SPECIAL PROVISION

SPECIFICATION 939 - BRIDGE JOINT SYSTEM REPAIR

939-1 DESCRIPTION

939-1.01 Scope – This work shall consist of the partial or full repair of bridge joint system in accordance with these specifications and in conformity with the lines, grades, details and notes shown on the plans or established by the Engineer.

Each word, sentence, section or article of this document is independent. Not applying parts of it does not imply that it cannot be enforced afterwards nor invalidates the remaining provisions.

939-2 MATERIALS

939-2.01 Materials shall conform to the applicable specifications of the Standard Specifications for Road and Bridge Construction. Materials shall be as specified or as shown on the details and notes in the plans.

939-2.02 Header Material – The Header Material shall be of two types (Polymer Concrete, and Elastomeric Concrete) as follows:

a. Polymer Concrete – The Polymer Concrete shall be a high strength, non-shrink material conforming to the following requirements:

1. The Polymer Concrete shall consist of a liquid resin, powder filler, and coarse aggregates. The mix of Polymer Concrete shall attain a minimum compressive strength of 4,000 psi at 4 hours. The minimum compressive strength shall conform to the requirements of ASTM C 39 and AASHTO T 22. The Polymer Concrete shall resist the typical road chemicals including fuels, oils and others.

2. The Polymer Concrete shall be capable of providing a permanent patch in concrete and gaining the required strength in a manner that allows the roadway to be opened to traffic within two (4) hours of placement while maintining all contract quality and durability requirements.

3. The pot life of the Polymer Concrete shall have a range of 8 to 15 minutes minimum and be consistent over a temperature range of 60º to 90ºF.

4. The coarse aggregates shall conform to the Article 939-2.06 of this specification.

5. The Contractor shall submit the product technical data sheets and Manufacturer's certifications for review and approval by the Engineer. When required by the Engineer, the Contractor shall also submit certified test reports for approval.

6. Material shall be factory packaged in strong moisture proof bags or containers capable of withstanding shipping, handling and storage without breakage. Material shall have a storage life of at least one year. Each container shall be clearly labeled including:

   (a) Manufacturer's name and batch number.

   (b) Component designation, if two or more components.

   (c) Mixing directions and ratios.

   (d) Potential hazards and precautions.

7. Acceptance of the material will be on the basis of certification by the Manufacturer that the material meets these requirements. However, failure by the material to perform adequately in actual use shall be just cause for rejection regardless of certification.

b. Elastomeric Concrete – The Elastomeric Concrete shall be a high strength, self-leveling material conforming to the following requirements:

   1. The Elastomeric Concrete shall consist of a two-component or three-component polyurethane material, and coarse aggregates. The mix of Elastomeric Concrete shall attain a minimum compressive strength of 2,000 psi at 3 hours. The minimum compressive strength shall conform to the requirements of ASTM D 695. The Elastomeric Concrete shall resist the typical road chemicals including fuels, oils and others, and it shall be skid-resistant.

   2. The Elastomeric Concrete shall be capable of providing a permanent patch in concrete and gaining the required strength in a manner that allows the roadway to be opened to traffic within two (2) hours of placement while maintining all contract quality and durability requirements.

   3. The pot life of the Elastomeric Concrete shall have a range of 8 to 15 minutes minimum and be consistent over a temperature range of 60º to

90ºF. The Resilience at 5% deflection shall be 90% (minimum) as per ASTM D 695.

4. The coarse aggregates shall conform to the Article 939-2.06 of this specification.

5. The Contractor shall submit the product technical data sheets and Manufacturer's certifications for review and approval by the Engineer. When required by the Engineer, the Contractor shall also submit certified test reports for approval.

6. Material shall be factory packaged in strong moisture proof bags or containers capable of withstanding shipping, handling and storage without breakage. Material shall have a storage life of at least one year. Each container shall be clearly labeled including:

   (a) Manufacturer's name and batch number.

   (b) Component designation, if two or more components.

   (c) Mixing directions and ratios.

   (d) Potential hazards and precautions.

7. Acceptance of the material will be on the basis of certification by the Manufacturer that the material meets these requirements. However, failure by the material to perform adequately in actual use shall be just cause for rejection regardless of certification.

c. **Intentionally Omitted**

939-2.03 Asphalt Binder Material – The Asphalt Binder Material shall be modified elastomeric binder or polymer modified asphalt binder for bridge joint system repair. The Binder Material shall resist the typical road chemicals including fuels, oils and others. The modified elastomeric binder shall meet or exceed the requirements of ASTM D 3405 and ASTM D 1190. The polymer modified asphalt binder shall meet the requirements of ASTM D 6297 and ASTM D 5167. The Contractor shall submit the product technical data sheets and Manufacturer's certifications for review and approval by the Engineer. When required by the Engineer, the Contractor shall also submit certified test reports for approval.

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939-2.04 Bridge Joint System – The Bridge Joint System shall be of the following types as shown on plans or contract documents: *Concrete Bridge Joint System, Asphaltic Bridge Joint System, Longitudinal Bridge Joint System, Special Concrete Bridge Joint System,* or *Special Asphaltic Bridge Joint System.* The Contractor shall submit the product technical data sheets and Manufacturer's certifications for review and approval by the Engineer. When required by the Engineer, the Contractor shall also submit certified test reports for approval.

a. The *Concrete Bridge Joint System* shall include the Adhesive-Lubricant, Silicone Joint Sealant, Compression Seal and Premolded Joint Filler.

b. The *Asphaltic Bridge Joint System* shall include the Traffic Bearing Plate, Backer Rod, Expansion Gap, Galvanized Pins, Premolded Joint Filler, Adhesive-Lubricant, Structural Bonding Agent, Asphalt Primer and the Asphalt Binder Material.

c. The *Longitudinal Bridge Joint System* shall include the Compression Seal for concrete joint system or Reinforced Elastomeric Pad for asphaltic joint system, Adhesive-Lubricant, Silicone Joint Sealant, and Premolded Joint Filler.

d. The *Special Concrete Bridge Joint System* shall include the Adhesive-Lubricant, Hot Poured Joint Sealant, Compression Seal and Premolded Joint Filler.

e. The *Special Asphaltic Bridge Joint System* shall include the Reinforced Elastomeric Pad, Silicone Joint Sealant, Premolded Joint Filler, Adhesive-Lubricant, Structural Bonding Agent, Asphalt Primer and the Asphalt Binder Material.

939-2.05 Intentionally Omitted

939-2.06 Coarse Aggregate

a. The Coarse Aggregate shall be clean dry gravel and it shall be free from organic material, clay balls dirt or other deleterious substances. The Coarse Aggregate shall meet the requirements specified in Section 703-2 of Standard Specification 703 – "Aggregates", except that the gradings in Table 703-2 do not apply for this specification. In addition, for Header Material that is to serve as the travel way for vehicular traffic, such as concrete pavement slabs, bridge concrete decks and bridge approach slabs, the Coarse Aggregate shall have a minimum polishing value of 48 as determined by ASTM D 3319.

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939-2.07 Structural Bonding Agent – The Structural Bonding Agent shall be an Epoxy type as well as provide anti-corrosion coating for the steel reinforcement. The Contractor shall submit the product technical data sheets and Manufacturer's certifications for review and approval by the Engineer. When required by the Engineer, the Contractor shall also submit certified test reports for approval.

a. The material properties shall meet the requirements specified in the following parameters and specifications:

Minimum Pot Life.....…….…..….....	60 minutes
Minimum Bond Strength at 24 hr. Open Time.....	2,500 psi (ASTM C 882)
Minimum Compressive Strength at 28 days.....	8,000 psi (ASTM C 109)
Minimum Flexural Strength at 28 days……..……	1,000 psi (ASTM C 348)
Minimum Splitting Tensile Strength at 28 days…….	600 psi (ASTM C 496)

b. Acceptance of the material will be on the basis of Manufacturer's certification establishing the material meets the contract requirements. However, failure by the material to perform adequately in actual use shall be just cause for rejection regardless of certification.

c. Material shall be factory packaged in strong moisture proof bags or containers capable of withstanding shipping, handling and storage without breakage. Material shall have a storage life of at least one year.

939-2.08 Structural Crack Healer / Sealer – The Structural Crack Healer / Sealer shall be a low-viscosity epoxy crack healer / sealer and high-strength adhesive for structures exposed to pneumatic tire traffic, water, chlorides, and chemical attacks. The Structural Crack Healer / Sealer shall meet the requirements specified in ASTM C 881 and AASHTO M 235 Specifications. The Contractor shall submit the product technical data sheets and Manufacturer's certifications for review and approval by the Engineer. When required by the Engineer, the Contractor shall also submit certified test reports for approval.

a. The material properties shall meet the requirements specified in the following parameters and specifications:

Maximum Viscosity (low, Grade 1).....	90 cps	(ASTM D 2393)
Minimum Pot Life.....	25 minutes	
Minimum Bond Strength at 2 days in 73°F.....	1,300 psi	(ASTM C 882)
Minimum Compressive Strength at 7 days in 73°F....	10,000 psi	(ASTM D 695)
Minimum Flexural Strength at 7 days in 73°F.....	9,000 psi	(ASTM D 790)
Minimum Tensile Strength at 7 days in 73°F.....	7,000 psi	(ASTM D 638)

b. Acceptance of the material will be on the basis of Manufacturer's certification establishing the material meets the contract requirements. However, failure by the material to perform adequately in actual use shall be just cause for rejection regardless of certification.

c. Material shall be factory packaged in strong moisture proof bags or containers capable of withstanding shipping, handling and storage without breakage. Material shall have a storage life of at least one year.

939-2.09 Corrosion Inhibitor – The Corrosion Inhibitor shall be a low-viscosity combination of amino alcohols, and inorganic inhibitors. It shall protect or reduce the corrosion in reinforced concrete structures exposed to pneumatic tire traffic, water, chlorides, and chemical attacks. The product shall meet the requirements specified in ASTM G 109 Specification with a viscosity less than 25 centipoise (CPS). The Corrosion Inhibitor shall not be slippery when the product dries. The Contractor shall submit the product technical data sheets and Manufacturer's certifications for review and approval by the Engineer. When required by the Engineer, the Contractor shall also submit certified test reports for approval.

a. Acceptance of the material will be on the basis of Manufacturer's certification establishing the material meets the contract requirements. However, failure by the material to perform adequately in actual use shall be just cause for rejection regardless of certification.

b. Material shall be factory packaged in strong moisture proof bags or containers capable of withstanding shipping, handling and storage without breakage. Material shall have a storage life of at least one year.

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939-2.10 Miscellaneous Materials

a. The **Silicone Joint Sealant** shall be one-part silicone formulation and is furnished ready for application. The Silicone Joint Sealant shall meet the requirements specified in Table 705-1 of Standard Specification 705 – "Joint Materials". Acid cure sealants are not acceptable.

b. The **Adhesive-Lubricant** shall meet the requirements specified in ASTM D 4070.

c. The **Compression Seal** shall be preformed neoprene compression seal and shall meet the requirements specified in ASTM D 3542 and AASHTO M 297. The minimum width of uninstalled Compression Seal shall be 1.25 times the width of bridge open joint.

d. The **Traffic Bearing Plate** shall meet the requirements specified in ASTM A 36, ASTM A 123, and AASHTO M 111.

e. The **Galvanized Pins** shall be 16D galvanized common nails and shall be placed through the holes in the Traffic Bearing Plate and down into the bridge open joint. The Galvanized Pins shall meet the requirements specified in ASTM A 123, and AASHTO M 111.

f. The **Backer Rod** shall be compressible, non-shrinkable, non-absorptive, and non-reactive with the joint sealant, such as stitched cotton piping cord, closed cell polyethylene foam rod, neoprene foam rubber or approved equal. The Backer Rod shall meet the requirements specified in ASTM D 5249.

g. The **Asphalt Primer** shall meet the requirements specified in ASTM D 41 and AASHTO M 116.

h. The **Reinforced Elastomeric Pad** shall meet the requirements of Specification 717 – "Elastomeric Bearings". The Reinforced Elastomeric Pad shall be laminated bearings consisting of layers of elastomer restrained at their interfaces by bonded laminates. The elastomer portion shall be 100 percent virgin chloroprene (neoprene) with a durometer of 50.

i. The **Steel Reinforcement** shall meet the requirements of Specification 602 – "Steel Reinforcing".

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j. The **Hot Poured Joint Sealant** shall be a single component, hot-applied, polymer modified, asphalt base joint sealant to fill joints in bituminous and concrete substrates in hot climates. The hot poured joint sealant shall meet the requirements of AASHTO M 301 and ASTM D 3405.

939-2.11 Sampling and Testing - Acceptance and laboratory testing will be performed by the Authority.

a. Compliance with the requirements included in the above articles will be determined in accordance with the following AASHTO and ASTM standards:

Sampling Fresh Concrete……	T 141
▪ Standard Test Method for Compressive Properties of Rigid Plastics……..	D 695
Size of Aggregates……..……..……...	T 27
Consistency (Slump)…….……..….....	T 119
Weight per Cu. Ft. and Air Content……..……..…	T 121

b. Sampling frequency for compressive strength testing shall be one set of six specimens shall be obtained from each lot of 3.0 cubic meters or fraction thereof placed of Header Material per bridge for testing. The specimens shall be taken, handled and transported by the Contractor to the designated laboratory, under the supervision of the Material Testing Office representative and the Engineer. It shall be the Contractor's responsibility to coordinate the presence of a Material Testing Office representative, as well as with the designated laboratory, if delivery of the specimens is to be made outside of the laboratory normal working hours. All testing for acceptance shall be based only on the concrete cylinder samples obtained from each lot during mix placement operation.

c. The transportation of the specimens is the responsibility of the Contractor and requires special handling by the Contractor. In addition, the transportation from the project site to the designated PRHTA Materials Testing Laboratory shall be performed under the direct supervision of the Engineer. It shall be the Contractor's responsibility to coordinate transportation at least 36 hours in advance of the proposed pour with the Engineer and PRHTA Material Testing Office laboratory. As a minimum, the Contractor shall assure that specimens are enclosed in a rigid container and that they be surrounded by a minimum of three inches of adequate padding material around each specimen. The Contractor shall properly secure the transportation container in order to prevent excessive movement that may cause contact between the specimens.

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The Contractor shall furnish at no additional cost to the Authority all personnel, materials, and equipment necessary to comply with these requirements.

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d. Additional sets of specimens will be made as needed to determine when a structure may be put into service or if the Engineer deems it necessary to determine the acceptability of Header Material. No additional cost to the Authority will be made for any additional set.

e. The Contractor shall furnish at his expense all metal molds or single use plastic molds with lids, conforming AASHTO and ASTM applicable standards that are necessary to comply with the required frequency of sampling. As a subsidiary obligation, when using single use plastic molds, the Contractor shall furnish stripping tools such as Gilson HM160, Humbold H-3041S/H-3041SM, Myers ST-1/ST-2, or approved equal or equivalent for removing the sample from the mold. Cardboard molds will not be accepted.

f. Slump tests, tests when applicable, shall be made from each batch of lot of 3.0 cubic meters or fraction thereof placed of Header Material per bridge from which test specimens are taken. These tests will be made by the Contractor. Additional slump tests could be required as determined by the Engineer to check the consistency of the Header Material.

g. Samples of each Type of Header Material will be taken of the fresh mix in situ or delivered to the project by the Contractor under the direction and supervision of the Engineer. For these samples, the mortar will be washed out and the remaining aggregates will be tested for compliance with the requirements of Articles 939-2.06 of this specification.

h. All of the field sampling tests requirements for fresh concrete included in this section shall be performed by a certified technician as determined by the Engineer and under his supervision. The certified technician shall possess an active Field Testing Technician Certification from the ACT Technician Training Certification Program or an active certification from American Concrete Institute as Field Testing Technician Grade I.

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939-2.12 Basis of Acceptance of each Type of Header Material

a. In general, the acceptability of the quality of each Type of the Header Material delivered to or made at the jobsite will be based on slump tests, air content test, aggregate tests and on the results of standard compressive strength tests of representative samples as covered by these specifications. However, this does not relieve the responsibility of the Contractor for the Header Material during placement, consolidation, finishing, curing and protection prior to final acceptance by the Authority.

b. Failure of the Coarse Aggregate to meet the polishing value requirements shall be cause for the rejection and removal of each Type of Header Material for use on vehicular travel ways.

c. The compressive strength of the quantity of each Type of Header Material placed and represented by one set of specimens shall be determined as the average of the three specimens comprising the set. If the Engineer determined that any cylinder shows evidence of improper sampling, molding, handling, curing or testing, the test result of such defective cylinder shall be discarded and the compressive strength of the each Type of Header Material represented shall be determined from the test results of the remaining specimens. Low strength shall not be a basis for discarding a cylinder test result.

d. The compressive strength level of each Type of Header Material will be considered satisfactory if both of the following requirements are met:

    l. The average of all sets of three strength tests equals or exceeds the specified compressive strength for all types of Header Material.

    2. No individual strength test (average of cylinder set) falls below the specified compressive strength by more than 500 psi.

e. When the average of all sets of each Type of Header Material fails to meet the compressive strength requirement, the Header Material will be considered deficient but will be accepted if the deficiency in the average does not exceed 500 psi, but payment for the Header Material by the failing averages will be paid for at the reduced unit price as specified in Article 939-5.08.

f. Should each Type of Header Material used in the work fail to conform to the requirements in paragraph “d” above, the Contractor shall, at his expense, make corrective changes, subject to the approval of the Engineer, in the

material mix proportions or in the Header Material fabrication procedures, before placing additional Header Material.

g. All Header Material represented by a cylinder set which shows a strength falling below the specified value by more than 500 psi will be considered deficient and will be rejected. Such lots may be accepted at the discretion of the Authority at a reduced price to be determined by the Authority on the basis of inspection and evaluation of the deficient Header Material under traffic.

h. Retesting shall not be permitted.

i. Each Type of Header Material that fails the specimen strength tests acceptance criteria is rejected and shall be removed and disposed of at the Contractor's expense. In some cases, the location of rejected Header Material may be such as to require the removal, at the Contractor's expense, of otherwise satisfactory Header Material. The removal shall be performed in such a manner as will not cause damage to the remaining Header Material or to other units of the structure.

939-3 CONSTRUCTION REQUIREMENTS

939-3.01 General

a. The repairs of the bridge joint system shall be performed according to the details and notes shown on plans or as ordered by the Engineer.

b. The joint repair operations will be conducted in half width of bridge at a time and in a manner that offers minimum inconvenience to public traffic. The work shall be accomplished in coordination with other operations in progress within an area. Speed control measurements shall be in place when traffic is allowed through the bridge and until final curing is completed. Speed control measurements are subsidiary item of Header Material.

939-3.02 Equipment

a. The Contractor shall use sawing equipment adequate in size and power to saw cut the joints and other sides of the areas to be repair to the required widths and depths.

b. A lightweight power chipping hammer or hand tools shall be used for removal of defective concrete. The lightweight power chipping hammer shall be

pneumatic or electric hammers and these shall not be heavier than **20 pounds**. The lightweight power hammers, and chipping tools shall not be operated at an angle exceeding 60 degrees relative to the surface of the bridge deck or approach slabs. Such tools may be started in the vertical position but must be immediately tilted to a 60 degree operation angle.

939-3.03 Preparation for Bridge Joint Repair

a. For Partial Repair of Bridge Joint System:

1. The Contractor shall remove the asphalt or concrete patch or overlay over bridge open joint with a lightweight power chipping hammer or hand tools, if it applies. The Contractor shall remove the existing bridge joint system in armored and armorless joint.

2. The following preparation applies to armorless joint only.

(a) If it applies, the Contractor shall cut to a maximum depth of 0.10 meter with a saw cutting equipment. The minimum distance for the limit of saw cutting shall be 0.013 meter in both sides of bridge open joint. All cuts shall be made at right angles as shown on the details.

(b) If it applies, after the limit of saw cutting is defined, the existing concrete shall be removed carefully with a lightweight power chipping hammer. Remove the debris and clean the surface.

(c) Grinding the damaged corners and the surface of blockout. All surfaces of blockout and the existing steel reinforcement shall be dried, cleaned, free from all dust, laitance oil, and foreign material before applying the Corrosion Inhibitor.

(d) All surfaces of blockout and the existing steel reinforcement shall be treated with a Corrosion Inhibitor.

b. For Full Repair of Bridge Joint System:

1. The Contractor shall remove the asphalt or concrete patch or overlay over bridge open joint with a lightweight power chipping hammer or hand tools, if it applies. The Contractor shall remove the existing bridge joint system and the steel angles, if it applies.

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2. The Contractor shall cut to a maximum depth of 0.025 meter with a sawing equipment and avoid the cutting of the existing steel reinforcement. The minimum distance for limit of saw cutting shall be 0.30 meter in both sides of bridge open joint. All cuts shall be made at right angles as shown on the details.

3. After the limit of saw cutting is defined, the existing concrete shall be removed carefully with a lightweight power chipping hammer. Remove the debris and clean the surface.

4. The existing steel reinforcement shall not be damaged, and it shall remain during the removal of the existing concrete. The existing steel reinforcement shall be cleaned with water blasting in all corroded or dirty areas.

5. Install the new steel reinforcement in each side of blockout, if it applies.

6. All surfaces of concrete slab to be repaired and steel reinforcement shall be dried, cleaned, free from all dust, laitance oil, and any foreign material before applying the Structural Bonding Agent and placing the Header Material.

7. All surfaces of concrete slab to be repaired shall be treated with a Structural Bonding Agent before placing the Header Material. The Structural Bonding Agent shall be broomed into the surface with a stiff bristle broom. The thickness of application shall be an average of 20 to 25 mils. If the concrete substrate absorbs the Structural Bonding Agent, another coat shall be applied.

8. Place in situ the Header Material. The Header Material shall meet the requirements of this specification.

9. The Header Material shall be cured in accordance of the Article **939-3.04** of this specification.

10. The Contractor shall apply a Structural Crack Healer / Sealer between the Header Material and existing concrete slab at top of construction joint.

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939-3.04 Curing of Header Material

a. General

1. Curing shall be initiated immediately after placing and finishing. Improperly cured Header Material will be considered defective and the Engineer will stop all the Contractor's mix placing operations until proper curing procedures are put into effect.

2. The Polymer Concrete and Elastomeric Concrete shall be cured as recommended by the Product's Manufacturer.

3. **Intentionally Omitted**.

4. The Contractor will be held responsible for any cracking of the Header Material and will be the Contractor's responsibility to repair or remove and replace the affected Header Material at no cost to the Authority.

939-3.05 Installation of Bridge Joint System

a. The Bridge Joint System shall be of the following types as indicated on plans or contract documents: *Concrete Bridge Joint System*, *Asphaltic Bridge Joint System*, *Longitudinal Bridge Joint System*, *Special Concrete Bridge Joint System* or *Special Asphaltic Bridge Joint System*.

b. The *Concrete Bridge Joint System* shall be installed as follows:

1. Apply the Adhesive-Lubricant to the Header Material, existing concrete or steel angles surface as it applies.

2. Install new Compression Seal and Silicone Joint Sealant.

c. The *Asphaltic Bridge Joint System* shall be installed as follows:

1. Apply the Structural Bonding Agent in one side of open joint over Header Material, existing concrete slab or steel angles as it applies.

2. Install the Traffic Bearing Plate with Backer Rod, Expansion Gap, Galvanized Pins and other accessories.

3. Apply the Asphalt Primer to the surfaces of Header Material, concrete slab and vertical sides of bituminous surface course.

4. Place the Asphalt Binder Material between bituminous surface course.

d. The *Longitudinal Bridge Joint System* shall be installed as follows:

1. Apply the Adhesive-Lubricant to the concrete surface as it applies in the types of bridge joint systems.

2. Install new Compression Seal for concrete joint system or Reinforced Elastomeric Pad for asphaltic joint system, and Silicone Joint Sealant.
3. For asphaltic joint system only, apply the Asphalt Primer to the surfaces of concrete slab, tar paper, and vertical sides of bituminous surface course.

4. For asphaltic joint system only, place the Asphalt Binder Material between bituminous surface course.

e. The *Special Concrete Bridge Joint System* shall be installed as follows:

1. Use the procedures for Full Bridge Joint Repair in accordance of the Article 939-3.03b of this specification.

2. Apply the Adhesive-Lubricant to the Header Material.

3. Install new Compression Seal.

f. The *Special Asphaltic Bridge Joint System* shall be installed as follows:

1. Use the procedures for Full Bridge Joint Repair in accordance of the Article 939-3.03b of this specification.

2. Apply the Adhesive-Lubricant in one side of open joint over Header Material.

3. Install the Reinforced Elastomeric Pads, Silicone Joint Sealant, tar paper, and other accessories.

4. Apply the Asphalt Primer to the surfaces of concrete slab, tar paper, and vertical sides of bituminous surface course.

5. Place the Asphalt Binder Material between bituminous surface course.

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939-4 METHOD OF MEASUREMENT

939-4.01 The *Header Material* will be measured by the cubic meter or linear meter in accordance with the dimensions of each Type shown on the plans or ordered by the Engineer.

939-4.02 The *Concrete Bridge Joint System* will be measured by the linear meter of Bridge Joint System completed and accepted.

939-4.03 The *Asphaltic Bridge Joint System* will be measured by the linear meter of Bridge Joint System completed and accepted.

939-4.04 The *Longitudinal Bridge Joint System* will be measured by the linear meter of Bridge Joint System completed and accepted.

939-4.05 The *Special Concrete Bridge Joint System* will be measured by the linear meter of Bridge Joint System completed and accepted.

939-4.06 The *Special Asphaltic Bridge Joint System* will be measured by the linear meter of Bridge Joint System completed and accepted.

939-4.07 The *Sealing of Construction Joints in Bridge Joint System* will be measured by the linear meter of construction joint sealed and accepted. No separate measurement will be made for construction joints ordered by the Engineer to be re-sealed due to improper installation or damages caused by the Contractor's operations.

939-4.08 Each Type of Header Material for the test specimens will not be measured for payment but shall be a subsidiary obligation of the Contractor.

939-5 BASIS OF PAYMENT

939-5.01 Header Material (Type)

a. The completed and accepted quantities of each Type of *Header Material*, measured as Article 939-4.01, will be paid for at the contract unit price per unit of measurement except as specified in Article 939-5.08. Such prices and payment shall constitute full compensation for all saw cutting, cleaning, placing, finishing and curing, including the furnishing of all required materials, and for all equipment, tools, labor and incidentals necessary to complete each item as required by the plans and specifications.

b. The unit prices of each Type of Header Material include full compensation for furnishing, cleaning and placing or applying all subsidiary items necessary to complete the bridge open joint repair such as Structural Bonding Agent, Structural Crack Healer / Sealer and Miscellaneous Materials called for in the contract documents unless they constitute or are specifically covered by other pay items included in the contract.

c. The full compensation for furnishing of equipments and operations for removal of existing bituminous or concrete patchs on bridge concrete deck shall be a subsidiary obligation of the Contractor under the pay item for each Type of Header Material.

d. No separate pay allowance will be made for any increased cement content, for any admixtures, nor for any finishing of any description for concrete surfaces indicated on the plans or required by the specifications.

e. No additional payment will be made for any Type of Header Material over dimensions stipulated in the contract documents nor for strength in excess of that specified. No payment will be made for the removal and disposal of any Type of Header Material found deficient and not accepted.

939-5.02 Concrete Bridge Joint System

a. The completed and accepted quantities of *Concrete Bridge Joint System*, measured as Article 939-4.02, will be paid for at the contract unit price per unit of measurement. Such prices and payment shall constitute full compensation for all saw cutting, cleaning, placing and curing, including the furnishing of all required materials, and for all equipment, tools, labor and incidentals necessary to complete each item as required by the plans and specifications.

b. The unit prices of Concrete Bridge Joint System include full compensation for furnishing, cleaning and placing or applying all subsidiary items necessary to complete this bridge joint system such as Premolded Joint Filler, Adhesive-Lubricant, Compression Seal, Silicone Joint Sealant, Corrosion Inhibitor, and Miscellaneous Materials called for in the contract documents unless they constitute or are specifically covered by other pay items included in the contract.

c. The full compensation for furnishing of equipments and operations for removal of existing bridge joint systems shall be a subsidiary obligation of the Contractor under the pay item for Concrete Bridge Joint System.

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939-5.03 Asphaltic Bridge Joint System

a. The completed and accepted quantities of *Asphaltic Bridge Joint System*, measured as Article 939-4.03, will be paid for at the contract unit price per unit of measurement. Such prices and payment shall constitute full compensation for all the saw cutting, removal, cleaning, placing and curing, including the furnishing of all required materials, and for all equipment, tools, labor and incidentals necessary to complete each item as required by the plans and specifications.

b. The unit prices of Asphaltic Bridge Joint System include full compensation for furnishing, cleaning and placing or applying all subsidiary items necessary to complete this bridge joint system such as Traffic Bearing Plate, Premolded Joint Filler, Backer Rod, Expansion Gap, Galvanized Pins, Adhesive-Lubricant, Structural Bonding Agent, Asphalt Primer, Asphalt Binder Material, Corrosion Inhibitor, and Miscellaneous Materials called for in the contract documents unless they constitute or are specifically covered by other pay items included in the contract.

c. The full compensation for furnishing of equipments and operations for removal of existing bridge joint systems shall be a subsidiary obligation of the Contractor under the pay item for Asphaltic Bridge Joint System.

939-5.04 Longitudinal Bridge Joint System

a. The completed and accepted quantities of *Longitudinal Bridge Joint System*, measured as Article 939-4.04, will be paid for at the contract unit price per unit of measurement. Such prices and payment shall constitute full compensation for all saw cutting, cleaning, placing and curing, including the furnishing of all required materials, and for all equipment, tools, labor and incidentals necessary to complete each item as required by the plans and specifications.

b. The unit prices of Longitudinal Bridge Joint System include full compensation for furnishing, cleaning and placing or applying all subsidiary items necessary to complete this bridge joint system such as Premolded Joint Filler, Adhesive-Lubricant, and Compression Seal for concrete joint system or Reinforced Elastomeric Pad, tar paper, Asphalt Primer and Asphalt Binder Material for asphaltic joint system, Silicone Joint Sealant, and Miscellaneous Materials called for in the contract documents unless they constitute or are specifically covered by other pay items included in the contract.

c. The full compensation for furnishing of equipments and operations for removal of existing bridge joint systems shall be a subsidiary obligation of the Contractor under the pay item for Longitudinal Bridge Joint System.

939-5.05 Special Concrete Bridge Joint System

a. The completed and accepted quantities of *Special Concrete Bridge Joint System*, measured as Article 939-4.05, will be paid for at the contract unit price per unit of measurement. Such prices and payment shall constitute full compensation for all saw cutting, cleaning, placing and curing, including the furnishing of all required materials, and for all equipment, tools, labor and incidentals necessary to complete each item as required by the plans and specifications.

b. The unit prices of Special Concrete Bridge Joint System include full compensation for furnishing, cleaning and placing or applying all subsidiary items necessary to complete this bridge joint system such as Premolded Joint Filler, Adhesive-Lubricant, Compression Seal, Steel Reinforcement, and Miscellaneous Materials called for in the contract documents unless they constitute or are specifically covered by other pay items included in the contract.

c. The full compensation for furnishing of equipments and operations for removal of existing bridge joint systems shall be a subsidiary obligation of the Contractor under the pay item for Special Concrete Bridge Joint System.

939-5.06 Special Asphaltic Bridge Joint System

a. The completed and accepted quantities of *Special Asphaltic Bridge Joint System*, measured as Article 939-4.06, will be paid for at the contract unit price per unit of measurement. Such prices and payment shall constitute full compensation for all the saw cutting, removal, cleaning, placing and curing, including the furnishing of all required materials, and for all equipment, tools, labor and incidentals necessary to complete each item as required by the plans and specifications.

b. The unit prices of Special Asphaltic Bridge Joint System include full compensation for furnishing, cleaning and placing or applying all subsidiary items necessary to complete this bridge joint system such as Reinforced Elastomeric Pad, Premolded Joint Filler, Silicone Joint Sealant, Adhesive-Lubricant, Structural Bonding Agent, tar paper, Asphalt Primer, Asphalt

Binder Material, and Miscellaneous Materials called for in the contract documents unless they constitute or are specifically covered by other pay items included in the contract.

c. The full compensation for furnishing of equipments and operations for removal of existing bridge joint systems shall be a subsidiary obligation of the Contractor under the pay item for Special Asphaltic Bridge Joint System.

939-5.07 Sealing of Construction Joints in Bridge Joint Systems – The completed and accepted quantities of *Sealing of Construction Joints in Bridge Joint System*, measured as Article 939-4.07, will be paid for at the contract unit price per unit of measurement. Such prices and payment shall constitute full compensation for all saw cutting, cleaning and sealing, including the furnishing and placing or applying of Structural Crack Healer / Sealer and all required materials, and for all equipment, tools, labor and incidentals necessary to complete each item as required by the plans and specifications.

939-5.08 Price Reduction – Each Type of Header Material found deficient in strength but which is accepted by the Authority under the provision of Article 939-2.12 of this specification will be paid for at a reduced unit price.

a. The reduction in unit price of each Type of Header Material will be computed in accordance with the following formula:

$R = 0.05 D$

where R = Percentage reduction in unit price of the Header Material.

D = Deficiency in psi from the specified strength.

b. The price reduction will be applied to the lot represented by the strength test subject to the following:

1. No price reduction will be applied when the deficiency "D" does not exceed 100 psi.

2. Drilling and testing cores shall not be permitted for price reduction.

SPECIAL PROVISION

SPECIFICATION 939 - BRIDGE JOINT SYSTEM REPAIR

939-5.09 Payment will be made under:

Pay Item	**Pay Unit**
Header Material (Polymer Concrete).....	Cubic Meter or Linear Meter
Header Material (Elastomeric Concrete).....	Cubic Meter or Linear Meter
Concrete Bridge Joint System, Type __.....	Linear Meter
Asphaltic Bridge Joint System, Type __.....	Linear Meter
Longitudinal Bridge Joint System, Type __.....	Linear Meter
Special Concrete Bridge Joint System…….....	Linear Meter
Special Asphaltic Bridge Joint System…….....	Linear Meter
Sealing of Construction Joints in Bridge Joint System...……....	Linear Meter