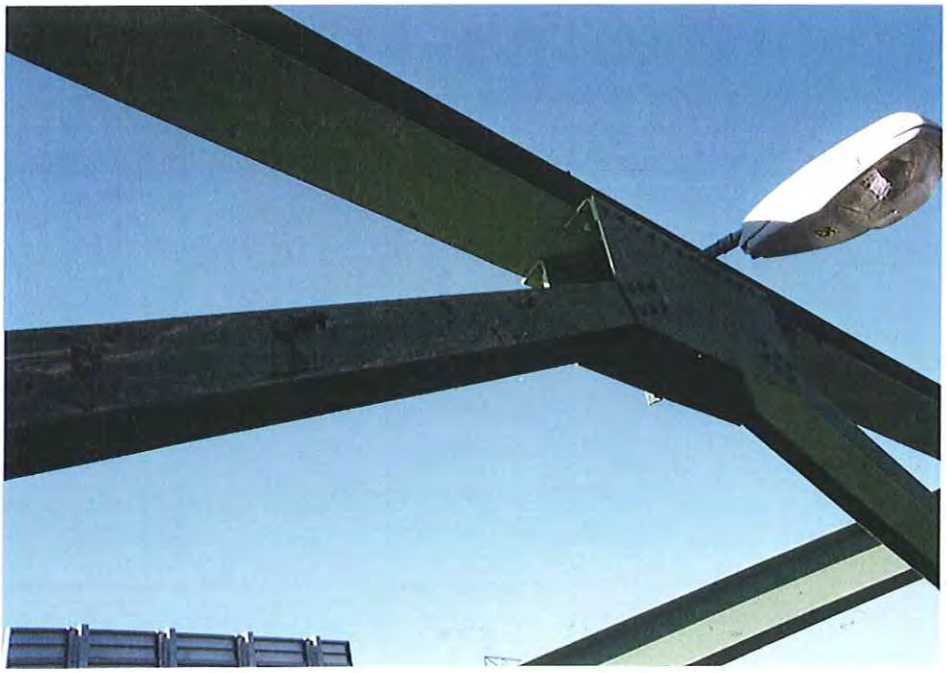
Photograph No. 38
Shown is the south west gusset plate of the arch, where the upper and bottom chord connect.

Photograph No. 39
Note the extensive corrosion on the floor beam and attached lateral.

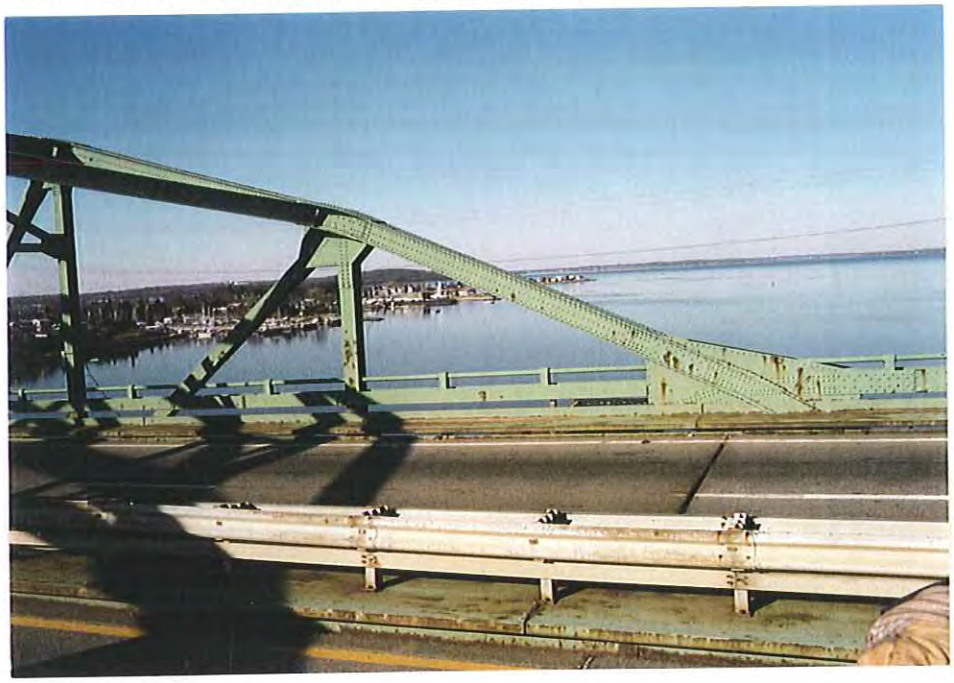
Photograph No. 40
Note the coating system on the steel beneath the arch is beginning to break down, Span 11.

Photograph No. 41
This photo shows coating breakdown
and poor workmanship that resulted in
the signal light being sprayed with green paint.

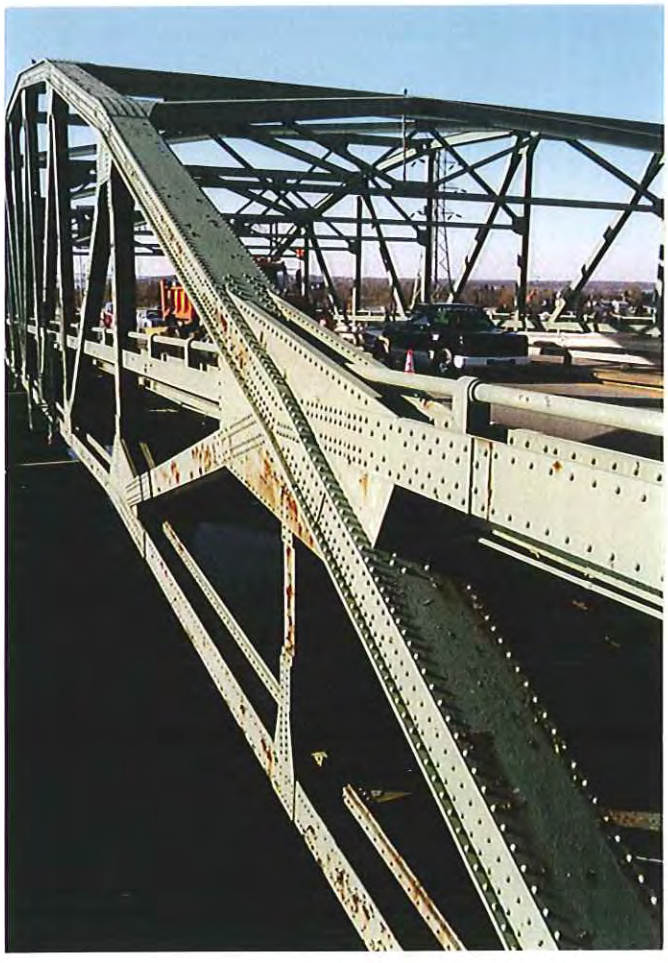
Photograph No. 42
The coating breakdown shown on this overhead member in the arch is typical.



Photograph No. 43
This photo shows coating breakdown on the east end of the arch above the roadway, and the condition is similar to that shown in Photo No. 42

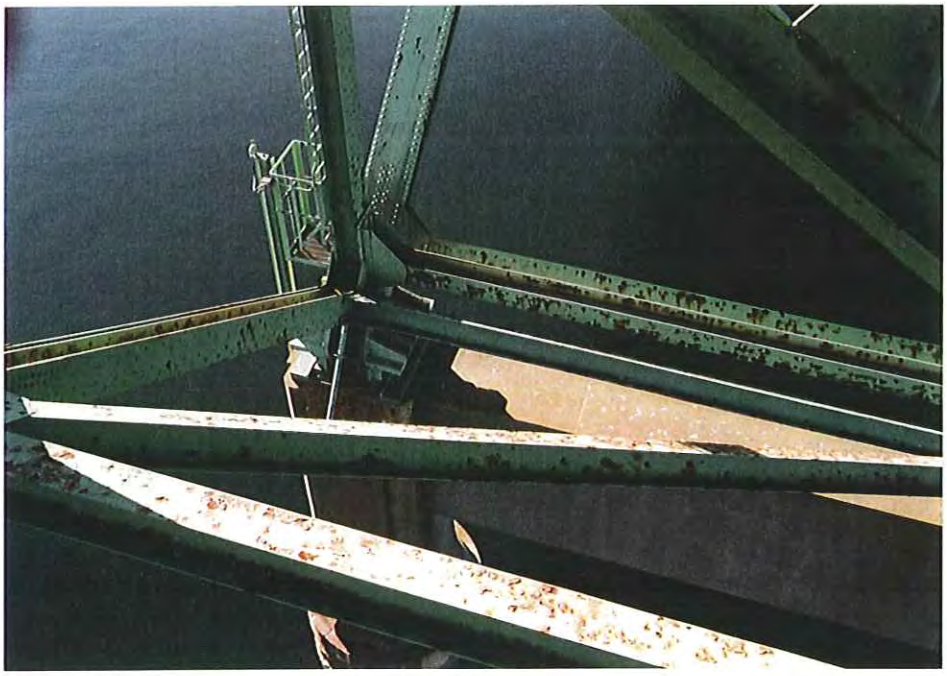


Photograph No. 44
Coating breakdown on the outside of the southeast end of the arch.

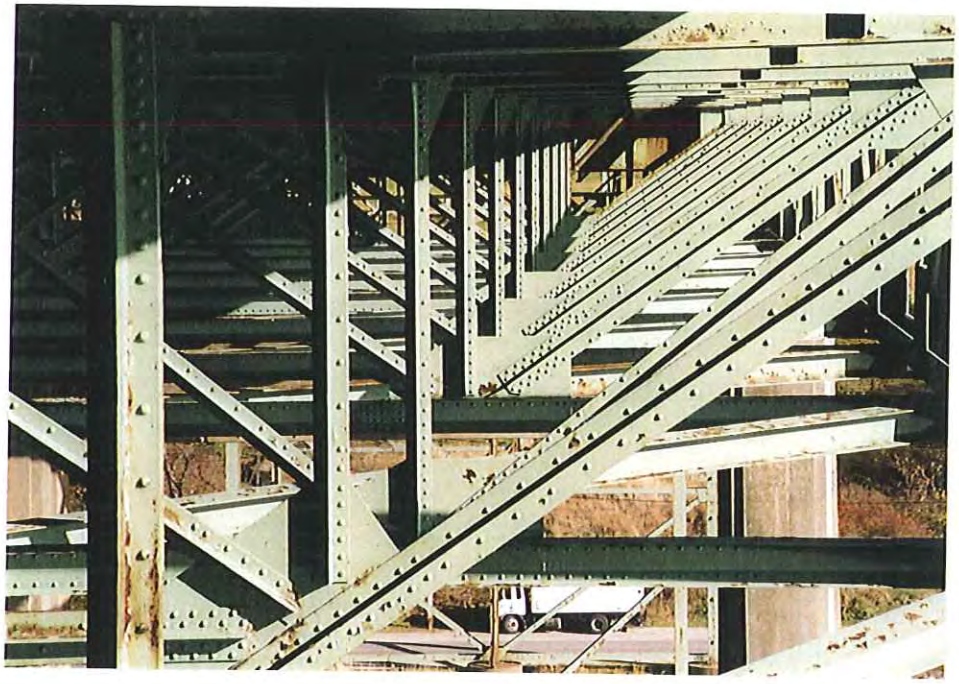


Photograph No. 45
Coating breakdown on the
floorbeam west of Pier 11 in Span 11.

Photograph No. 46
Coating breakdown on interior steel near Pier 11.



Photograph No. 47
A view of the steel beneath Span 12.
Note areas of breakdown and rusting.

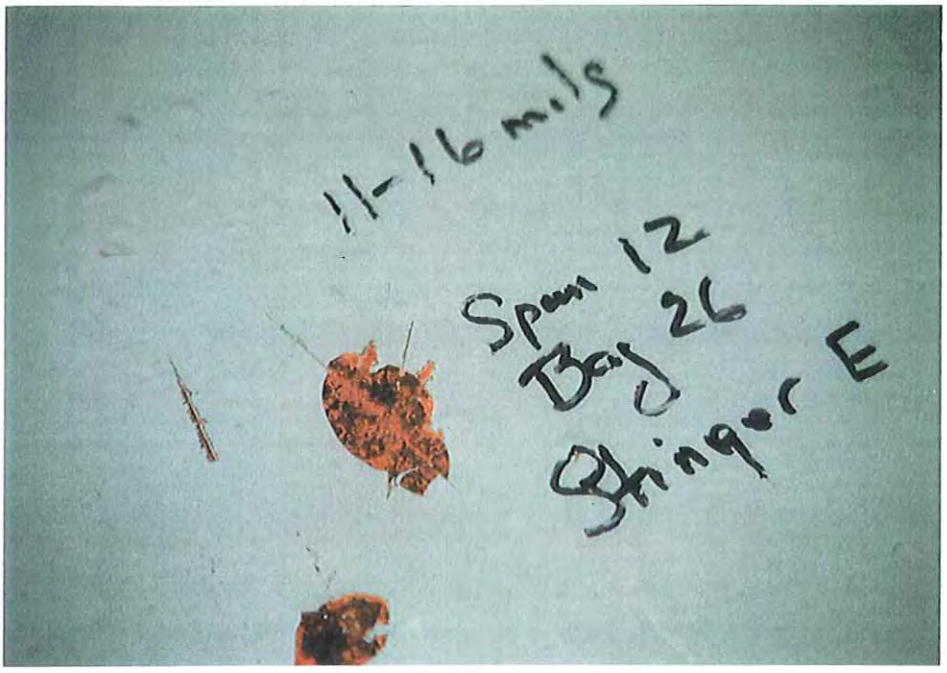


Photograph No. 48
Coating breakdown in Bay 2, Span 12 on the floorbeam and attached steel.

Photograph No. 49
Shown is corrosion on the top flange of a floorbeam in Span 12 and also on the web of the floor stringer.

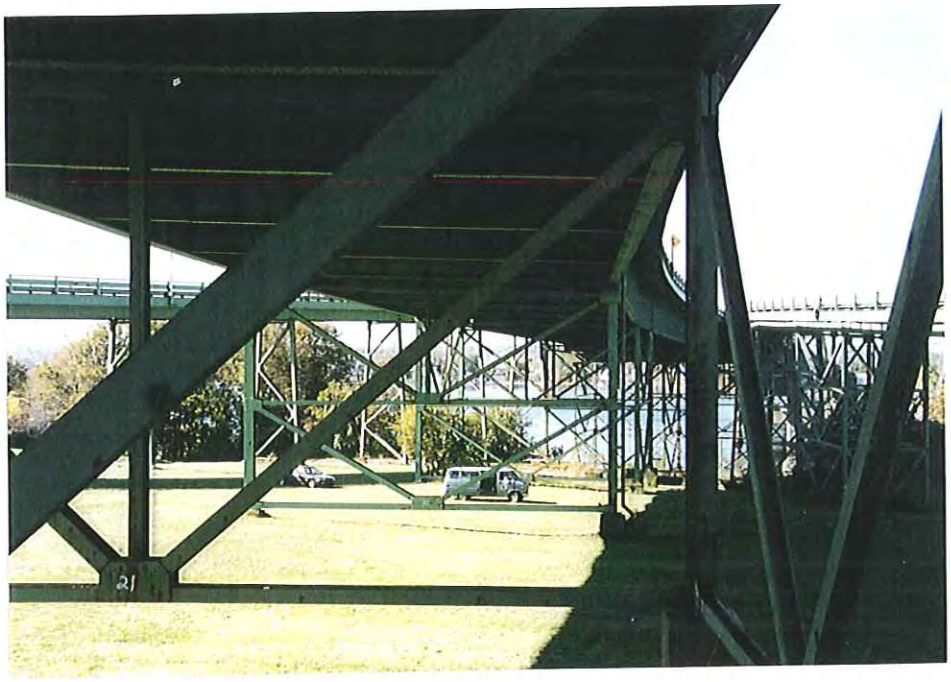
Photograph No. 50
This photo shows coating breakdown beneath near Pier 11. Photo was shot west toward the arch.

Photograph No. 51
This shows the poor adhesion on the floor stringer where the coating thickness was 11 to 16 mils. Fracture occurred in the weak orange primer.

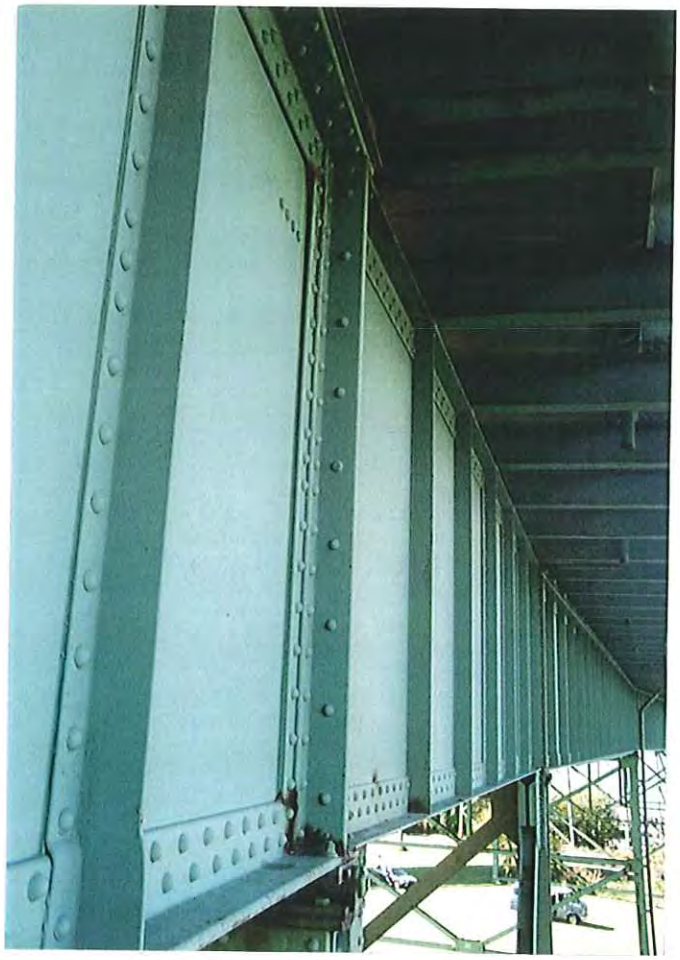


Photograph No. 52
This photo shows the difference in coating condition between two bays in the east continuous girder span.

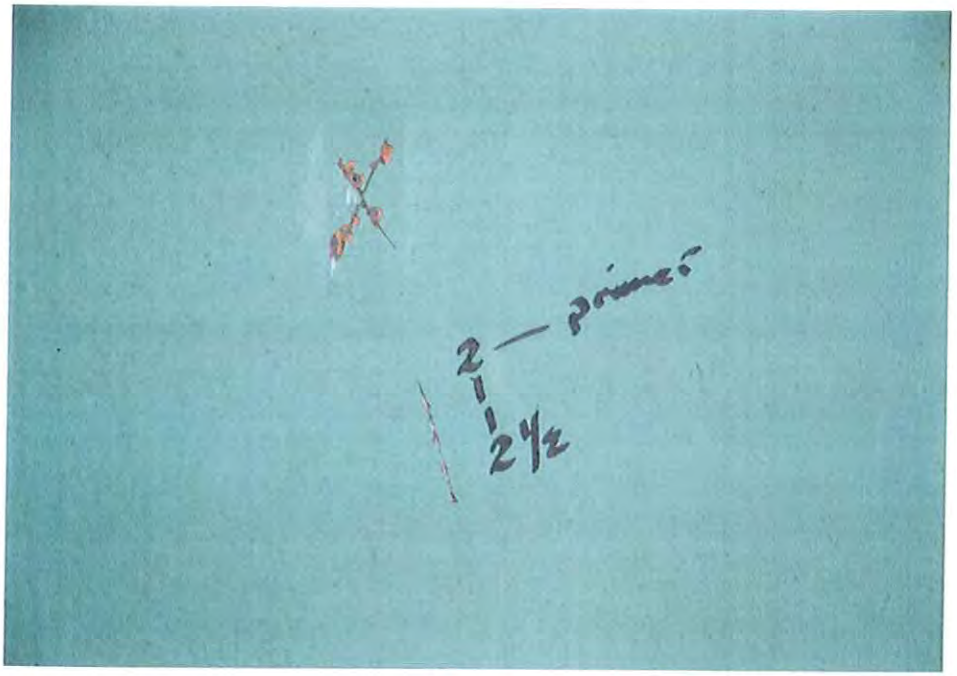
Photograph No. 53
The condition of the coated steel beneath near Bent 21 is shown.



Photograph No. 54
North outside fascia in Span 23.
Note the good coating condition.



Photograph No. 55
Note fair adhesion and thickness of each coating layer. Thickness is less than most areas of the bridge.



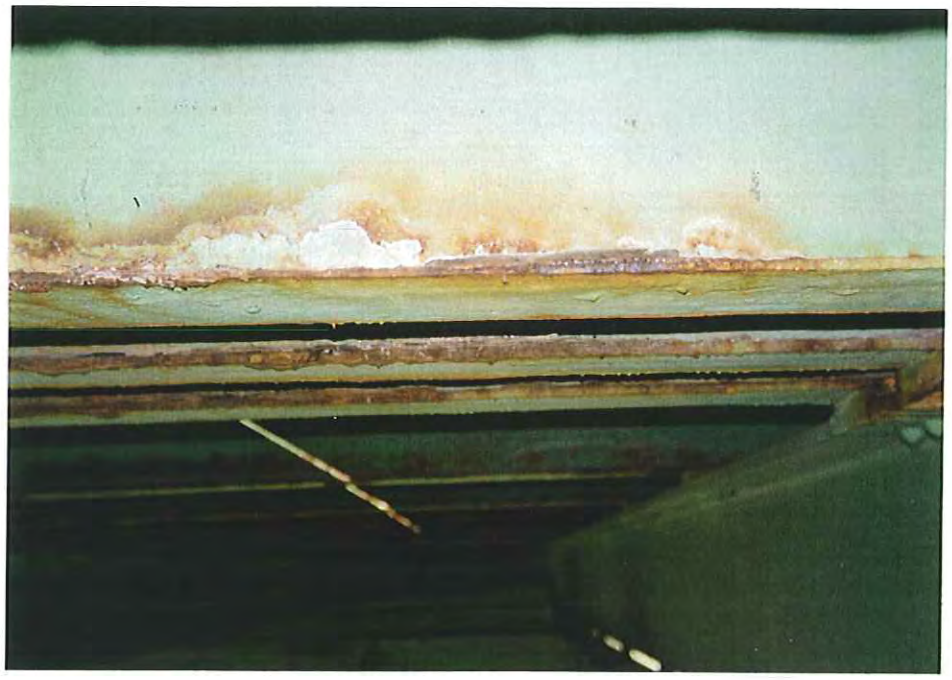
Photograph No. 56
This is the typical poor condition
of the steel on Bents 19 through 27.

Photograph No. 57
This shows the brittle nature of the coating on the interior members in Span 19 through Span 27; it has spontaneously cracked.

Photograph No. 58
Close-up of the cracked coating in Photo No. 57. Note fracture is in the weak orange primer.

Photograph No. 59
Note islands of paint that are beginning to crack and peel.

Photograph No. 60
Corrosion along the bottom flange of floor stringers in the girder approach spans on the east end of the bridge.



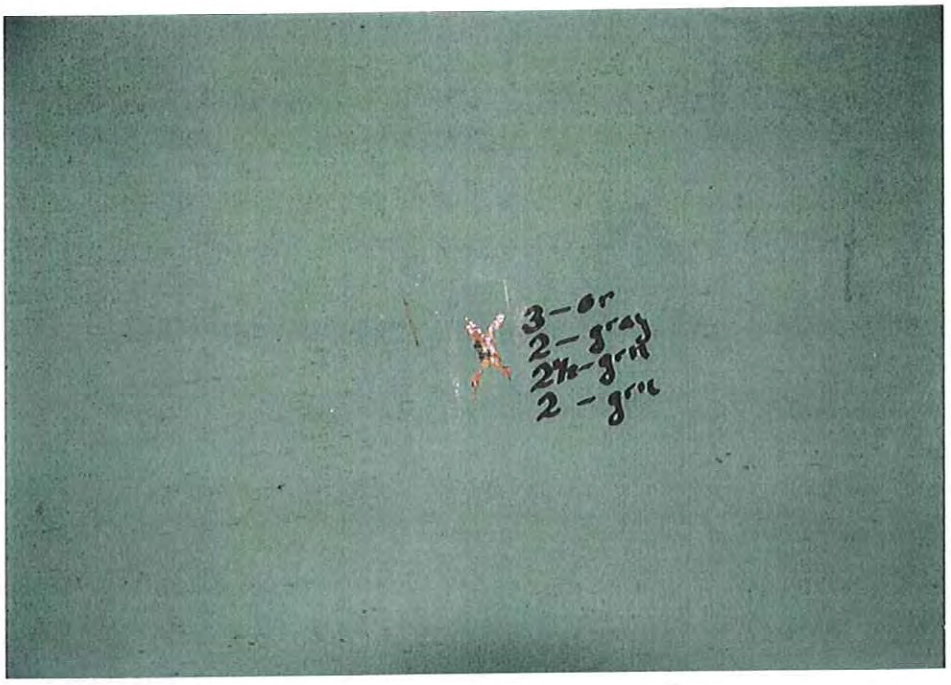
Photograph No. 61
Corrosion at the top of a bent and lower portion of a floor beam on the girder approach spans.

Photograph No. 62
Another view of the bents on the approach span and the typical poor coating condition.

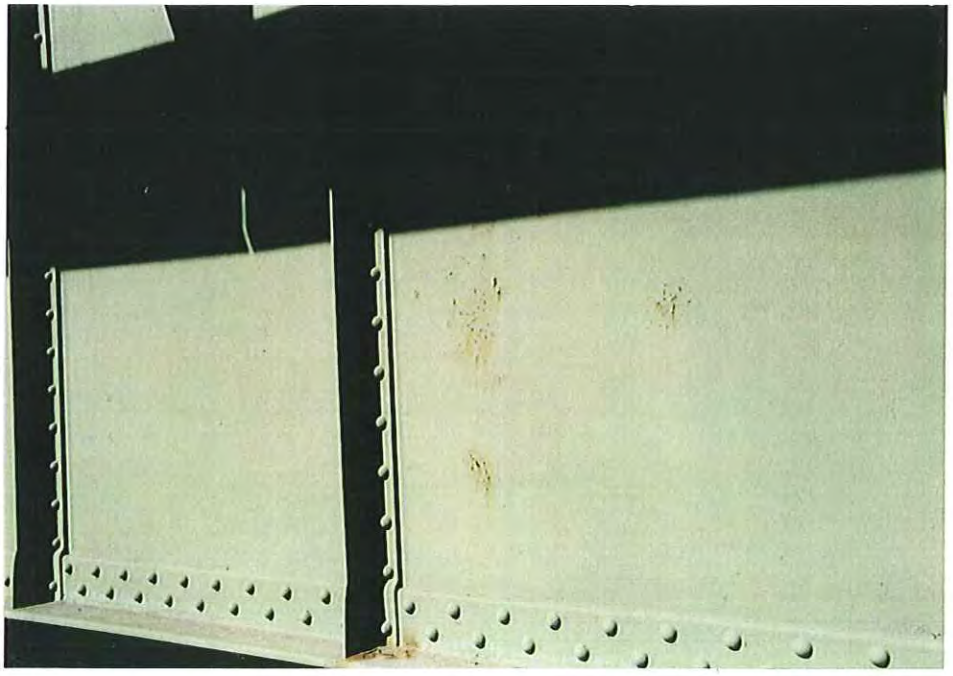
Photograph No. 63
This photo shows steel where the approach span and exit ramp meet on the east end of the bridge.

Photograph No. 64
A close-up of Photo No. 63.

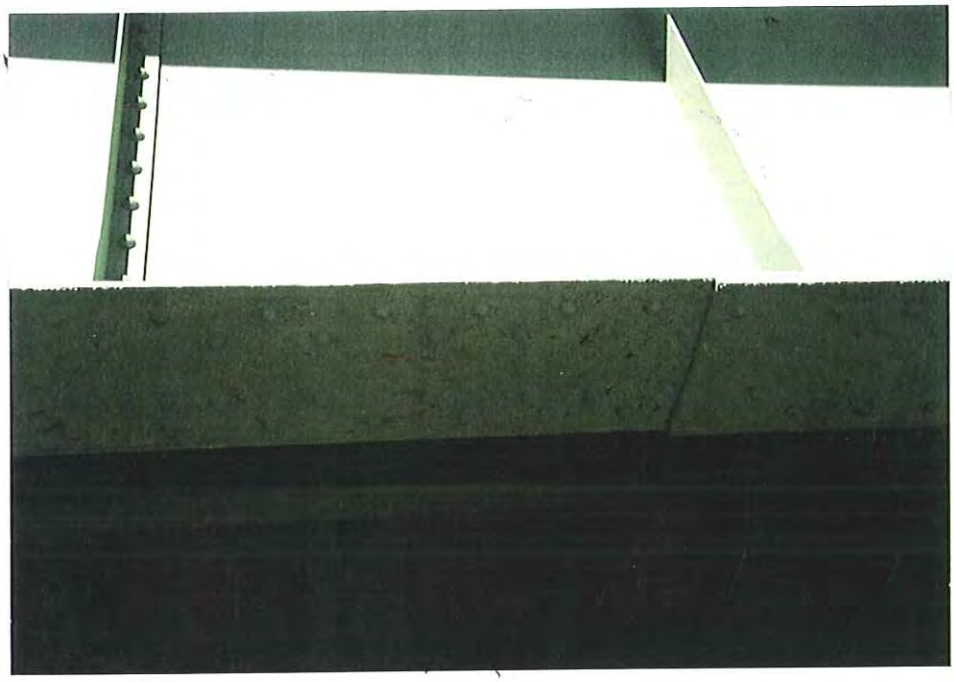
Photograph No. 65
Poor coating adhesion is shown on the fascia of Span 41, the exit ramp. Note four coating layers totaling 10 to 11 mils.



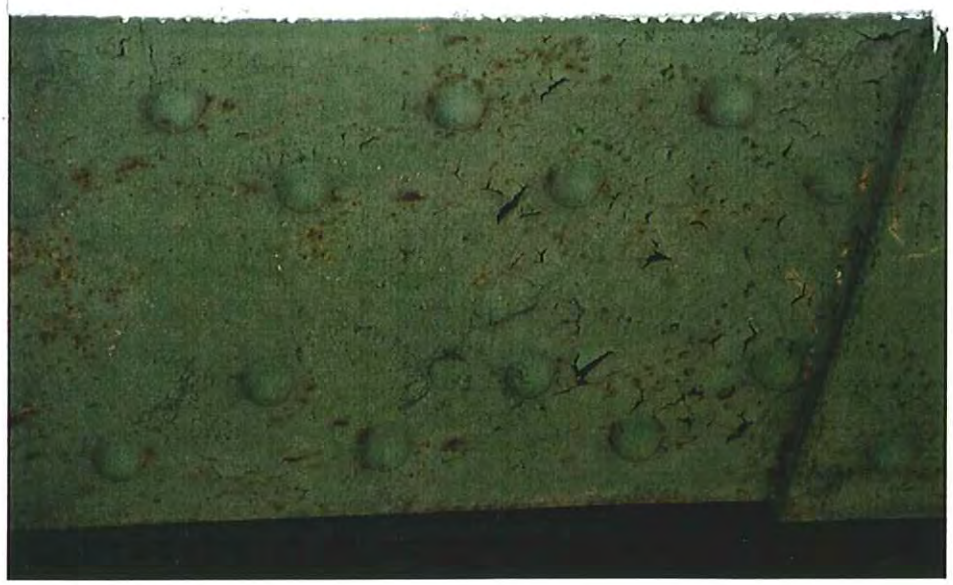
Photograph No. 66
This photo shows the poor condition of the coating on the south fascia of the exit ramp. Note the coating is beginning to spontaneously fracture in patches. This condition was observed on many areas of the bridge.



Photograph No. 67
Cracked and checked coating on the bottom flange of a connecting plate on the exit ramp.



Photograph No. 68
Close-up of Photo No. 67



Photograph No. 69
This shows an area on the exit ramp where islands of old paint were not removed prior to the previous maintenance painting. Adhesion is fair to poor where old coating was overcoated.

Photograph No. 70
This shows the very poor adhesion on a diaphragm in Span 29. Note how fracture occurred in the orange primer.

Photograph No. 71
This photograph shows very poor adhesion (0A), and lists the thickness of the various coating layers. Note fracture is occurring in the brittle orange primer.

Photograph No. 72
This close-up shows the brittle condition of the coatings and accompanying micro-checking. Micro-checking was observed on many areas of the bridge, especially on the webs of the girder spans and simple beam spans.

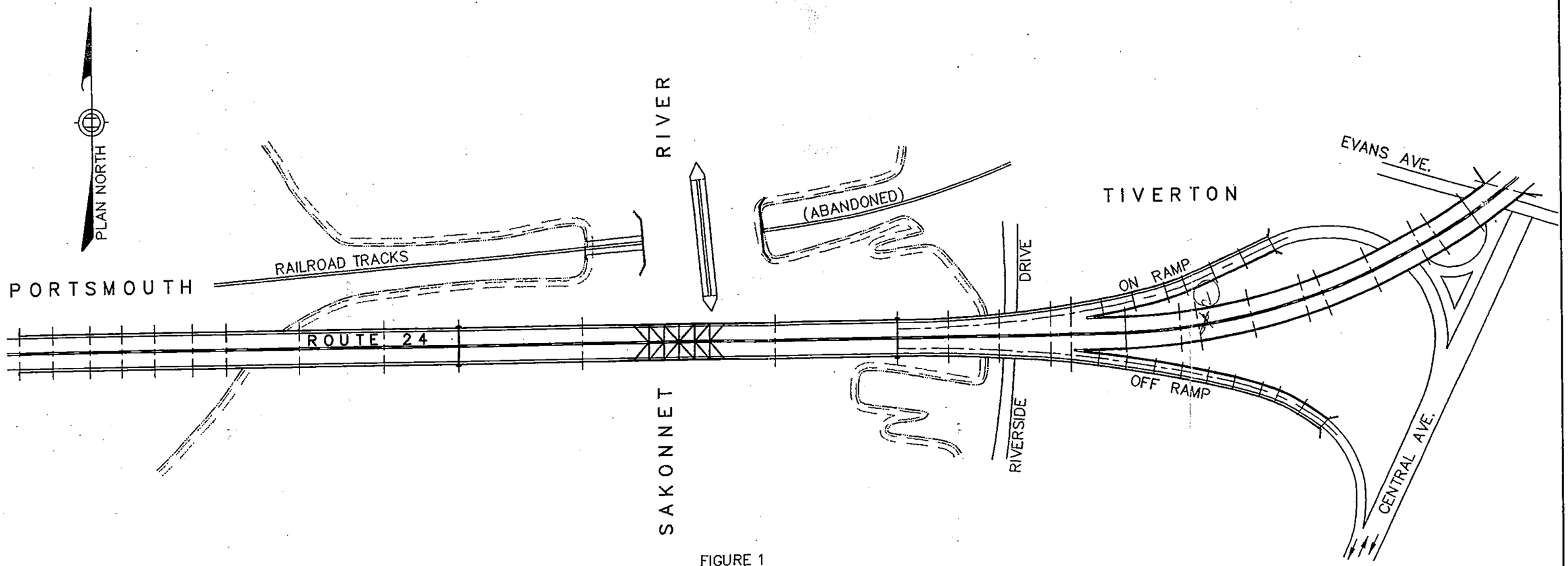


FIGURE 1
LOCATION PLAN

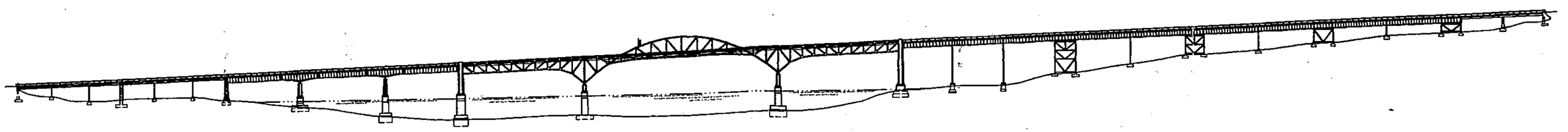


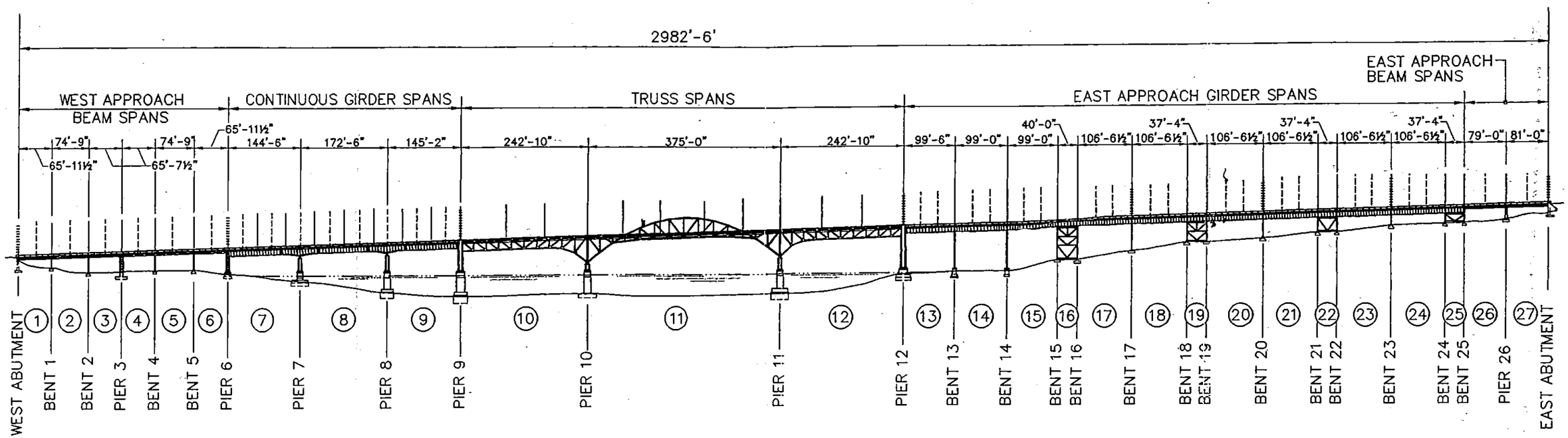
FIGURE 2
ELEVATION

FIGURES 1 AND 2

COMMONWEALTH
ENGINEERS & CONSULTANTS, INC.
260 WEST EXCHANGE STREET
PROVIDENCE, RI 02903

← PORTSMOUTH

TIVERTON →



MAINLINE STRUCTURE - SOUTH ELEVATION

NOTE: ON AND OFF RAMP NOT SHOWN.

LEGEND:

(X) =SPAN NUMBERING

——— EXPANSION JOINT

- - - - - - CONSTRUCTION/CONTRACTION JOINT

⊣⊢⊣⊢⊣⊢ EXPANSION DAM/FINGER JOINT

FIGURE 3

COMMONWEALTH
ENGINEERS & CONSULTANTS, INC.
260 WEST EXCHANGE STREET
PROVIDENCE, RI 02903