



Illinois Department of Transportation

2300 South Dirksen Parkway / Springfield, Illinois / 62764

February 22, 2022

SUBJECT FAI Route 55 (I-55)
Project NHPP-Q7Z4(321)
Section 2020-191-BR
DuPage County
Contract No. 62M64
Item No. 11, March 11, 2022 Letting
Addendum A

NOTICE TO PROSPECTIVE BIDDERS:

Attached is an addendum to the plans or proposal. This addendum involves revised and/or added material.

1. Revised the Schedule of Prices.
2. Revised page ii of the Table of Contents to the Special Provisions.
3. Revised pages 18-22 of the Special Provisions.
4. Added pages 165-166 to the Special Provisions.
5. Revised sheets 2-6, 14-26, 28, 29, 36 & 37 of the Plans.

Prime contractors must utilize the enclosed material when preparing their bid and must include any changes to the Schedule of Prices in their bid.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Jack A. Elston'.

Jack A. Elston, P.E.
Bureau Chief, Design and Environment

MTS

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Revised 2/22/2022

FAILURE TO OPEN TRAFFIC LANES TO TRAFFIC

Effective: March 22, 1996

Revised: February 9, 2005

Should the Contractor fail to completely open and keep open all the traffic lanes to traffic in accordance with the limitations specified under the Special Provisions for "Keeping the Expressway Open to Traffic", the Contractor shall be liable to the Department for the amount of:

One lane or ramp blocked = \$ 4,000

Two lanes blocked = \$ 9,000

Not as a penalty but as liquidated and ascertained damages for each and every 15 minute interval or a portion thereof that a lane is blocked outside the allowable time limitations. Such damages may be deducted by the Department from any monies due the Contractor. These damages shall apply during the contract time and during any extensions of the contract time.

FIBER WRAP REPAIR

Description

This work shall consist of furnishing all materials, labor, equipment and supervision necessary for the installation of externally bonded Fiber Reinforced Polymer (FRP) reinforcement, field applied at the locations shown in the plans and as directed by the Engineer.

Materials

The FRP composite system shall be a proprietary system consisting of all associated fiber reinforcement and polymer adhesives/resins. FRP composites consisting of fiber reinforcement and polymers provided by more than one Manufacturer are not allowed. The system shall be from one of the following companies:

BASF Corporation	SIKA Corporation	Fyfe Company, LLC
889 Valley Park Drive	201 Polito Ave.	8380 Miralani Drive
Shakopee, MN 55379	Lyndhurst NJ 07071	San Diego, CA 92126

The fabric for the FRP composite system shall be continuous filament woven fabric. Primary fibers for the fabric shall be electrical (E) glass fibers or Carbon. Acceptable fabrics are:

BASF Corporation.	SIKA Corporation	Fyfe Company, LLC
CF 130	HEX 103C	SCH-41
EG 900	HEX 100G	SEH-51A

The epoxy shall be supplied by the manufacturer as a part of the system designed for use with the selected fabric. Polyester resin shall not be allowed as a substitute for epoxy resin.

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Submittals

The Contractor shall submit to the Illinois Tollway at least three weeks prior to beginning installation the following information for approval:

Manufacturer's product data sheets indicating physical, mechanical and chemical characteristics of all materials used in the FRP system. Information should include manufacturer's name and product number for all materials. Information shall include dry fabric thickness and minimum effective composite thickness per layer. For epoxy resins it shall include mix ratio by weight and volume, pot life, shelf life, resin gel time at proposed cure temperatures, mixing and application instructions & temperature ranges, and storage requirements. For paint it shall include mixing instructions, application method, application temperature ranges and storage requirements.

Tensile properties of the composite material as determined by tensile testing in accordance with ASTM D 3039. Ultimate tensile strength and rupture strain values shall be determined by subtracting three standard deviations from the average values of twenty or more tensile tests.

Manufacturer's installation instructions, maintenance instructions and general recommendations regarding each material to be used. Installation instructions shall include curing procedures for the composite system if required.

Manufacturer's Material Safety Data Sheets (MSDS) for all materials to be used.

The material supplier's name, address, and phone number, and the name, telephone and fax number of a contact person employed by that company.

Complete, step-by-step procedures and specifications for repairs of any defects. Procedure shall specify that if a defective composite area is greater than 50 square inches, the defective area shall be repaired by removing and reapplying.

Complete, step-by-step procedures for repairs of any future defects or damage. Including recommendations for any periodic maintenance or inspections, if required. Also include recommended materials and procedures for future repainting including surface preparation.

Qualifications

The Manufacturer/Supplier must approve the Applicator. A field representative who has completed the course of instruction (supported by the Manufacturer / Supplier) in the installation of the products specified in this section must be present on site during installation of the FRP system.

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Delivery, Storage, And Handling

The products shall be delivered and stored in original, unopened containers. Containers must be clearly marked with legible and intact labels listing the Manufacturer's name, brand name, product identification and batch number.

Storage of fiber reinforcement and epoxies must be in areas protected from dust, moisture, and chemical exposure. Epoxies must be stored in areas with an ambient temperature between 50 and 75 degrees F and away from direct sunlight, flame sources or other hazards. Epoxy resins must be stored separately from hardeners.

The fiber reinforcement must not be handled roughly. For specific hazards of resin components consult the Manufacturer's MSDS.

CONSTRUCTION DETAILS

Surface Preparation

The surface shall be free from fins, sharp edges, and protrusions that will cause voids behind the casing or that, in the opinion of the Engineer, will damage the fiber.

The surfaces to receive the composite wrap shall be smooth and free of voids or undulations that would prevent full contact between the concrete and the wrap.

The contact surfaces shall be clean, free from oil, dirt, salt, etc., completely dry at the time of application of the composite. High pressure cleaning that would damage the surface will not be allowed. Newly repaired or patched surfaces that have set, and cured a minimum of 7 days, shall be coated with water-based epoxy paint or other approved sealer.

Application

- a. The ambient temperature and the temperature of the epoxy resin components shall be between 55° F and 95° F, or as recommended by the manufacturer, at the time of mixing. Care shall be taken to ensure that the surface temperature of the concrete that the FRP system is being applied to is within the appropriate range for the epoxy resins. The composite shall be applied when the relative humidity is less than 85% and the surface temperature is more than 5° F above the dew point. Applications shall begin within one hour after the batch has been mixed.
- b. The components of the epoxy resin shall be mixed with a mechanical mixer for a minimum of 5 minutes and applied uniformly to the fiber at a rate that shall insure complete saturation of the fabric.
- c. A primer of epoxy shall be applied to the surface to be wrapped.
- d. The FRP composite shall be applied to the prepared surface by wrapping using methods that produce a uniform force that is distributed across the entire width of the fabric. The primary fibers of the fabric shall not deviate from a vertical line more than 1/2 inch per foot, and the transverse fibers shall be perpendicular to the primary. Entrapped air shall be released or rolled over before the epoxy sets.

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- e. Beam repairs called for in this project shall consist of a single layer of fabric with any necessary splice overlap installed with the primary fibers oriented at a right angle to the longitudinal axis of the beam, providing shear reinforcement. If additional layers are required by the Engineer or recommended by the Manufacturer, successive layers of composite materials shall be placed before polymerization of the previous layer of epoxy is too complete to achieve complete bond between layers. If polymerization does occur between layers the surface must be roughened using a light abrasive that will not damage the fiber.
- f. After the last layer of fabric is installed a final layer of epoxy shall be applied with care to insure coating of all edges and seams.
- g. The individual supervising the installation of the fiber wrap shall be the same individual noted in the approved Information and Installation Manual. This individual shall be on site full time when fiber wrap is being installed. This individual shall not be removed or reassigned from the project without the written permission of the Engineer.
- h. The Contractor shall maintain a Wrapping Log. The Wrapping Log shall be available for review by the Engineer at all times, and upon completion of all wrapping the Engineer shall be given a copy. The log shall provide material traceability and records for the wrapping of each beam. As a minimum the Wrapping Log shall contain:
 - 1. Project name, contract number and bridge number.
 - 2. Material information including product description, date of manufacturer and lot or batch numbers and location that products are installed.
 - 3. Daily fabrication, inspection and verification data for the days construction. Include as a minimum the locations, composite thickness measurements, ambient temperature and humidity readings at the beginning, middle and end of each shift (or at the beginning and end of installation), documentation of any required curing process, thickness of any paint or protective coating applied, location of any damaged areas that are repaired.

Coating System Application

A final coating is required to protect the fibers from the elements, specifically UV radiation and to give the final aesthetic effect.

After 96 hours from final application of epoxy, if the final epoxy coat is completely polymerized, the exterior surface of the composite wrap shall be cleaned and roughened by a light abrasive. Care should be taken during the roughening process so that the fibers are not damaged. All cleaned and roughened surfaces shall be dry before painting.

The area to be painted shall receive a total dry film thickness of not less than 4 mils.

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Laboratory Testing

The Contractor shall prepare and furnish to the Authority one 12"x 12" sample of the cured composite system for each separate repair.

The Authority will randomly test the samples at their discretion and will furnish the Contractor results of all tests made. The Authority will precondition the samples at 140°F for 48 hours. Five 3/4"x 9" coupons will be cut from each sample and tested in accordance with ASTM D3039. Test results will include ultimate tensile strength, tensile modulus, and percent elongation.

If the average of the five coupons fails to meet the specified requirements, two additional coupons will be taken from the same sample. If the average of the seven samples also fails, the Authority will test the sample made prior to the failed sample and the sample made after the failed sample. This process will continue until the limits of the defective work are identified.

After the defective area is identified the Contractor shall reapply the entire composite system to the defective area.

Field Inspection

The Engineer will inspect the cured composite system for defects consisting of external abrasions or blemishes, delamination, voids, external cracks, chips, cuts, loose fibers, foreign inclusions, depressible raised areas or fabric wrinkles. The following repair criteria shall apply.

1. All defects greater than 1" long or a defective area greater than one square inch shall be repaired in accordance with the approved Information and Installation Manual.
2. If the number of defects of any size within an individual repair exceeds 10, the repair shall either be repaired or replaced as directed by the Engineer.

Method of Measurement

This work will be measured for payment in place and the area computed in square feet.

Basis Of Payment

This work will be paid for at the contract unit price per square foot for FIBER WRAP REPAIR.

Work to repair the surface prior to wrapping shall be paid for under pay items for PRECAST PRESTRESSED CONCRETE I-BEAM REPAIR.

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ACRYLIC COATING

Description. This item shall consist of surface preparation and painting of the repaired concrete surface of Precast Prestressed Concrete I-Beams and fiber wrap at the locations shown in the plans with an acrylic coating. The limits of the painting shall be as shown in the plans and as directed by the Engineer.

Materials. Acrylic Coating shall be an elastomeric, crack bridging, anti-carbonation, acrylic protective coating formulated for the protection of concrete. The Acrylic Coating shall have the following properties:

Color Gray	Munsell No. 5B 7/1
Solids Content	62% by weight, 55% by volume
Tensile Properties	(ASTM 0-412 modified after 21 days cure) Tensile Strength 200 psi Elongation at Break 625% at 730F Tensile Strength at 00F 1100 psi Elongation and Break 00F 225% Crack-Bridging (at 16 mils – 400 microns DFT) Static (at -4 degree F) 30 mils Dynamic > 1000 cycles (at -4 degree F) 12

mils Moisture Vapor Permeability (ASTM E-96) 14.5 Perms

Resistance to Wind Driven Rain (TT-C-555B) No passage of water through the coating.

Flame Spread and Smoke Development (ASTM E-84-94)
Flame Spread: 5
Smoke
Development: 5
Class Rating: A

Weathering (ASTM G-23) 10,000 hours. Excellent no chalking or cracking.

Construction Methods.

Surface Preparation. All surfaces to be coated must be dry, clean, sound, and frost free with curing compound residues and any other foreign matter removed. An open textured sandpaper like surface is ideal.

Added 2/22/2022

Where existing surface coating is present, the surface should be prepared by blast cleaning or high pressure water jetting.

All bare concrete areas should be primed with appropriate primer as recommended by the Acrylic Coating manufacturer. Ensure that primer is thoroughly dry before over coating to prevent formation of bubbles and blisters, particularly in warmer weather.

Application. Substrate must be dry before application. Moisture content of concrete surface shall be below 5%. Minimum age of concrete or concrete patch shall be 14 days prior to application.

Acrylic Coating shall be applied with brush or roller over entire area moving in one direction. A dry film thickness of 16mils should be achieved.

Method of Measurement. Application of Acrylic Coating shall be measured for payment in Square Yards for the surface area of the final coat applied.

Basis of Payment. This work will be paid for at the contract unit price per square yard for ACRYLIC COATING. Surface preparation and priming will not be paid separately but will be included in the cost of ACRYLIC COATING.

Added 2/22/2022