



**STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION**



**2800 BERLIN TURNPIKE, P.O. BOX 317546
NEWINGTON, CONNECTICUT 06131-7546**

Phone: 860-594-3128

November 15, 2016

Subject: Project No. 35-194: Rehabilitation of Bridge No.00047 Old King's Highway North over I-95 in the Town of Darien

NOTICE TO CONTRACTORS:

This is to notify all concerned and especially the prospective bidders that the bid opening for the subject project is still scheduled for November 16, 2016, at 2:00 P.M. in the Conference Room of the Department of Transportation Administration Building, 2800 Berlin Turnpike, Newington, Connecticut.

Addendum No. 1 is attached

Please send all future questions to <http://dot-contractsqanda.ct.gov/Default.aspx>

Philip J. Melchionne

For: Gregory D. Straka
Contracts Manager
Division of Contracts Administration

NOVEMBER 15, 2016
REHABILITATION OF BRIDGE NO. 00047
OLD KING'S HIGHWAY NORTH OVER I-95
FEDERAL AID PROJECT NO. N/A
STATE PROJECT NO. 0035-0194
TOWN OF DARIEN

ADDENDUM NO. 1

This Addendum addresses the following questions and answers contained on the “CT DOT QUESTIONS AND ANSWERS WEBSITE FOR ADVERTISED CONSTRUCTION PROJECTS”:

Question and Answer Nos. 3 and 6

SPECIAL PROVISIONS
REVISED SPECIAL PROVISIONS

The following Special Provisions are hereby deleted in their entirety and replaced with the attached like-named Special Provisions:

- ITEM NO. 0514271A – PRECAST CONCRETE STEEL COMPOSITE SUPERSTRUCTURE
- ITEM NO. 0520036A – ASPHALTIC PLUG EXPANSION JOINT SYSTEM

CONTRACT ITEMS
REVISED CONTRACT ITEMS

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ORIGINAL QUANTITY</u>	<u>REVISED QUANTITY</u>
0514271A	PRECAST CONCRETE STEEL COMPOSITE SUPERSTRUCTURE	4961 SF	4547 SF
0714050A	TEMPORARY EARTH RETAINING SYSTEM	3850 SF	450 SF

The Detailed Estimate Sheet does not reflect these changes.

The Bid Proposal Form has been revised to reflect these changes.

There will be no change in the number of calendar days due to this Addendum.

The foregoing is hereby made a part of the contract.

ITEM #0514271A – PRECAST CONCRETE/STEEL COMPOSITE SUPERSTRUCTURE

Description: Work under this item shall be in accordance with the applicable provisions of Sections 5.08, 6.01, 6.02 and 6.03, and the provisions contained herein.

This Item shall include the fabrication, delivery, temporary bracing, and installation of the Prefabricated Bridge Units (PBUs), including all necessary materials, labor and equipment to complete the work, as shown on the plans. The PBUs are comprised of steel beams made composite with a reinforced concrete deck, cast prior to the erection of the PBU. Cast-in-place concrete closure pours and link slabs will be used to connect the deck portions of the PBUs.

This item also includes appurtenances that are incidental to the PBU or projecting from the PBU including, but not limited to, diaphragms, sole plates, and projecting reinforcing steel.

Due to the accelerated nature of this project, all PBUs shall be manufactured and accepted two weeks prior to the initiation of the full roadway closure at the site.

Materials: The materials for Prefabricated Bridge Units shall conform to the following requirements:

Structural steel materials shall conform to the requirements of Section M.06. Shear stud connectors shall conform to the requirements of Subarticle M.06.02-12. All structural steel in the superstructure shall conform to the requirements of AASHTO M270, Grade 50W T2. This includes the steel girders, connection plates, sole plates, and diaphragms.

Class “F” Concrete shall be used for the bridge deck and closure pours. Concrete shall meet the requirements of Article M.03.01, for Class “F” Concrete” and shall have a minimum 28-day compressive strength of 4,400 psi. The use of calcium chloride or an admixture containing calcium chloride will not be permitted.

Bridge Deck Concrete shall be used for link slab area of the superstructure.

Reinforcing steel shall be epoxy coated deformed steel bars and conform to the requirements of Article M.06.01.

Construction Methods: Off-site fabrication of the concrete deck shall be performed by a Fabricator with an established Quality Control Management plan which is acceptable to the Engineer.

- 1. Shop Drawings:** Prior to any fabrication, the Contractor shall submit shop drawings in accordance with Article 1.05.02-3. Multiple shop drawings may be required for the PBUs since the fabrication can take place in two separate facilities. The Contractor shall coordinate the preparation of the separate shop drawings to ensure that there are no conflicting details.

ITEM #0514271A

Approval of the shop drawings will be required prior to the ordering of the materials and the fabrication of the prefabricated bridge units.

In addition to the standard detailing of shop drawings, the Contractor shall include the following information:

- a. The stamp of the registered Professional Engineer licensed in the State of Connecticut who has reviewed and certified the shop drawings.
 - b. All lifting inserts, hardware, or devices and locations for Engineer's approval. All lifting devices shall be designed by the Contractor.
 - c. Locations and details of the lifting devices, including supporting calculations, type, and amount of any additional reinforcing required for lifting. All lifting devices will be designed based on the no cracking criteria in Chapter 8 of the PCI Design Handbook (Seventh Edition).
 - d. Details and methods for accommodating the dimensional requirement of each PBU accounting for profile grade and cross slope.
 - e. Methods for controlling the accumulation of dimensional tolerances through the use of working points or working lines. The width of each individual unit along with the width of the closure pour shall be determined such that, when pieces are laid together, the prefabricated bridge units shall satisfy the required bridge out-to-out width and cross slopes shown on the plans.
 - f. The minimum required compressive strength of the concrete deck prior to handling the prefabricated bridge units.
- 2. Assembly Plan:** The Assembly Plan is a document prepared by the Contractor and a qualified Professional Engineer with specific knowledge of the Contractor's equipment and "means and methods" for constructing the elements required to complete the work on the project. The development of this Assembly Plan is closely linked to the schedule of operations and the interim material strengths necessary for the work to progress. The Contractor shall coordinate the development of the Assembly Plans with the development of the Shop Drawings to ensure consistent detailing. For example, if additional lifting hooks, grout ports, leveling devices, etc. are required, they should be added to the shop drawings prior to approval.

The development of the Assembly Plan and Shop Drawings for the PBUs will not be measured separately for payment and should be considered incidental to this Item.

The Assembly Plan shall be considered a Working Drawing. The development and approval of the Assembly Plan shall be according to Article 1.05.02. Approval of the Assembly Plan will be required prior to the initiation of the full roadway closure.

Under no circumstances shall the fabrication of the prefabricated bridge units commence prior to the approval of the Shop Drawings and the Assembly Plan unless written permission is given by the Engineer. The Department shall reject any components fabricated before

receiving written approval or components that deviate from the approved drawings. Any expenses incidental to the revision of materials furnished, in accordance with the Shop Drawings and order lists, to make them comply with the plans and specifications, including costs incurred due to faulty detailing or fabrication, shall be borne by the Contractor.

At a minimum, the Assembly Plan shall include the following information:

- a) Details and/or cut sheets of all equipment that will be employed for the assembly of the prefabricated bridge units.
- b) Details of all equipment to be used to lift the PBUs including cranes, excavators, lifting slings, sling hooks, and jacks. Crane locations, operation radii, and lifting calculations will also be included. The factors of safety for the lifting of PBUs will be achieved by using 125% of the weight of the PBU being lifted. The Contractor is responsible for determining the center of gravity for all PBUs. Special care shall be used for PBUs that are not symmetrical. These elements may require special lifting hardware to allow for installation to the grades shown on the plans.
- c) The Assembly plan shall address the potential for tension in the concrete deck during shipping and handling. Allowable tension stresses in the concrete shall be according Chapter 8 of the PCI Design Handbook (seventh edition). Calculations shall be prepared for the lifting and handling in accordance with the no discernible cracking criteria. Lifting hook locations and hardware shall be coordinated with the Fabricator(s).
- d) A statement of compliance with all requirements of applicable environmental permits.
- e) A work area plan, depicting all affected utilities, drainage, and protective measures that will be employed throughout the construction activities.
- f) Full size 22"x34" sheets depicting the assembly procedures for the PBUs.
- g) A detailed schedule with the timeline for all operations. In development of the schedule the Contractor shall account for setting and cure times for concrete closure pours.
- h) Methods of adjusting and securing the elements after placement.
- i) Procedures for controlling erection tolerances for both the horizontal and vertical direction.
- j) Methods of forming closure pours.
- k) Methods for curing closure pours. The Contractor shall include detailed description of curing materials if casting is anticipated during times when wet weather can be anticipated.
- l) The Assembly Plan shall be bound into one complete document and shall be prepared and stamped by a registered Professional Engineer licensed in the State of Connecticut.

- 3. Installation:** The field personnel shall have knowledge of and follow the approved Assembly Plan. If changes are warranted due to varying site conditions, resubmit the plan for review
ITEM #0514271A

and approval.

Working points, working lines, and benchmark elevations shall be established prior to placement of all elements. The Contractor is responsible for field survey as necessary to complete the work. The District reserves the right to perform additional independent survey. This survey does not relieve the Contractor from performing survey for the construction. If discrepancies are found, the Contractor may be required to verify previous survey data.

The PBUs shall be placed in the sequence and according to the methods outlined in the Assembly Plan. The height of each element will be adjusted to acceptable tolerances by means of leveling devices or shims. The Contractor shall ensure that the PBU is in the proper horizontal and vertical location prior to releasing from the crane and setting the next unit. Vertical tolerance needs to be checked at the top surface of the PBU. Diaphragms may be used to control geometry; however if the required setting tolerance cannot be met, the Contractor may be required to adjust or fabricate new diaphragms.

4. Erection Tolerances:

a) Plan Alignment: Location and Clearances

The Contractor shall adhere to the following tolerances for the final condition of the PBU after placement:

- i. Do not exceed 1/4 inch maximum deviation at each end of the span from overall longitudinal alignment after setting.
- ii. Do not exceed 1/4 inch maximum deviation from overall transverse location (i.e. longitudinal position) at each line of bearings.
- iii. Maximum deviation from alignment in both primary plan directions at each end of the span being set shall not exceed 1/4 inch or that required for the accommodation of manufactured expansion joint components or bearings, whichever is the less.
- iv. In the absence of other constraints, keep individual elements or surfaces within 1/4 inch of location with respect to similar matching surfaces.

b) Bridge Bearings: Elevation and Location

The Contractor shall keep the elevation of individual bridge bearings within plus or minus 1/8 inch of required elevations. The plan location of bridge bearings shall be within a tolerance of 1/8 inch and the alignment within plus or minus 1/16 inch across the bearing.

If tolerances are not met, submit for approval of Engineer, means to adjust elevations or to correct for or accommodate errors or unintended deviations from required tolerances. Submit proposals and seek approval of the Engineer for the use of shims, injection of high strength grout or other methods to accommodate differences from required tolerance. Do likewise, for the accommodation of anchor bolts or similar restraining devices.

ITEM #0514271A

5. Quality Control: At a minimum, the following requirements shall be met:

- a) The reinforced concrete deck on top of the girder pairs shall be constructed by a concrete fabricator with an established Quality Control Management plan that is approved by the Department. The fabricator shall follow the Department's approved quality control procedures.
- b) The PBUs will be constructed to tolerances shown on the plans. Where tolerances for the concrete deck are not shown, follow tolerance limits in the PCI MNL 116-99, "Manual for Quality Control for Plants and Production of Structural Precast Concrete Products, 4th Edition". Elements that are found to be out of tolerance may be subject to rejection. Rejection of the elements may be waived by the Engineer if the Contractor can demonstrate that the out of tolerance element can be installed without significant modifications to the bridge. For example, an over width element may be acceptable if the adjacent element is under width.
- c) The Contractor is required to provide field survey to determine that the PBUs are placed within the horizontal and vertical tolerances stated on the plans.
- d) The Contractor is responsible for interim testing of concrete placed in the field to allow the work to proceed with various stages of construction. For example, if the approved Assembly Plan allows for loads to be placed on the PBU after the closure pour concrete has achieved a compressive strength of 2000 psi, the Contractor will be required to test the concrete proving that the strength has been achieved. For materials used throughout the construction that have a proven strength gain at predetermined time interval, the compressive testing requirements may be waived by the Engineer. All testing furnished by the Contractor shall be performed by an AASHTO accredited laboratory. All Quality Control test results shall be submitted to the Division of Materials Testing section for approval. Additional testing by the Contractor will be performed at no additional cost and will not be measured for payment. Final acceptance testing of concrete shall be in accordance with Article 6.01.03.
- e) The fabricator and Contractor shall prevent cracking or damage of the PBUs during handling, storage, transportation, and final installation in permanent position.
- f) If damage occurs, replace defects and breakage of the PBUs in accordance with the following:
 - i. Members that sustain damage or surface defects during fabrication, handling, storage, hauling, or erection are subject to review or rejection.
 - ii. Approval must be obtained before performing repairs.
 - iii. Repair work must re-establish the elements' structural integrity, durability, and aesthetics to the satisfaction of the Engineer.
 - iv. Determine the cause when damage occurs and take corrective action.
 - v. Failure to take corrective action, leading to similar repetitive damage, can be

ITEM #0514271A

cause for rejection of the damaged element.

- vi. Cracks that extend to the nearest reinforcement plane and fine surface cracks that do not extend to the nearest reinforcement plane but are numerous or extensive are subject to review and rejection.
- g) The plant will document all test results. The quality control file will contain at least the following information:
 - i. Element identification
 - ii. Date and time of casting
 - iii. Concrete cylinder test results
 - iv. Quantity of used concrete and the batch printout
 - v. Form-stripping date and repairs if applicable
 - vi. Location/number of blockouts and lifting inserts
 - vii. Temperature and moisture of curing period
 - viii. Document lifting device details, requirements, and inserts

6. Marking: Permanently mark each prefabricated bridge unit with the date of casting and supplier identification. Stamp markings in fresh concrete.

7. Handling and Storage: Materials for this work shall be stored off the ground before, during, and after fabrication. The PBUs shall be kept free from dirt, grease and other contaminants and shall be reasonably protected from corrosion. Care shall be taken during storage, transporting, hoisting and handling of the PBUs to prevent damage to any part of the PBU. Sections damaged by improper storing, transporting or handling shall be repaired or replaced by the Contractor, as directed by the Engineer and at no cost to the State. All storage and handling operations shall be as directed by the Engineer.

8. Special Considerations: The total number of PBUs, required to make up the full bridge width, must be fabricated together on temporary supports in the same orientation as they will end up in their final location supported by the bridge substructure.

Method of Measurement: This work will be measured for payment by the actual area of concrete deck cast, finished, cured and accepted prior to erection of the PBU. Measurements will be made across the top (horizontal) surface of the concrete deck prior to erection. There will be no measurement for payment of any vertical face along the PBU nor any closure pour/link slab areas. Reinforcing bar extensions shall not be used for these measurements.

Basis of Payment: This work will be paid for at the contract unit price per square foot for "Precast Concrete/Steel Composite Superstructure", complete and accepted. Price shall include all tools, material, equipment, labor and work incidental to the construction.

Payment for work and materials described above or as noted on the plans as being incidental to the construction of the PBU shall be included in the unit price for "Precast Concrete/Steel

Composite Superstructure”.

Concrete for the closure pours shall be paid for separately under the item “Class “F” Concrete”.
Concrete for the link slab shall be paid for separately under the item “Bridge Deck Concrete”.

<u>Pay Item</u>	<u>Pay Unit</u>
Precast Concrete/Steel Composite Superstructure	S.F.

ITEM #0520036A - ASPHALTIC PLUG EXPANSION JOINT SYSTEM

Description: Work under this item shall consist of furnishing and installing an asphaltic plug expansion joint system (APJ) in conformance with ASTM D6297, as shown on the plans, and as specified herein.

Work under this item shall also consist of the removal and disposal of bituminous concrete, membrane waterproofing, existing joint components and sealing elements, cleaning and sealing median barrier joints, parapet joints, and sidewalk joints.

Work under this item excludes the removal of Portland cement concrete headers.

Materials: The APJ component materials shall conform to ASTM D6297 and the following:

Aggregate: The aggregate shall meet the following requirements:

- a) Loss on abrasion: The material shall show a loss on abrasion of not more than 25% using AASHTO Method T96.
- b) Soundness: The material shall not have a loss of more than 10% at the end of five cycles when tested with a magnesium sulfate solution for soundness using AASHTO Method T 104.
- c) Gradation: The aggregate shall meet the requirements of Table A below:
- d) Dust: aggregate shall not exceed 0.5% of dust passing the #200 sieve when tested in accordance with AASHTO T-11.

Table A

<u>Square Mesh Sieves</u>	1" (25.0 mm)	¾" (19.0 mm)	½" (12.5 mm)	⅜" (9.5 mm)	No. 4 (4.75 mm)
% passing	100	90 - 100	20 - 55	0 - 15	0 - 5

A sample of the aggregate shall be submitted to the Department with a Certified Test Report in accordance with Article 1.06.07 for each 20 tons of loose material or its equivalent number of bags delivered to the job site. The Certified Test report must include a gradation analysis resulting from a physical test performed on the actual material that accompanies the report.

Anti-Tacking Material: This material shall be a fine graded granular material with 100% passing the ¾" sieve and no more than 5% passing the #200 when tested in accordance with AASHTO T-27.

Backer Rod: All backer rods shall satisfy the requirements of ASTM D5249, Type 1.

Bridging Plate: The bridging plates shall be steel conforming to the requirements of ASTM A36 and be a minimum ¼" thick and 8" wide. For joint openings in excess of 3" the minimum plate dimensions shall be ⅜" thick by 12" wide. Individual sections of plate shall

ITEM #0520036A

not exceed 4' in length. Steel locating pins for securing the plates shall be size 16d minimum, hot-dip galvanized, and spaced no more than 12" apart.

Concrete Leveling Material: Shall be a cementitious-based material that conforms to ASTM C928 Standard Specification for Packaged, Dry, Rapid-Hardening Cementitious Materials for Concrete Repair, for R3 performance requirements in Table 1 and achieve the following:

- a. Final set in 45 Minutes
- b. 2500 psi compressive strength in 24 hours
- c. 5000 psi compressive strength in 7 days

Parapet Sealant: The sealant used in parapet joint openings shall be a single component non-sag silicone sealant that conforms to the requirements of ASTM D5893.

Sidewalk Sealant: The sealant used in sidewalk joint openings shall be a rapid cure, self-leveling, cold applied, two-component silicone sealant. The silicone sealant shall conform to the requirements listed in Table B:

Table B

Properties - As Supplied	Test Method	Requirement
Extrusion Rate	ASTM C1183	200-600 grams/min
Leveling	ASTM C639	Self-Leveling
Specific Gravity	ASTM D792	1.20 to 1.40
Properties - Mixed	Test Method	Requirement
Tack Free Time	ASTM C679	60 min. max.
Joint Elongation – Adhesion to concrete	ASTM D5329 ^{1,2,3}	600% min
Joint Modulus @ 100% elongation	ASTM D5329 ^{1,2,3}	15 psi max
Cure Evaluation	ASTM D5893	Pass @ 5 hours

1. Specimens cured at $77 \pm 3^{\circ}\text{F}$ and $50 \pm 5\%$ relative humidity for 7 days
2. Specimens size: $\frac{1}{2}$ " wide by $\frac{1}{2}$ " thick by 2" long
3. Tensile Adhesion test only

The date of manufacture shall be provided with each lot. No sealant shall be used beyond its maximum shelf-life date.

The two-part silicone sealants shown in Table C are known to have met the specified requirements:

Table C

Product	Supplier
Dow Corning 902RCS	Dow Corning Corporation 2200 W Salzburg Road Auburn, Michigan 48611
Wabo SiliconeSeal	BASF/Watson Bowman Acme Corporation 95 Pineview Drive Amherst, New York 14228

Other two-component silicone joint sealants expressly manufactured for use with concrete that conform to the aforementioned ASTM requirements will be considered for use provided they are submitted in advance for approval to the Engineer. Other joint sealants will be considered for use only if a complete product description is submitted, as well as documentation describing at least five installations of the product. These documented installations must demonstrate that the product has performed successfully for at least three years on similar bridge expansion joint applications.

A Materials Certificate and Certified Test Report for the asphaltic binder shall be submitted by the Contractor in accordance with the requirements of Article 1.06.07 certifying that the asphaltic binder satisfies the requirements of the most current version of ASTM D6297.

A Materials Certificate for all other components of the APJ, leveling material, backer rod and sealant used in sealing parapet and sidewalk joint openings, shall be submitted by the Contractor in accordance with the requirements of Article 1.06.07

Construction Methods: The APJ shall be installed at the locations shown on the plans and in stages in accordance with the traffic requirements in the special provisions “Maintenance and Protection of Traffic” and “Prosecution and Progress”.

At least 30 days prior to start of the work, the Contractor shall submit to the Engineer for approval a detailed Quality Control Plan for the installation of the APJ. The submittal shall include:

- a) A list of all manufactured materials and their properties to be incorporated in the joint system, including, but not limited to the asphaltic binder, anti-tack material, backer rod, sealant, leveling material, as well as the aggregate’s source.
- b) A detailed step by step installation procedure and a list of the specific equipment to be used for the installation. The Quality Control Plan must fully comply with the specifications and address all anticipated field conditions, including periods of inclement weather.

The APJ shall not be installed when bituminous concrete overlay or joint cutout is wet. The APJ shall only be installed when the bridge superstructure surface temperature is within the limits specified in Table D and when the ambient air temperature is within the range of 45⁰F to 95⁰F.

ITEM #0520036A

The bridge superstructure surface temperature range is determined using the thermal movement range provided on the contract plans for the proposed APJ deck installation location and the selected APJ product.

Table D

Installation Restrictions	
Designed Deck Joint Thermal Movement Range²	Bridge Superstructure Surface Temperature¹
0" to 1"	45° F to 95° F
1-1/8"	45° F to 90° F
1-1/4"	45° F to 80° F
1-3/8"	45° F to 70° F
1-1/2"	45° F to 65° F

1. The superstructure surface temperature shall be determined from the average of three or more surface temperature readings taken at different locations on the interior girder surfaces by the Contractor as directed by the Engineer. Temperature measurements of the superstructure shall be taken by the contractor with a calibrated hand held digital infrared laser-sighted thermometer on the surfaces of an interior steel girder, or interior concrete girder protected from direct sunlight. The infrared thermometer to be supplied by the Contractor for this purpose shall meet certification requirements of EN61326-1, EN61010-1, and EN60825-1 maintained by the European Committee for Electrotechnical Standardization (CENELEC). The thermometer shall have a minimum distance-to-spot ratio of 50:1 and shall have adjustable emissivity control. The thermometer shall have a minimum accuracy value of $\pm 1\%$ of reading or $\pm 2^\circ\text{F}$, whichever is greater. The thermometer shall be used in strict accordance with the manufacturer's written directions. An additional infrared thermometer satisfying the same standards to be used in this application shall also be provided to the Engineer for quality assurance purposes.
2. Linear interpolation may be used to determine an allowable surface temperature range for thermal movement ranges in between values shown in the table, as approved by the Engineer.

Prior to installing the APJ, the Contractor shall determine the exact location of the deck joint beneath the bituminous concrete overly.

The APJ shall be installed symmetrically about the deck joint opening to the dimensions shown on the plans or as directed by the Engineer; not to exceed 24 inches measured perpendicular to the deck joint. The proposed saw cut lines shall be marked on the bituminous concrete overlay by the Contractor and approved by the Engineer, prior to saw-cutting. The saw-cuts delineating the edges of the APJ shall extend full depth of the bituminous concrete overlay.

The existing bituminous concrete overlay, waterproofing membrane and/or existing expansion joint material, within the saw cut limits shall be removed and disposed of by the Contractor to create the joint cutout.

Concrete surfaces that will support the bridging plates shall be smooth and form a plane along and across the deck joint. Rough or damaged concrete surfaces shall be repaired with a leveling compound meeting the requirements of this specification. Deteriorated concrete areas within the joint limits shall be repaired as directed by the Engineer: such repairs, when deemed necessary by the Engineer, shall be compensated for under the applicable concrete deck repair items in the Contract. The existing and repaired concrete surfaces shall provide continuous uniform support for the bridging plate and prevent the plate from rocking and deflecting.

Prior to the installation of the backer rod, all horizontal and vertical surfaces of the joint cutout shall be abrasive blast cleaned using an oil-free, compressed air supply. The entire cutout shall then be cleared of all loose blast media, dust, debris and moisture using an oil-free, hot air lance capable of producing an air stream at 3,000°F with a velocity of 3,000 feet per second.

A single backer rod, with a diameter at least 25% greater than the existing joint opening at the time of installation, shall be installed at an inch below the bridging plate in the existing deck joint opening between the concrete edges.

Asphaltic binder shall be heated to a temperature within the manufacturer's recommended application temperature range which shall be provided in the Quality Control Plan. During application, the temperature of the binder shall be maintained within this range. In no case shall the temperature of the binder go below 350° F nor exceed the manufacturer's recommended maximum heating temperature.

Asphaltic binder shall then be poured into the joint opening until it completely fills the gap above the backer rod. A thin layer of binder shall next be applied to the all horizontal and vertical surfaces of the joint cutout.

Bridging plates shall be abrasive blast-cleaned on-site prior to installation and then placed over the deck joint opening in the joint cutout. The plates shall be centered over the joint opening and secured with locating pins along its centerline. The plates shall be placed end to end, without overlap, such that the gap between plates does not exceed ¼". The plates shall extend to the gutter line and be cut to match the joint's skew angle, where concrete support exists on both sides of the joint. Within APJ installation limits, where concrete support does not exist at both sides of the joint opening (such as where a bridge deck end abuts a bituminous concrete roadway shoulder), bridging plates shall not be installed. Installed bridging plates shall not rock or deflect

ITEM #0520036A

in any way. After installation of bridging plates, a thin layer of asphaltic binder shall be applied to all exposed surfaces of the plates.

The remainder of the joint cutout shall then be filled with a mixture of hot asphaltic binder and aggregate prepared in accordance with the submitted Quality Control Plan and the following requirements:

- The aggregate shall be heated in a vented, rotating drum mixer by the use of a hot-compressed air lance to a temperature of between 370° F. to 380° F. This drum mixer shall be dedicated solely for the heating and, if necessary, supplemental cleaning of the aggregate. Venting of the gas and loose dust particles shall be accomplished through ¼” drilled holes spaced no more than 3” on center in any direction along the entire outside surface of the drum
- Once the aggregate has been heated, it shall then be transferred to a secondary drum mixer where it shall be fully coated with asphaltic binder. A minimum of two gallons of binder per 100lbs of stone is required.
- The temperature of the aggregate and binder shall be monitored by the contractor with a calibrated digital infrared thermometer.
- The coated aggregate shall be loosely placed in the joint cutout in lifts not to exceed 2 inches.
- Each lift shall be leveled, compacted and then flooded with hot asphaltic binder to the level of the aggregate to fill all voids in the coated aggregate layer. The surface of each lift shall be flooded until only the tips of the aggregate protrude out of the surface.
- The final lift shall be placed such that no stones shall project above the level of the adjacent overlay surface following compaction of the coated aggregate.
- Following installation of the final lift, sufficient time and material shall be provided to allow all voids in the mixture to fill. This step may be repeated as needed.
- The joint shall then be top-dressed by heating the entire area with a hot-compressed air lance and applying binder. The final joint surface must be smooth with no protruding stones and be absent of voids.
- Once top-dressed, the joint shall have an anti-tack material spread evenly over the entire surface to prevent tracking.

The Contractor shall be responsible for removing all binder material that leaks through the joint and is deposited on any bridge component, including underside of decks, headers, beams, diaphragms, bearings, abutments and piers.

Traffic shall not be permitted over the joint until it has cooled to 130° F when measured with a digital infrared thermometer. Use of water to cool the completed joint is permitted.

Sidewalk, parapet, and/or curb joint openings

Before placement of any sealing materials in parapets, curbs, or sidewalks, the joints shall be thoroughly cleaned of all scale, loose concrete, dirt, dust, or other foreign matter by abrasive blast cleaning. Residual dust and moisture shall then be removed by blasting with oil free

compressed air using a hot air lance. Projections of concrete into the joint space shall also be removed. The backer rod shall be installed in the joint as shown on the plans. The joint shall be clean and dry before the joint sealant is applied. Under no circumstances is the binder material to be used as a substitute for the joint sealant.

Whenever abrasive blast cleaning is performed under this specification, the Contractor shall take adequate measures to ensure that the abrasive blast cleaning will not cause damage to adjacent traffic or other facilities.

The joint sealant shall be prepared and placed in accordance with the manufacturer's instructions and with the equipment prescribed by the manufacturer. Extreme care shall be taken to ensure that the sealant is placed in accordance with the manufacturer's recommended thickness requirements.

The joint sealant shall be tooled, if required, in accordance with the manufacturer's instructions.

Primer, if required, shall be supplied by the sealant manufacturer and applied in accordance with the manufacturer's instructions.

When the sealing operations are completed, the joints shall be effectively sealed against infiltration of water. Any sealant which does not effectively seal against water shall be removed and replaced at the Contractor's expense.

Any installed joint that exhibits evidence of failure, as determined by the Engineer, such as debonding, cracking, rutting, or shoving of the APJ mixture shall be removed and replaced full-width and full-depth to a length determined by the Engineer at no additional cost to the State.

Method of Measurement: This work will be measured for payment by the number of cubic feet of "Asphaltic Plug Expansion Joint System" installed and accepted within approved horizontal limits. No additional measurement will be made for furnishing and installing backer rod and joint sealant in the parapets, concrete medians, curbs and/or sidewalks.

Basis of Payment: This work will be paid for at the contract unit price per cubic foot for "Asphaltic Plug Expansion Joint System," complete in place, which price shall include the saw-cutting, removal and disposal of bituminous concrete, membrane waterproofing, existing joint components and sealing elements, the furnishing and placement of the leveling compound, cleaning of the joint surfaces, furnishing and installing bridging plates, the furnishing and installing of the asphaltic plug joint mixture, the cost of furnishing and installing joint sealant in the parapets, concrete medians, curbs and sidewalks, and all other materials, equipment including, but not limited to, portable lighting, tools, and labor incidental thereto. No additional payment shall be made for the 12" wide bridging plates that are required for deck joint openings with widths in excess of 3".

If directed by the Engineer, additional deck repairs will be addressed and paid for under the applicable concrete deck repair items in the Contract.