

November 25, 2014

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATION
DEPARTMENT OF ADMINISTRATION

DIVISION OF PURCHASES BID NO. 2015028

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

RHODE ISLAND CONTRACT NO.2015-CB-028

FEDERAL-AID PROJECT NO. FAP Nos: BHO-0483(001)

Bridge Nos. 483-486 Pier Cap Replacement and Miscellaneous Bridge Repairs

US Route 1 Bridge No. 483, 484, 485 and 486

CITY/TOWN OF South Kingstown

COUNTY OF WASHINGTON

NOTICE TO PROSPECTIVE BIDDERS

ADDENDUM NO. 2 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. Plans

1. Sheet No. 5 Job Specific Notes 1

Delete Sheet No. 5 in its entirety and replace with revised Sheet No. 5 (R-1) attached to this Addendum No. 2. Concrete materials have been revised and Concrete Notes 1 and 4 have been revised.

2. Sheet No. 10 Temporary Support System Bridge No. 484 and 486

Delete Sheet No. 10 in its entirety and replace with revised Sheet No. 10 (R-1) attached to this Addendum No. 2. Section D has been revised.

3. Sheet No. 22 Utility Relocation- Bridge No. 484

Delete Sheet No. 22 in its entirety and replace with revised Sheet No. 22 (R-1) attached to this Addendum No. 2. Notes 2 and 3 have been revised.

4. Sheet No. 25 Pier Elevations- Bridge No. 484 SB

Delete Sheet No. 25 in its entirety and replace with revised Sheet No. 25 (R-1) attached to this Addendum No. 2. Fiber wrap has been added to the pier caps.

5. Sheet No. 34 Pier Elevations- Bridge No. 485 NB

Delete Sheet No. 34 in its entirety and replace with revised Sheet No. 34 (R-1) attached to this Addendum No. 2. Fiber wrap has been added to the pier caps.

6. Sheet No. 41 Pier Elevations- Bridge No. 486 SB
Delete Sheet No. 41 in its entirety and replace with revised Sheet No. 41 (R-1) attached to this Addendum No. 2. Fiber wrap has been added to the pier caps.
7. Sheet No. 42 Pier Elevations- Bridge No. 486 NB
Delete Sheet No. 42 in its entirety and replace with revised Sheet No. 42 (R-1) attached to this Addendum No. 2. Fiber wrap has been added to the pier caps.
8. Sheet No. 47 Concrete Repair Details
Delete Sheet No. 47 in its entirety and replace with revised Sheet No. 47 (R-1) attached to this Addendum No. 2. "Typical Concrete Structure Surface Elevation" title has been revised and Surface Preparation for Concrete Repair Note 5 has been removed.
9. Sheet No. 48 Beam Repair Details
Delete Sheet No. 48 in its entirety and replace with revised Sheet No. 48 (R-1) attached to this Addendum No. 2. Limits of bridge deck repair have been added to "Bridge Deck at Joint Repair Detail."
10. Sheet No. 50 Asphaltic Expansion Joint System
Delete Sheet No. 50 in its entirety and replace with revised Sheet No. 50 (R-1) attached to this Addendum No. 2. Limits of bridge deck repair have been added to Detail 5 and Section I.
11. Sheet No. 51 Fixed Joint Details
Delete Sheet No. 51 in its entirety and replace with revised Sheet No. 51 (R-1) attached to this Addendum No. 2. Proposed limits of joint sealant and closed cell foam have been revised in "Fixed Joint at Abutment" and Detail 10.

B. Contract Documents

1. Specification/Job Specific
 - a. Delete Index Page JS-i in its entirety and replace with revised Index Page JS-i (R-1) attached to this Addendum No. 2. Item Code 714.9901 has been removed.
 - b. Delete Page JS-50 in its entirety and replace with revised Page JS-50 (R-1) attached to this Addendum No. 2. Item Code 714.9901 has been removed.
 - c. Delete Page JS-62 in its entirety and replace with revised Page JS-62 (R-1) attached to this Addendum No. 2. Language for Item Codes 817.9901 to 817.9904 has been revised under Submittals.
 - d. Delete Page JS-63 in its entirety and replace with revised Page JS-63 (R-1) attached to this Addendum No. 2. Language for Item Codes 817.9901 to 817.9904 has been revised under Procedures for Application.
 - e. Delete Page JS-64 in its entirety and replace with revised Page JS-64 (R-1) attached to this Addendum No. 2. Language for Item Codes 817.9901 to 817.9904 has been revised to “Quality Control Plan”.
 - f. Delete Page JS-68 in its entirety and replace with revised Page JS-68 (R-1) attached to this Addendum No. 2. Language for Item Codes 817.9901 to 817.9904 has been revised under Working Drawings.
 - g. Delete Page JS-69 in its entirety and replace with revised Page JS-69 (R-1) attached to this Addendum No. 2. Requirement for adhesive sample for Item Codes 817.9901 to 817.9904 has been removed and language regarding sample testing procedure and installation procedure has been revised.
 - h. Delete Page JS-71 in its entirety and replace with revised Page JS-71 (R-1) attached to this Addendum No. 2. Language for Item Codes 817.9901 to 817.9904 has been revised under “4. Inspection for Debonding “ and “6. Inspection for Adhesion.”
 - i. Delete Page JS-75 in its entirety and replace with revised Page JS-75 (R-1) attached to this Addendum No. 2. Use of a curing compound for Item Codes 817.9901 to 817.9904 has been removed and language specifying continuous moist curing has been added.

C. Distribution of Quantities

1. Page 7

Delete Page 7 in its entirety and replace with revised Page 7 (R-1) attached to this Addendum No. 2. Item Code 808.1642 quantities have been revised.
2. Page 8

Delete Page 8 in its entirety and replace with revised Page 8 (R-1) attached to this Addendum No. 2. Item Code 808.1642 quantities have been revised.
3. Page 15 (R-1)

Delete Page 15 (R-1) in its entirety and replace with revised Page 15 (R-2) attached to this Addendum No. 2. Item Code 818.9901 quantities have been revised.

4. Page 15a

Delete Page 15a in its entirety and replace with revised Page 15a (R-1) attached to this Addendum No. 2. Item Code 818.9901 quantities have been revised.



RI Department of Transportation
Chief Engineer

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEET
1	R.I.	BHO-0483(001)	2015	48	60

R-1

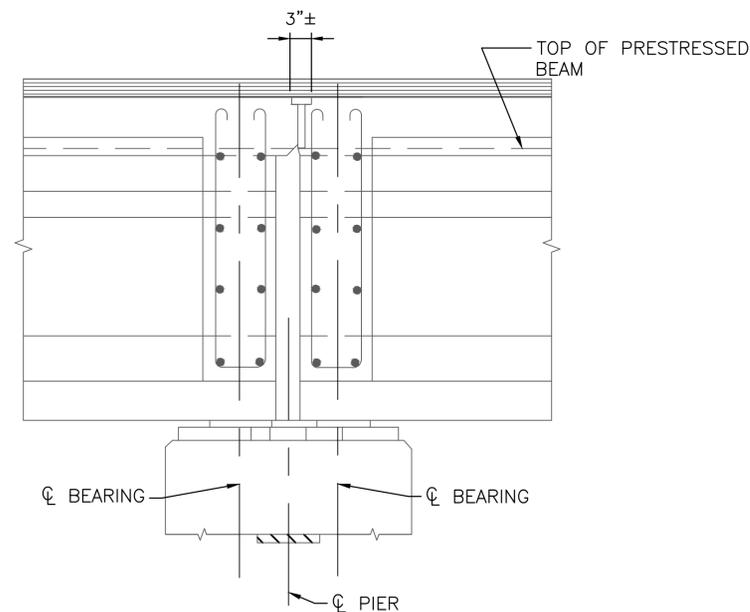
NOTES:

BRIDGE DECK AT JOINT REPAIRS FOR BRIDGE 483

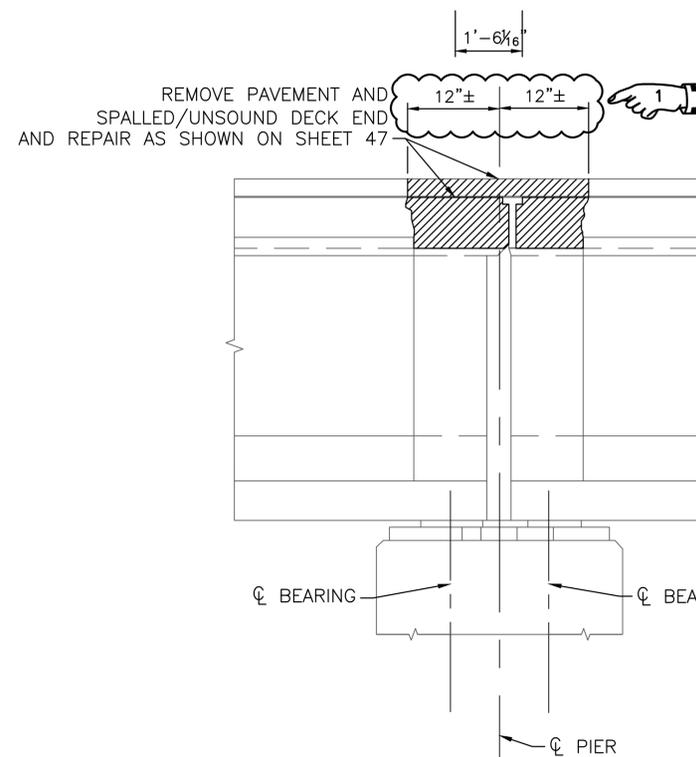
- BRIDGE DECK AT JOINT REPAIR WORK SHALL BE DONE FROM ABOVE THE DECK AND WILL REQUIRE TRAFFIC CONTROL.
- DECK REMOVAL AND REPLACEMENT, AS REQUIRED, TO INSTALL ASPHALTIC PLUG JOINT WILL BE PAID FOR UNDER THE ITEM "RAPID SETTING CONCRETE BRIDGE DECK REPAIR (FULL DEPTH REMOVAL)" SEE SPECIAL PROVISIONS.
- DURING THE REMOVAL OF CONCRETE AT THE DETERIORATED JOINT, IF THE EXTENT OF DETERIORATION EXCEEDS THE EXPANSION JOINT WIDTH (MORE THAN 20") THE CONTRACTOR SHALL TEMPORARILY STOP THE DEMOLITION WORK AND NOTIFY THE ENGINEER IN CHARGE. TEMPORARY SUPPORTS SHALL BE PROVIDED IF THE CONDITIONS ARE NOT SAFE IN THE OPINION OF THE ENGINEER IN CHARGE.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE A FULLY FUNCTIONAL ASPHALTIC EXPANSION JOINT AT EACH PIER. SEE SHEET 50 FOR ASPHALTIC EXPANSION JOINT SYSTEM DETAILS.

END OF BEAM REPAIRS

- ALL END OF BEAM REPAIR WORK SHALL BE DONE FROM UNDERSIDE OF THE BRIDGE AFTER THE PIER CAP HAS BEEN DEMOLISHED AND PRIOR TO RECONSTRUCTION OF PIER CAP.
- THE CONTRACTOR SHALL REMOVE ALL DETERIORATED CONCRETE AT THE END OF BEAMS. CARE SHALL BE EXERCISED TO AVOID DAMAGE TO THE EXISTING VERTICAL SHEAR REINFORCING BARS, OTHER BARS AS WELL AS THE PRESTRESSED STRANDS. ONLY 15LB HAMMER SHALL BE USED.
- DURING THE REMOVAL OF DETERIORATED CONCRETE AT THE END BEAMS, IF ANY EXPOSED, CORRODED REBAR BECOMES 25% UNUSABLE, THE CONTRACTOR SHALL INSTALL A NEW REBAR WITH THE SAME SIZE AND SHAPE. REFER TO ORIGINAL CONSTRUCTION DRAWINGS FOR REINFORCING DETAILS.
- IT IS ASSUMED THE BRIDGE DECK JOINT REPAIRS WILL BE PERFORMED WHEN THE DECK IS EXPOSED DURING THE ASPHALTIC EXPANSION JOINT INSTALLATION. IF THE CONTRACTOR CHOOSES TO PERFORM THE BEAM REPAIRS PRIOR TO THAT, TEMPORARY WEARING SURFACE SHALL BE INSTALLED AS DIRECTED BY THE ENGINEERING AT NO ADDITIONAL EXPENSE TO THE STATE.

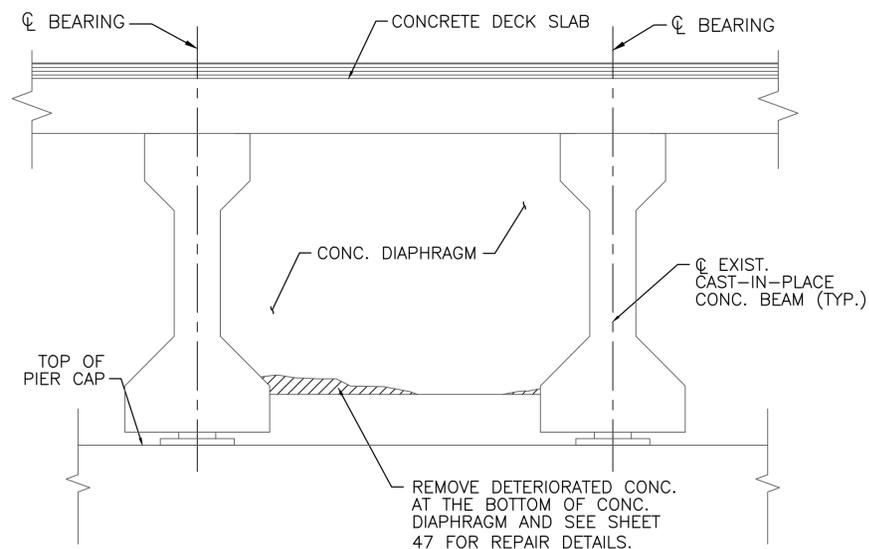


**END OF BEAM
TYPICAL EXISTING CONDITION**
SCALE: 1/2" = 1'-0"

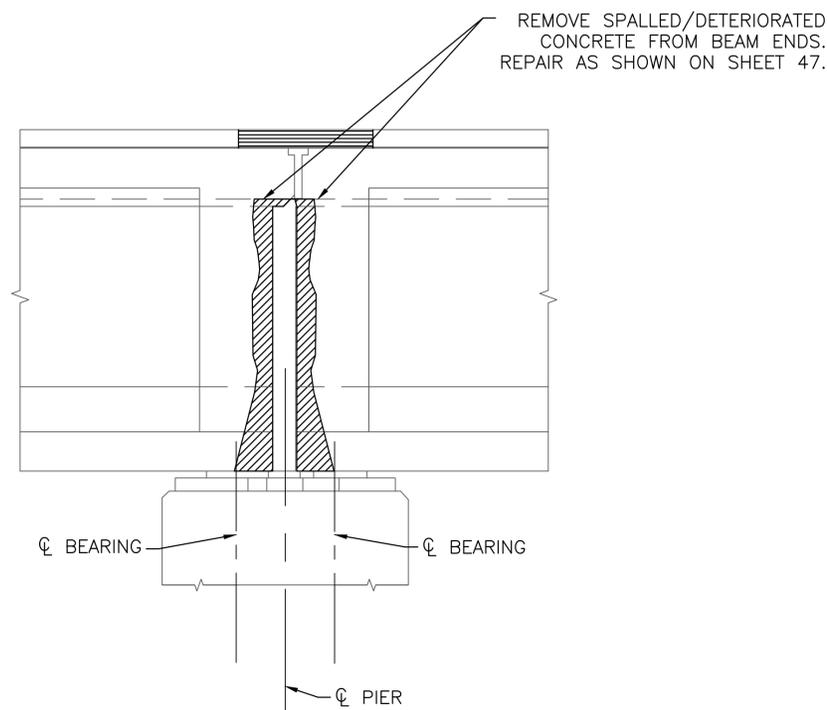


BRIDGE DECK AT JOINT REPAIR DETAIL
REPAIR SHALL BE DONE FROM TOP OF THE DECK

TYPICAL REPAIR
SCALE: 1/2" = 1'-0"



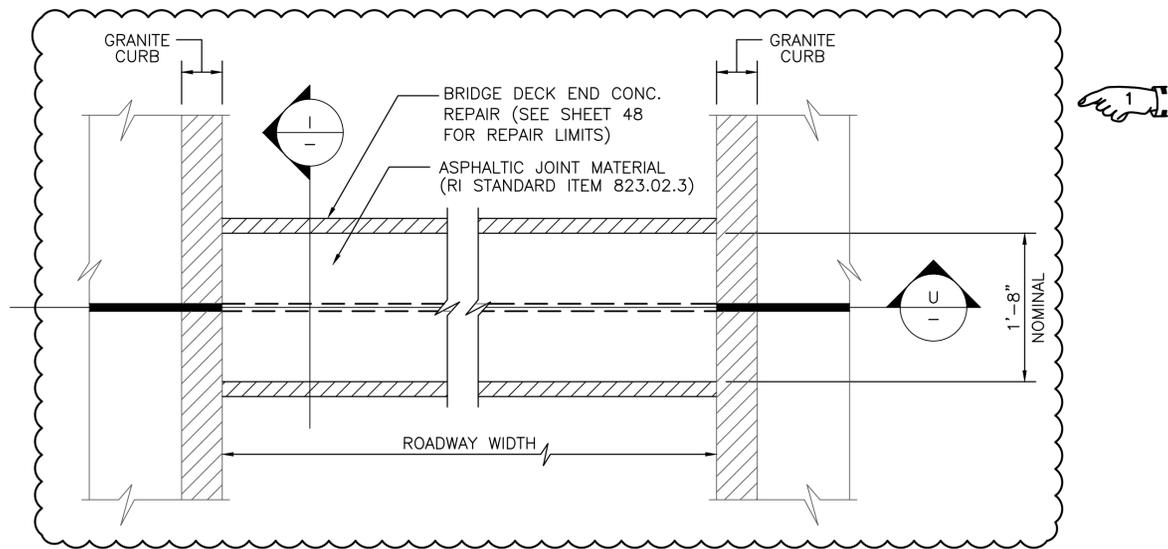
TYPICAL INTERIOR DIAPHRAGM
SCALE: 3/4" = 1'-0"



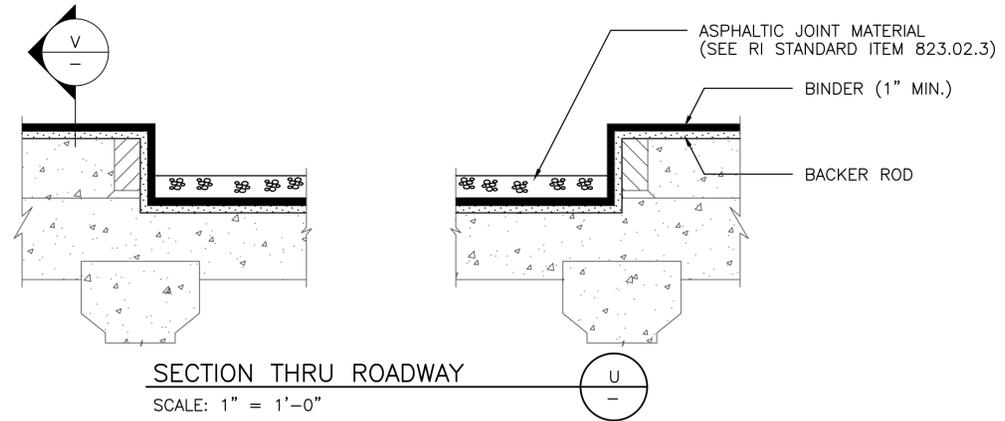
END OF BEAM REPAIR DETAIL
REPAIR SHALL BE DONE FROM UNDERSIDE OF THE BRIDGE DECK

REVISIONS			RHODE ISLAND DEPARTMENT OF TRANSPORTATION	
NO.	DATE	BY	BRIDGE NOs. 483-486 PIER CAP	
			REPLACEMENT AND MISCELLANEOUS BRIDGE REPAIRS	
			SOUTH KINGSTOWN/NARRAGANSETT, RHODE ISLAND	
			BEAM REPAIR DETAILS	
			CHECKED BY BK	DATE _____ SCALE AS NOTED





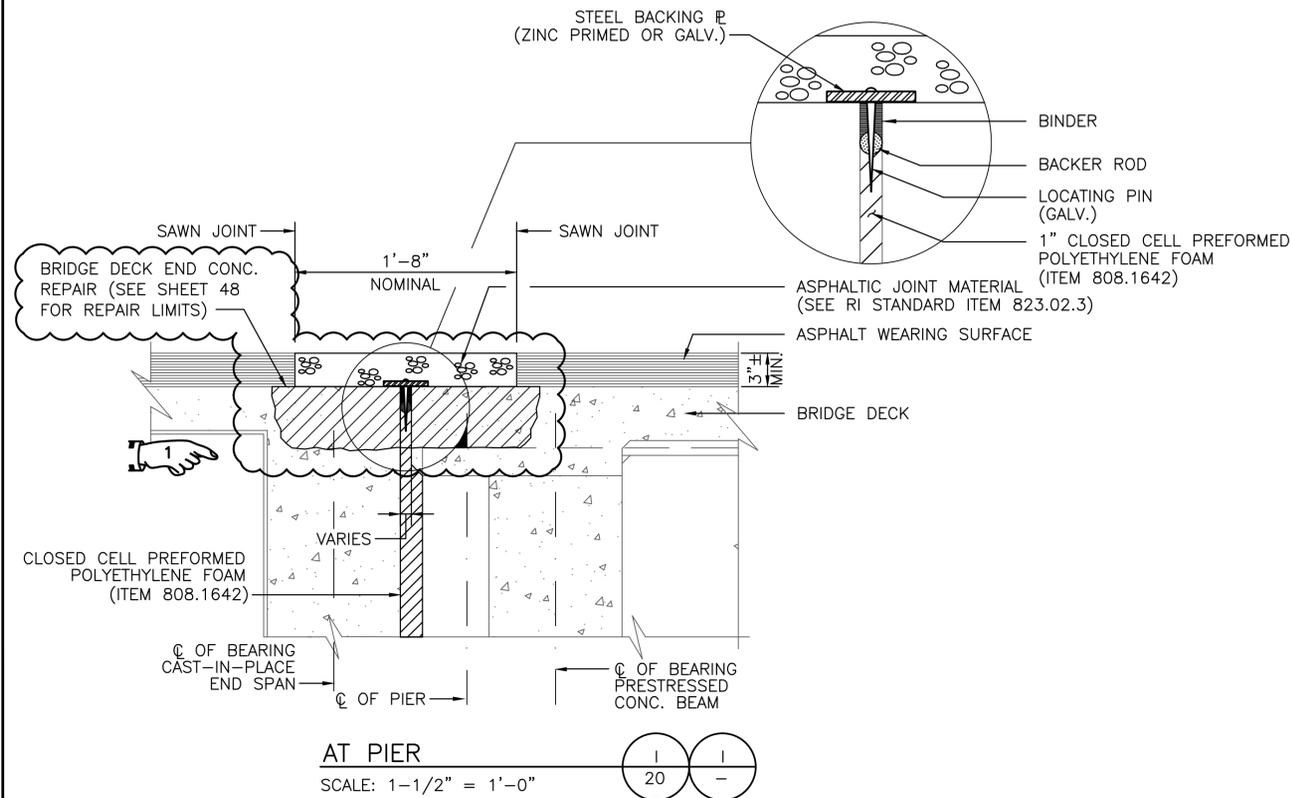
EXPANSION JOINT DETAIL AT CURBS 5
SCALE: 1" = 1'-0"



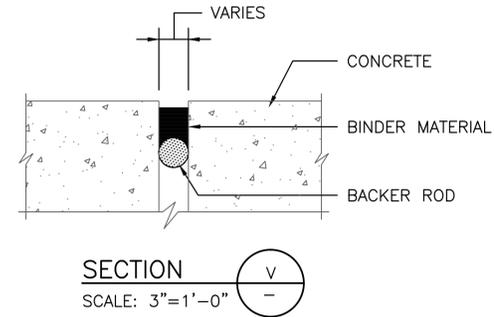
SECTION THRU ROADWAY U
SCALE: 1" = 1'-0"

NOTE:

1. SEE RI STANDARD ITEM 823.1750 FOR SPECIFICS ON MATERIALS AND CONSTRUCTION METHODS.

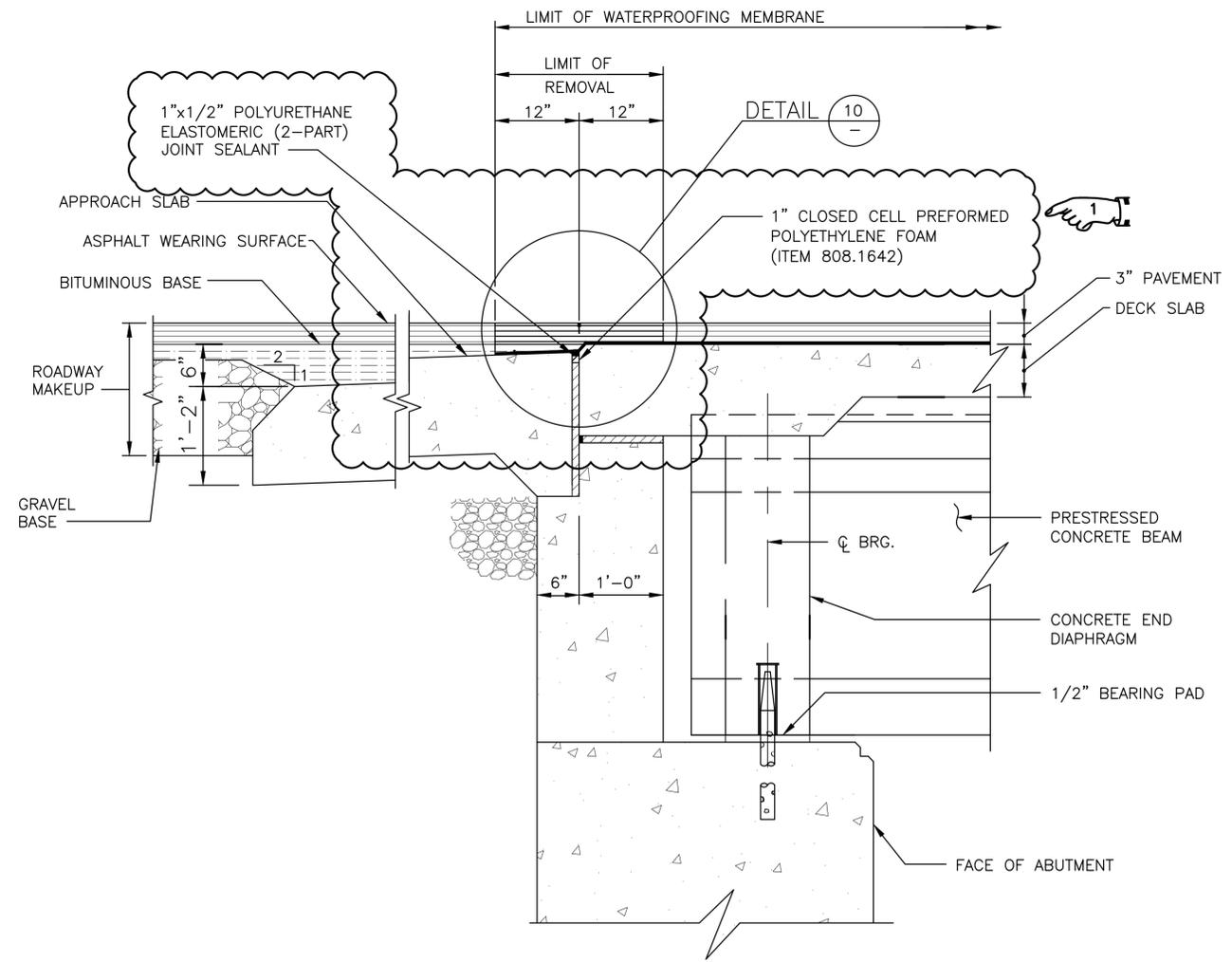


AT PIER 1 1
SCALE: 1-1/2" = 1'-0"

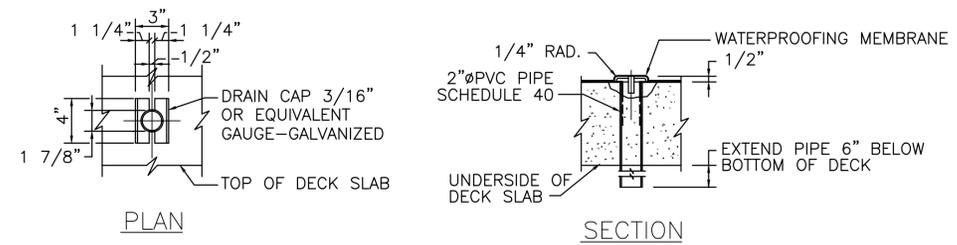


SECTION V
SCALE: 3" = 1'-0"

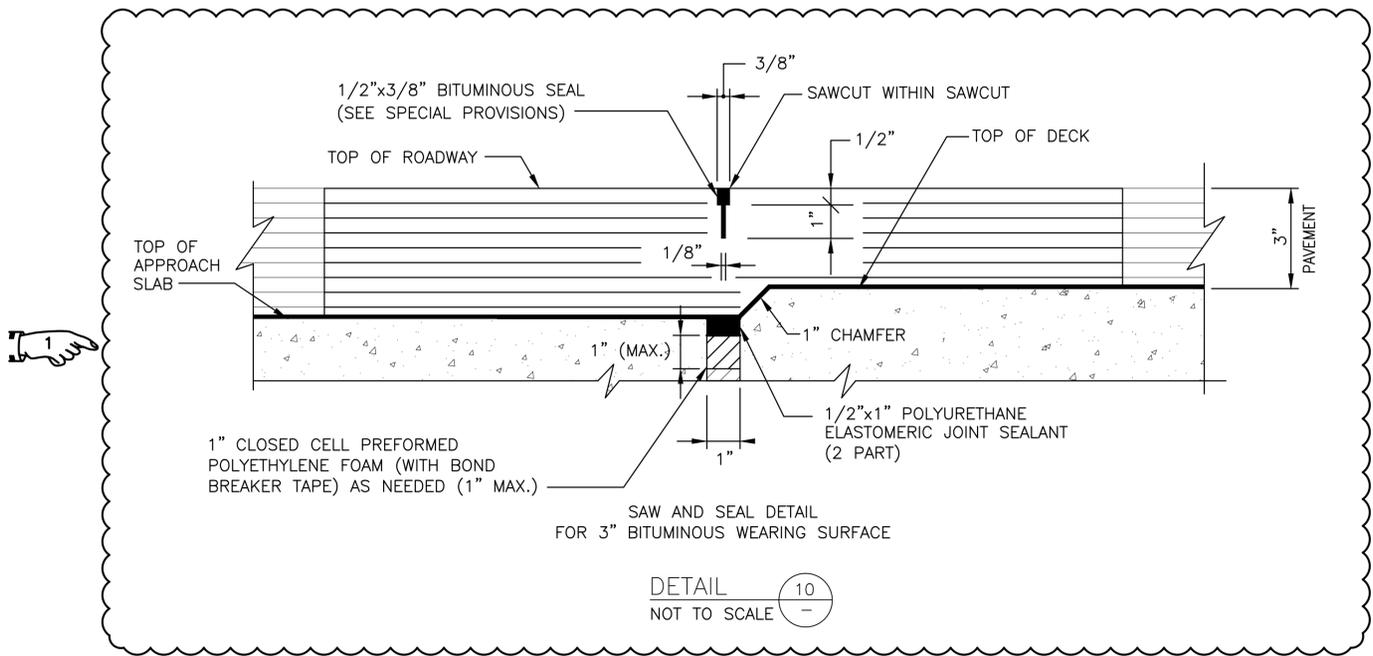
REVISIONS			RHODE ISLAND DEPARTMENT OF TRANSPORTATION BRIDGE NOS. 483-486 PIER CAP REPLACEMENT AND MISCELLANEOUS BRIDGE REPAIRS SOUTH KINGSTOWN/NARRAGANSETT, RHODE ISLAND ASPHALTIC EXPANSION JOINT SYSTEM CHECKED BY <u> BK </u> DATE <u> </u> SCALE <u>AS NOTED</u>
NO.	DATE	BY	



FIXED JOINT AT ABUTMENT
SCALE: 3/4" = 1'-0"



SUBPAVEMENT DRAIN
1 1/2" = 1'-0"



DETAIL 10
NOT TO SCALE

REVISIONS			RHODE ISLAND DEPARTMENT OF TRANSPORTATION BRIDGE NOs. 483-486 PIER CAP REPLACEMENT AND MISCELLANEOUS BRIDGE REPAIRS SOUTH KINGSTOWN/NARRAGANSETT, RHODE ISLAND FIXED JOINT DETAILS	
NO.	DATE	BY		

CHECKED BY BK DATE SCALE AS NOTED

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938.1000	Price Adjustments	JS-77

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SUBMITTALS:

The Contractor shall submit the design calculations, working drawings, QC plan, supporting details and method of installation to the Engineer for approval. Design the composite system per ACI 440.2R-02 and ICBO ES AC125 design criteria, to achieve the structural performance shown on this specification. Calculations shall conform to requirements set forth in both ACI 440.2R-02 and the ICBO ES Acceptance Criteria (AC125) and be based on the design modulus and associated area of the composite to be installed. Design values must be lower than the calculated mean determined from the test results received from the ASTM D3039 field test specimens. All submittals shall be stamped by a Professional Engineer licensed in the State of Rhode Island.

The table below shows the minimum mechanical properties of the cured composite system used for the project design. FRP systems shall be equated based on the relative stiffness in terms of the tested modulus and associated gross laminate area ($E \times A$). Net fiber values shall not be used for design or testing requirements:

PROPERTY	Unidirectional Carbon Composite System Requirement	Unidirectional Glass Composite System Requirement	ASTM TEST METHOD
Ultimate Tensile Strength in primary fiber direction, min.	100,000 psi	60,000 psi	D 3039
Ultimate Breaking Load in primary fiber direction, min.	4,000 lb/in width	2,900 lb/in width	D 3039
Elongation (%): Minimum Maximum	0.8 1.7	1.5 4.0	D 3039
Tensile Modulus, min.	8,900 ksi	3,000 ksi	D 3039
Stiffness in primary fiber direction based on the unit width of one-layer of cured FRP System. Modulus times measured area ($E \times A$)	350 kips/inch	150 kips/inch	D 3039
Corresponding Thickness per layer	0.04 inches	0.05 inches	N/A

Working Drawings: The working drawings submitted shall contain details of the concrete surface preparation, dry sheet, fabric or winding thickness; the number of wraps or layers required; orientation of fibers; tolerances; finish coating system; installed thickness of the composite system; fiber volume, details of joints and ends of fiber construction; details of any transition in composite thickness; plan for curing, if required; methods for fabrication of test samples, the name of the independent testing facility and all information required for the proper construction of the system.

Working drawings shall include the precautions that are necessary to protect workers and the public from hazardous materials that may be present or generated during composite installation. Measures to be taken in case of an exothermic reaction shall also be specified.

The working drawings shall also include the material supplier's name, material safety data sheets (MSDS) and commercial material designation for all materials used. The following properties for the resin shall be included with the working drawings: mix ratio by weight and volume, pot life, shelf life, resin gel time at proposed air temperatures, mixing and application temperature ranges. Any environmental conditions (temperature, humidity, etc.) and curing procedures required for installation shall be noted on the working drawings. All materials shall be certified by the responsible manufacturer or supplier.

The design of the FRP composite system should be developed in consultation with the system manufacturer.

Qualifications: The manufacturer/supplier must be pre-qualified by RIDOT or its representative for the FRP system after providing the following necessary information:

- a. System data sheets and MSDSs for all components of the FRP system.
- b. A comprehensive hands-on training program for the FRP system to qualify Contractors/applicators. Written verification from the system manufacturer that the applicators have received the required certifications and training.

The Contractor/applicator must be pre-qualified by the owner or its representative for the FRP system after providing the following necessary information:

- a. The composite system shall be installed by a Contractor certified by the manufacturer by means of written verification.
- b. A certificate of completed training from the manufacturer/supplier for at least one field representative who will be present for each of the work zones that is active concurrently throughout the project.

The Engineer of Record shall have the right to approve or reject the personnel qualifications as submitted. If the Contractor substitutes unauthorized personnel for authorized personnel during construction, all work will be suspended immediately until permission is given by the Engineer to continue the work.

Quality Control Plan: The Contractor shall be responsible for the quality control of all materials and processes in the project. It shall include specific procedures for personnel safety, tracking and inspection of all FRP components prior to installation, inspection of all prepared surfaces prior to FRP application, inspection of the work including necessary tests for approval, repair of defective work, photo documentation and clean-up. Any part of the work that fails to comply with the requirements of the contract documents shall be rejected by the Engineer and shall be remedied or removed and replaced by the Contractor at his own expense to be in full compliance with the contract documents.

The Contractor shall demonstrate the adequacy of his methods, material and equipment by successfully repairing one column in accordance with this specification's requirements. Failure by the Contractor to demonstrate to the Engineer the adequacy of methods, material and equipment shall be reason for the Engineer to require alterations in equipment, material and/or method by the Contractor to eliminate unsatisfactory results. Any additional trials required demonstrating the adequacy of altered methods, material or construction equipment shall be at the Contractor's expense. Once approval has been given for a full scale operation, no changes will be permitted in the methods, material or equipment used to repair the remaining columns and without written approval of the Engineer.

CONSTRUCTION METHODS: The FRP wrap material shall be applied to the columns only after the concrete repair material has been fully cured.

After the concrete repair is performed on the column, additional vertical FRP shall be installed at the repaired area of column and then the entire column be fully encapsulated with a FRP transverse hoop layer(s).

The storage and handling and application of materials for the FRP composite work shall be in accordance with the manufacturer's recommendations. Materials shall be protected from dirt, moisture, direct sunlight, chemicals, extreme temperatures, fire and physical damage. Materials shall be stored in a protected area at a temperature between 35°F and 100°F only if not otherwise specified by the manufacturer.

All components of the FRP system, especially epoxy resins and adhesives, must be handled with care to avoid safety hazards, including but not limited to skin irritation and sensitization and breathing vapors and dusts. Mixing resins shall be monitored to avoid fuming and inflammable vapors, fire hazards, or violent boiling. The Contractor is responsible for ensuring that all components of the FRP system at all stages of work conform to the local, state, and federal environmental and worker's safety laws and regulations.

Deliver epoxy materials in factory-sealed containers with the manufacturer's labels intact and legible with verification of date of manufacture and shelf life.

Fabric sampling procedure (12" x 12" or as required): From a standard epoxy mix, saturate fabric according to specified fiber-resin ratio. On a smooth, flat, level surface covered with polyethylene sheeting, or 16 mil plastic film, prime with epoxy resin. Prepare sample by placing two layers of saturated fabric with primary fibers oriented in the same direction. Apply additional topping of epoxy. Cover with plastic film and squeegee out all bubbles. Samples shall be stored in a sample box and not moved for a minimum 48 hours after casting. The prepared, identified samples shall be given to a pre-approved testing laboratory. Laboratory shall precondition samples for 48 hours at 140°F before testing (see Testing Section for testing requirements). A sample shall be provided for RIDOT testing. Fabric samples shall be fabricated by the Installer in the presence of the Engineer.

Installation Procedures:

1. Prepare surface as required, including corner preparation.
2. Remove dust and debris by hand or with compressed air as per specification.
3. Clean up and protect area adjacent to element.
4. Using a roller or trowel, apply one prime coat of thickened epoxy resin to the entire concrete surface (2 mil. min.) to which the FRP will be applied. Allow primer to become tacky to the touch.
5. Fill any uneven surfaces or recesses with thickened epoxy.
6. Saturate fabric with epoxy matrix through properly set saturator.
7. Apply saturated fabric to concrete surface by hand lay-up, using methods that produce a uniform, constant tensile force that is distributed across the entire width of fabric. Under certain application conditions, the system may be placed entirely by hand methods assuring a uniform, even final appearance. Gaps between composite bands may not exceed 1/2" width in the fabric's transverse joint unless otherwise noted on project drawings. A lap length of at least 6" is required at all necessary overlaps in the primary fiber direction of the fabric.
8. Apply subsequent layers, continuously or spliced, until designed number of layers is achieved, per project drawings.
9. Using a roller or hand pressure, insure proper orientation of fibers, release or roll out entrapped air, and ensure that each individual layer is firmly bedded and adhered to the preceding layer or substrate.
10. Apply a final coat of thickened epoxy. Detail all fabric edges, including butt splice, termination points, and jacket edges, with epoxy.
11. Finish: All exterior applications shall be protected with a 10-15 mil thick coat of thickened epoxy. All edges and seams must be feathered. Use system as directed by manufacturer. Paint as specified between 24 and 72 hours after final application of epoxy. If after 72 hours the epoxy is cured, the surface must be roughened by sanding or brush blasting.
12. System may incorporate structural fasteners but limitations and detailing must be verified with composite system manufacturer.

Installation procedures may be modified to achieve maximum results, subject to approval of the Engineer. Procedure modifications shall be discussed with the Engineer and RIDOT prior to implementing the modifications. The system shall be installed in accordance with the manufacturer's recommendations and any modifications to the installation procedures shall be approved by the composite system designer.

Curing of composite system: Epoxy curing temperatures shall be maintained in the temperature range designated for the formulation used. Temperature cure ranges and times to be determined by manufacturer. The composite system shall be protected from contact by moisture for a minimum period of 24 hours.

Testing:

The FRP composite shall have at least the number of layers and thicknesses as shown on the design calculations and working drawings. The dimensions shall be verified, after application and cure, by taking 1/2 inch cores for control testing. One core shall be taken by the Contractor on each structural component at the locations determined by the Contractor's engineer that will not jeopardize the strength of the installation. Care shall be taken during coring operations to ensure that undamaged cores are obtained, and that minimal damage occurs to the adjacent composite and structural component. All cores shall be placed in labeled and sealed polyethylene bags, and furnished to the Engineer. Tests shall conform to ASTM procedures and manufacturer's published testing methods. Core holes shall be filled with a system-compatible resin and smoothed flush prior to painting the finished composite surface.

A "sample batch" shall consist of two FRP composite test panel of 12" x 12" (minimum) cured in the field in the same manner as the installation. A minimum of one sample batch shall be made daily. RIDOT testing requirement: The resin manufacturer shall prepare two resin samples (approximately 3" diameter by 1/2" depth with a level top surface) properly mixed and cured to the Engineer as reference samples, prior to start of FRP application. At minimum, once per day, per batch of resin, the Installer shall fabricate one resin sample (approximately 3" diameter by 1/2" depth with a level top surface) in the presence of the Engineer. The Engineer shall test these resin samples after the specified curing time in accordance with ASTM D2240 and compare to the manufacturers' reference samples. The test panels shall be placed in labeled and sealed polyethylene containers prior to shipment to the testing facility and RIDOT. The Contractor shall be responsible for the test samples with proper documentation.

The Contractor shall engage an independent testing laboratory subject to the approval of the Engineer and RIDOT. The testing laboratory shall test panels and cores to verify the dimensions, properties and physical characteristics upon which the Contractor's Engineer has based the FRP composite design. Testing results shall be made available within 1 week of sample submission. The following tests shall be used by the laboratory to verify properties:

and coating; observations of the progress of the cure of resins; conformance with installation procedures; adhesion test results of bond strength, failure mode, and

location; FRP properties from test of field sample panels; location and size, of any delaminations or air void; and the general progress of work.

3. Inspection of Fiber Orientation. Fiber or ply orientation, fiber kinks, and waviness will be examined by visual inspection for conformity to the working drawings. Tolerance will follow installation of FRP system. Nonconforming FRP area will be removed and repaired.
4. Inspection for Debonding. After the manufacturer's specified time, for the initial curing of the resin, a visual inspection and an acoustic tap test (with a ball peen hammer) of the surface will be performed for any swelling, bubbles, voids, or delaminations. If an air pocket is suspected, an acoustic tap test (light tap) will be carried out with a ball peen hammer to identify delaminated areas by sound, with at least one per 1 ft². Defects smaller than 1/4 in. in diameter will require no corrective action. Defects larger than 1/4 inch in diameter will be repaired. No excessive force shall be used when performing a sounding test.
5. Inspection for Cure of Resin. The relative cure of resin in FRP systems will be examined by RIDOT's hardness test as described under Testing section or by laboratory testing of sample panels or resin-cup samples using ASTM D3418. A reference sample of properly cured resin should be used as a basis for comparison. Follow recommendations of the resin manufacturer for acceptance criteria. If the cure of resin is found unacceptable, the entire area will be marked and repaired.
6. Inspection for Adhesion: After the manufacturer's specified time, for the initial cure of the resin and before applying the protective coating, a direct pull-off test will be performed following ASTM D4541 to verify tensile bond between the FRP system and the concrete. Test locations and sampling frequency shall be recommended by the Design Engineer. At a minimum, one pull-off test will be performed at each beam location. Inspect the failure surface of the core specimen to ensure that the failure surface is by cohesive failure within concrete. Failure at the bond line at tensile stresses below 200 psi is unacceptable. If one or more of the pull-off tests is found unacceptable, the work will be rejected and repaired.

Repairs: All defects, including bubbles, delaminations, and fabric tears, or as specified by the Owner or Engineer, shall be repaired. Two types of repairs shall be performed:

1. Small defects (on the order of 1/4" to 1 1/4" diameter) shall be injected or back filled with epoxy.
2. Large defects shall be repaired as required by the manufacturer's recommendations.

Placing and Finished Concrete. The new concrete shall be hand manipulated and struck off slightly above the final grade. It shall then be mechanically consolidated and screeded to a final grade.

A mechanical or hand trowel finish shall be provided to produce a tight and uniform surface.

As soon as finishing has been completed, all vertical joints with adjacent concrete shall be sealed by painting with thinned grout.

It is recommended that Rapid Setting Class HP Concrete for Bridge Deck Repairs be continuously moist cured in accordance with Rhode Island Standard Specifications Section 814. The use of curing compounds is not allowed.

Traffic or external loads from heavy equipment such as pavers shall not be allowed on the repaired deck surfaces until the concrete has properly cured and has developed the required strength of 4,000 psi as determined by the compressive strength test, or until the Engineer authorized its opening to traffic.

METHOD OF MEASUREMENT. “Rapid Setting Concrete Bridge Deck Repairs (Full Depth Removal)” will be measured by the number square feet of such repairs actually made in accordance with the Plans and/or as directed by the Engineer.

818.05 BASIS OF PAYMENT. The accepted quantity of “Rapid Setting Concrete Bridge Deck Repairs (Full Depth Removal)” will be paid for at the respective contract unit price per square foot as listed in the Proposal. The prices so-stated constitute full and complete compensation for all labor, tools, materials and equipment, and all other incidentals required to finish the work, complete and accepted by the Engineer. Supplemental reinforcing bars shall be paid for separately under the respective items of **Section 810.** of the Specifications.

Distribution of Quantities

Project Name - Bridge Nos. 483-486 Pier Cap Replacement and Miscellaneous Bridge Repairs

Estimate Name - Addendum 2

R.I. Contract No. - 2015-CB-028

FAP Nos: BHO-0483(001)

Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
024	808.0601 Cont.	BRIDGE NO. 484 SB				
		PIER 1		24.00	0014	01
		PIER 2		24.00	0014	01
		BRIDGE NO. 485 NB				
		PIER 3		19.00	0014	01
		PIER 4		19.00	0014	01
		BRIDGE NO. 485 SB				
		PIER 1		20.00	0014	01
		PIER 2		20.00	0014	01
		BRIDGE NO. 486 NB				
		PIER 3		22.00	0014	01
		PIER 4		22.00	0014	01
		BRIDGE NO. 486 SB				
		PIER 1		19.00	0014	01
		PIER 2		19.00	0014	01
Item 808.0601 Total:				349.00		
025	808.1642	PREFORMED POLYETHYLENE FOAM JOINT	SF			
		FILLER 1''				
		BRIDGE NO. 483				
		ABUTMENT 1		6.00	0014	01
		ABUTMENT 2		6.00	0014	01
		BRIDGE NO. 484 NB				
		ABUTMENT 1		5.00	0014	01
		ABUTMENT 2		5.00	0014	01
		BRIDGE NO. 484 SB				
		ABUTMENT 1		5.00	0014	01
		ABUTMENT 2		5.00	0014	01
		BRIDGE NO. 485 NB				
		ABUTMENT 1		4.00	0014	01
		ABUTMENT 2		4.00	0014	01
		BRIDGE NO. 485 SB				
		ABUTMENT 1		4.00	0014	01

Distribution of Quantities

Project Name - Bridge Nos. 483-486 Pier Cap Replacement and Miscellaneous Bridge Repairs

Estimate Name - Addendum 2

R.I. Contract No. - 2015-CB-028

FAP Nos: BHO-0483(001)

Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
025	808.1642 Cont.	ABUTMENT 2		4.00	0014	01
		BRIDGE NO. 486 NB				
		ABUTMENT 1		5.00	0014	01
		ABUTMENT 2		5.00	0014	01
		BRIDGE NO. 486 SB				
		ABUTMENT 1		4.00	0014	01
		ABUTMENT 2		4.00	0014	01
Item 808.1642 Total:				66.00		
026	808.1675	POLYURETHANE ELASTOMERIC JOINT	CI			
		SEALANT				
		BRIDGE NO. 483				
		ABUTMENT 1		403.00	0014	01
		ABUTMENT 2		403.00	0014	01
		BRIDGE NO. 484 NB				
		ABUTMENT 1		317.00	0014	01
		ABUTMENT 2		317.00	0014	01
		BRIDGE NO. 484 SB				
		ABUTMENT 1		317.00	0014	01
		ABUTMENT 2		317.00	0014	01
		BRIDGE NO. 485 NB				
		ABUTMENT 1		266.00	0014	01
		ABUTMENT 2		266.00	0014	01
		BRIDGE NO. 485 SB				
		ABUTMENT 1		266.00	0014	01
		ABUTMENT 2		266.00	0014	01
		BRIDGE NO. 486 NB				
		ABUTMENT 1		306.00	0014	01
		ABUTMENT 2		306.00	0014	01
		BRIDGE NO. 486 SB				
		ABUTMENT 1		237.00	0014	01
		ABUTMENT 2		237.00	0014	01
Item 808.1675 Total:				4,224.00		

Distribution of Quantities

Project Name - Bridge Nos. 483-486 Pier Cap Replacement and Miscellaneous Bridge Repairs

Estimate Name - Addendum 2

R.I. Contract No. - 2015-CB-028

FAP Nos: BHO-0483(001)

Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
034	817.9901 Cont.	Item 817.9901 Total:		1.00		
035	817.9902	FIBER WRAP EXISTING CONCRETE	LS			
		485)				
		COLUMNS AND PIER CAPS (BRIDGE NO.				
		BRIDGE NO. 485				
		BRIDGE 485		1.00	0014	01
		Item 817.9902 Total:		1.00		
036	817.9903	FIBER WRAP EXISTING CONCRETE	LS			
		COLUMNS AND PIER CAPS (BRIDGE NO.				
		484)				
		BRIDGE NO. 484				
		BRIDGE NO. 484		1.00	0014	01
		Item 817.9903 Total:		1.00		
037	817.9904	FIBER WRAP EXISTING CONCRETE	LS			
		COLUMNS AND PIER CAPS (BRIDGE NO.				
		486)				
		BRIDGE NO. 486				
		BRIDGE NO. 486		1.00	0014	01
		Item 817.9904 Total:		1.00		
038	818.9901	RAPID SETTING CONCRETE BRIDGE DECK	SF			
		REPAIR (FULL DEPTH REMOVAL)				
		BRIDGE NO. 483				
		JOINT OVER PIER 1		135.00	0014	01
		JOINT OVER PIER 2		135.00	0014	01
		JOINT OVER PIER 3		135.00	0014	01
		BRIDGE NO. 485 NB				
		JOIN OVER PIER 4		90.00	0014	01
		JOINT OVER PIER 3		90.00	0014	01
		BRIDGE NO. 485 SB				

Distribution of Quantities

Project Name - Bridge Nos. 483-486 Pier Cap Replacement and Miscellaneous Bridge
Repairs

Estimate Name - Addendum 2

R.I. Contract No. - 2015-CB-028

FAP Nos: BHO-0483(001)

Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
038	818.9901 Cont.	JOINT OVER PIER 1		90.00	0014	01
		JOINT OVER PIER 2		90.00	0014	01
Item 818.9901 Total:				765.00		