June 18, 2021
PREPARED BY: CLH

Pine Island Bridge Repairs

SPECIFICATIONS PACKAGE

DISTRICT ONE
LEE COUNTY

The July 2021 Edition of the Florida Department of Transportation Standard Specifications is revised as follows:

I hereby certify that this specifications package has been properly prepared by me, or under my responsible charge, in accordance with procedures adopted by the Florida Department of Transportation.

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Thomas M. Waits P.E, State of Florida, Professional Engineer, License No. 55460

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Date: _____
State of Florida,
Professional Engineer, License No.: Thomas M. Waits, P.E., 55460
Firm/Agency Name: HighSpans Engineering, Inc.
Firm/Agency Address: 2121 McGregor Blvd., Suite 200
City, State, Zip Code: Fort Myers, FL 33901
Pages: 1 – 9

THOMAS M. WAITS LICENSE No 55460 STATE OF FLORIDA PROFESSIONAL ENGINEER

Thomas M Waits
HighSpans Engineering, Inc.
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BITUMINOUS CRACK AND JOINT SEALING.

(6-4-12)

The following new Section is inserted after Section 300.

SECTION 305
BITUMINOUS CRACK AND JOINT SEALING

305-1 Description.

Clean and seal joints and cracks in asphalt concrete roadway surfaces using the Cut and Seal method or the Crack Fill method.

305-2 Materials.

305-2.1 General Requirements: Use only hot applied sealants as described in this specification. Use either asphalt rubber or polymer modified asphalt rubber sealants as shown in the Contract Documents. Certify that each lot of premixed material meets the requirements of this Section and submit the test results of each lot used. Deliver each lot of sealant in containers with the manufacturer's name and lot number plainly marked.

305-2.2 Asphalt Rubber Binder Joint and Crack Sealer: Meet the following requirements:

305-2.2.1 Rubber Type and Content: Use ambient ground rubber at 18 plus or minus 1% by weight of virgin asphalt cement meeting the following gradation requirements:

Sieve Size	Percent Passing
No. 10	100
No. 16	95 to 100
No. 30	40 to 80
No. 80	0 to 5

305-2.2.2 Workability: The mixture pours readily and penetrates a 0.25 inch pavement joint or crack to a depth of at least 1.0 inch when the application temperature of the fully reacted mixture is 350ºF and the air temperature is 35ºF or higher.

305-2.2.3 Curing: The mixture, when placed in conventional field installation equipment, readily melts to a pumping consistency after being heated to 400°F for 2 hours maximum. The mixture remains in a pumping consistency when the temperature of the field installation equipment is reduced to the normal operating temperature range of 300ºF to 350ºF.

305-2.2.4 Softening Point: The minimum softening point shall be 185ºF when tested in accordance with ASTM D36.

305-2.2.5 Flexibility: Bend a 0.125 inch thick x 1.0 inch wide x 6.0 inches long mixture specimen after conditioning to 10.0ºF at a minimum bending rate of 9 degrees per second (10 seconds maximum for a 90º bend) over a 1.0 inch diameter mandrel without cracking in accordance with ASTM D3111.

305-2.2.6 Separation: Test for phase separation by pouring a representative sample of the mixture into aluminum tubes 1.0 inch in diameter and 5.5 inches long as described in AASHTO PP5. Cure the samples at 325ºF for 48 hours. Take samples from the top and bottom of the tube and determine the softening point as described in ASTM D36. Average the test

results from the top and bottom samples. If there is 4.0% or more difference between the average test result and either of the top or bottom test results, reject the mixture due to separation.

305-2.2.7 Adhesion: When cooled, the mixture shall bond strongly to both asphalt and concrete pavement surfaces. The mixture shall contain no materials that chemically react with these surfaces to reduce the short-term and long-term adhesion bonds.

305-2.3 Polymer Modified Asphalt Rubber Binder Joint and Crack Sealer: In addition to the requirements provided in 305-2.2, meet the following additional requirements:

Property	Specification
Cone Penetration, 77.0ºF (ASTM D5329)	30 - 60 dmm
Resilience, 77.0ºF, % Recovery (ASTM D5329)	30% minimum
Ductility, 77ºF, 50 mm/minute (AASHTO T 51)	300 mm minimum
Asphalt Compatibility (ASTM D3407)	Pass
Bitumen Content (ASTM D4)	60% minimum
Tensile Adhesion (ASTM D3583)	500% minimum
Rotational Viscosity (Brookfield), No. 5 spindle, 20 RPM, 400 ºF (AASHTO T 316)	3,000 – 15,000 cp

305-2.4 Delivery, Storage, and Handling: Package the premixed sealant material in units weighing no more than 30 pounds with a maximum of two 30-pound units per shipping container. Ensure that the plastic film used to package the units melts at normal application temperatures when placed in the installation equipment.

305-2.5 Field Performance: There shall be no pulling or tracking of the in-place crack sealant material by vehicle traffic after 20 minutes of material application. Failure to meet this requirement is cause for rejection of the material regardless of specified laboratory test results.

305-3 Equipment.

Use field equipment that produces or maintains specified temperatures, even if filled to capacity. Ensure that the equipment produces or maintains a homogeneous mixture of asphalt and rubber at a uniform temperature without hot or cool spots or segregation in the mixture. Ensure that the equipment for filling the joints and cracks directs the sealant into the crack. Ensure that the air compressors are satisfactory to the Engineer.

305-4 Construction.

305-4.1 General: All single transverse cracks in the travel lanes shall be sealed by the Cut and Seal method. All other cracks in the travel lanes, shoulders, and other auxiliary areas may be filled by either the Cut and Seal method or the Crack Fill method. Do not begin operations when the ambient air temperature is less than 40°F or when the roadway surface is moist.

305-4.2 Cut and Seal Method: Cut, clean and seal cracks and joints that are 1/16 inch or greater in width. Cut along the crack or joint to construct a uniform rectangular reservoir in which the sealant is to be placed. The reservoir shall be between 1/2 inch and 3/4 inch in width. The depth of the reservoir shall be between 1/2 inch and 1 inch. The cut reservoir shall have vertical, intact sides with no loosely bonded aggregate. Following cutting, the reservoir shall be cleaned using the air blast method or other acceptable method. The reservoir shall be inspected prior to the application of the sealant to ensure that it is clean, dry, and free of dirt, debris, adhered fines, or other contamination. If reservoirs are not clean and dry, they shall be re-cleaned to achieve the required condition. Sealant shall be applied to slightly overfill the reservoir and

then struck off using a “V” shaped squeegee. The remaining squeegee material shall be flush with the pavement surface. In no case shall the remaining material be lower than the pavement surface or exceed 1/16 inch above the pavement surface. In no case shall the width of excess material on the pavement surface exceed 3 inches.

305-4.3 Crack Fill Method: Clean and seal joints and cracks that are 1/16 inch or greater in width. Clean joints and cracks with air blast cleaning or other acceptable methods to a depth of at least twice the joint or crack width. Joints and cracks shall be inspected prior to the application of the sealant to ensure that they are clean, dry, and free of dirt, debris, adhered fines, or other contamination. Apply sealing material with a pressure nozzle. Completely fill cracks and joints. Sealant shall be applied to slightly overfill the crack or joint and then struck off using a “V” shaped squeegee. The remaining squeegee material shall be flush with the pavement surface. In no case shall the remaining material be lower than the pavement surface or exceed 1/16 inch above the pavement surface. In no case shall the width of excess material on the pavement surface exceed 3 inches.

305-4.4 Other: Prevent tracking with an application of fine sand, unless it can be demonstrated that the crack and joint sealer will not track without the application of sand. Other methods may be used if approved by the Engineer. Repair any pavement striping or markings affected by the application of crack and joint sealer. Repair any pavement striping or markings using material meeting the Department’s specifications.

305-5 Method of Measurement.

The quantity of crack sealing to be paid for will be the linear feet of cracks or joints completed and accepted, determined by field measure.

305-6 Basis of Payment.

Price and payment will be full compensation for furnishing all materials and performing the work specified in this Section.

Item No. 305- 1- Bituminous Crack and Joint Sealing - per linear feet.

INTEGRAL PILE AND COLUMN JACKETS.
(REV 11-22-19) (FA 1-27-20) (7-21)

The following new Section is added after Section 455:

SECTION 457
INTEGRAL PILE AND COLUMN JACKETS

457-1 Description.

Furnish, fabricate and install an integral pile and column jacket in accordance with the Contract Documents.

457-2 Materials.

457-2.1 Stay-In-Place Forms: Use forms composed of a durable, inert, corrosion resistant material with an interlocking joint along one or two sides that permits the form to be assembled and sealed in place around the pile or column. Fabricate the forms from glass or carbon fibers and polyester or vinylester resins. Provide jackets with a minimum thickness of 1/8 inch with a minimum thickness at the corners of 3/16 inch and dimensions as shown in the Contract Documents. Ensure the form is capable of maintaining its original shape without additional support or damage when placed around a pile. Ensure the inside face of the form has no bond inhibiting agents in contact with the filler material. Provide the forms with bonded or bolted-on, non-metallic, adjustable standoffs to maintain the forms in the required positions. Sandblast or score the inside surface of the forms with an abrasive material to provide a rough surface texture and ensure bond with the filler material. Equip the forms with a compressible sealing strip at the bottom which will effectively seal the annular space between the pile or column and the form. Use non-metallic hardware for pumping ports when these are provided. Fabricate the jacket form in a workmanlike manner and have it inspected and approved by the Engineer prior to placement. Remove from the project any jacket form that has been rejected.

The forms shall meet the following physical property requirements of Table 1:

Table 1: Physical Requirements of Stay-In-Place Forms	
Water Absorption (ASTM D 570)	1% maximum
Ultimate Tensile Strength (ASTM D 638)*	9,000 psi minimum
Flexural Strength (ASTM D 790)*	16,000 psi minimum
Modulus of Elasticity (ASTM D 790)	700,000 psi minimum
IZOD Impact (ASTM D 256)	15 lb/inch minimum (unnotched specimen)
Barcol Hardness (ASTM D 2583)	45 minimum number
Color: Similar to Federal Color Standard No. 595, Table VII, Shade No. 36622. The color must be integral in the form gel coat.	
* On original specimens whose flat surfaces are not machined to disturb the fiberglass.	

457-2.2 Anode Material: Use expanded mesh anodes pre-installed inside the form by the manufacturer when cathodic protection integral pile or column jackets are specified. Use anode type and configuration shown in the Contract Documents. If galvanic anodes are used, place the anodes in direct contact with the inside face of the form.

457-2.3 Fillers: Use portland cement grout fillers for non-structural jackets and portland cement concrete fillers for structural jackets. Use special fillers when required by Contract Documents. Submit the filler mix design to the Department for approval.

Hardened portland cement grout, portland cement concrete, and special fillers will be accepted based on strength test results as defined in this Section. Test the compressive strength of the laboratory cured samples at 28 days in a laboratory meeting the qualification requirements listed in 105-6.

Total amount of chlorides for jacket fillers shall not exceed 0.4 pounds per cubic yard of filler after placement. When directed by the Engineer, randomly select samples to determine the total amount of chlorides meeting the requirements of Section 346.

457-2.3.1 Portland Cement Grout Fillers: Use a mix design of portland cement, fine aggregate, water, and an admixture(s) along with a minimum of 940 pounds of cementitious material per cubic yard. Up to 30%, by weight of cement may be replaced by fly ash for standard pile jackets. Do not use fly ash, slag, or silica fume for cathodic protection jackets, unless specified in the Contract Documents.

457-2.3.1.1 Materials: Meet the following requirements:

Silica Sand Fine Aggregate*.....Section 902
Portland Cement and Blended Cement.....Section 921
Water.....Section 923
Admixtures Types A, D, and air entraining**.....Section 924
Supplementary Cementitious Materials***.....Section 929

*Use only silica sand, except as provided in 902-5.2.3.

**Use products listed on the Department's Approved Product List (APL) and containing no chlorides or other salts corrosive to metals. Do not use materials containing hard lumps, crusts or frozen matter, or that is contaminated with materials exceeding the specified limits in the above listed Sections.

***Use fly ash meeting the requirements of Section 929, ASTM C618, Type F, except that loss on ignition shall not exceed 4%.

457-2.3.2 Portland Cement Concrete Fillers: Use Class IV Concrete meeting the requirements of Section 346 with an adjusted slump of 7 inches to 9 inches. Reduced size coarse aggregate may be used as approved by the Engineer. Do not use fly ash, slag, or silica fume for cathodic protection jackets.

457-2.3.3 Special Fillers: Use prebagged special fillers meeting the requirements of Section 930. Provide material data sheet and certification that the fillers meet the APL requirements of Section 6.

457-2.4 Water: Use water that meets the requirements of Section 923 for all filler mixing. Use potable water for cleaning, rinsing, or any other application that requires direct contact with the piles.

457-2.5 Reinforcing Steel: Use reinforcing steel meeting the requirements of Section 415 for all structural jackets.

457-2.6 Materials Certification and Testing.

457-2.6.1 Certification: For materials other than those for portland cement grout and portland cement concrete, submit a certificate to the Engineer certifying that the materials furnished meet all the requirements of this Section and conform to the materials tested. Attach current test reports to the certificate.

When cathodic protection jackets are specified, submit certified test results of the chemical composition of the anode and submit a manufacturer certification stating that the dimensions and physical characteristics of the anode meet the requirements of the Contract Documents.

No test report for tests made more than two years prior to shipment will be accepted for the form and anode material.

457-2.6.2 Sampling and Testing of Portland Cement Grout Fillers: Sample and test the portland cement grout fillers at a frequency of one sample per LOT in accordance with Section 346 using Quality Control technicians meeting the requirements of Section 105. The maximum LOT size is 50 cy or one day's production, whichever is less.

457-2.6.3 Sampling and Testing of Portland Cement Concrete Fillers: Sample and test materials for Portland cement grout and Class IV concrete as required in Section 346. Perform sampling and testing using Quality Control technicians meeting the requirements of Section 105. Conduct test at a frequency of one set of tests per LOT. The maximum LOT size is 50 cy or one day's production, whichever is less.

457-2.6.4 Sampling and Testing of Special Fillers: Test properties of special filler materials meeting the requirement of Section 346 at a frequency of one set of tests per LOT. The maximum LOT size for special filler is 25 cy or one day's production whichever is less.

For each set of tests, cast three 4 inch by 8 inch cylinders for compressive strength testing at the required test date. Conduct a field demonstration of the mixing operations prior to commencing the jacket installation. Cure samples of special filler materials in accordance with ASTM C31.

457-3 Construction.

457-3.1 Shop Drawings: Submit shop drawings and obtain approval prior to field installation. Submit shop drawings showing locations of standoff spacers, method of fastening jacket form to piling, method of sealing the form after assembly, and method for bracing during placement of filler. Include details of access holes, fiberglass caps, method of securing anode from movement, and methods for placing the filler and sealing the pumping ports.

457-3.2 Surface Preparation: Remove all cracked or delaminated concrete and excavate to a depth of 3/4 inch to 1 inch behind the exposed reinforcement. Limit the size of chipping hammers to 20 pounds unless otherwise approved by the Engineer. Thoroughly clean all pile/column surfaces that the jackets will cover. Remove all oil, grease, dirt, broken concrete, marine growth and any other deleterious material that could prevent proper bonding. Mediablast all exposed reinforcing steel to SSPC-SP10, near white, per the Society of Protective Coatings, to remove all rust and scale before installing the pile jacket. Water blast or mechanically clean reinforcing steel exposed under water by methods and with equipment approved by the Engineer. Clean existing concrete surfaces by mediablasting, wet blasting, wire brushing, water laser, or other methods approved by the Engineer, which will yield an equivalent result. Do not place the form until the surface preparation has been approved by the Engineer.

457-3.3 Cathodic Protection: Provide connection to the reinforcement for cathodic protection integral pile jackets inside the jacket limits unless otherwise specified in the Contract Documents. Use connection methods and materials in accordance with the Contract Documents.

457-3.4 Form Placement: Place the fiberglass form in position around the pile; secure and seal the interlocking joints seal the bottom of the form against the pile surface with the compressible seal, and coat the compressible seal with an APL listed epoxy mastic suitable for

underwater application. Adjust stand-offs as necessary to prevent misalignment and install temporary hard backing to prevent deformation of the jacket. Place a temporary plastic wrap around the form prior to placement of the hardbacking to protect the gel coat.

457-3.5 Filler Placement: Wet to saturation the surface of the existing concrete immediately prior to placing the filler. Place the filler in one continuous pour at no more than 72 hours after final surface preparation. Fill the annulus between the pile or column and jacket form following the jacket manufacturer's instructions and the Contract Documents. Do not drop filler material into forms higher than five feet or into forms containing water. Prevent contamination of the filler during placement and provide internal or external vibration to ensure proper consolidation.

Cure filler for a minimum of 72 hours before removing any external bracing. Remove any filler or other extraneous material from the exterior surface of the form and clean the form without damaging the fiberglass or gel coat resin.

457-4 Method of Measurement.

The quantities to be paid for under this Section will be the total feet of integral pile or column jacket furnished, installed, completed and accepted. Measure length from bottom of the form to top of the form.

457-5 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section. No separate payment will be made for reinforcing steel or filler material. Include payment for anode material, anode connection accessories, testing, and activation in the price per foot for cathodic protection integral pile jackets. Remove and replace jackets with misalignment exceeding 3/4 inch or CP jackets with the anode electrically shorted to the reinforcement at no additional cost to the Department.

Payment will be made under:

Item No.	457- 1-	Standard Integral Pile Jacket - per foot.
Item No.	457- 2-	Cathodic Protection Integral Pile Jacket - per foot.