STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ADDENDUM NO. 2
for
INTERSTATE ROUTE H-1
AIRPORT VIADUCT IMPROVEMENTS
VICINITY OF VALKENBURGH STREET TO MIDDLE STREET, PH 2

FEDERAL-AID PROJECT NO. NH-H1-1(276)

NOVEMBER 19, 2020

This addendum shall make the following amendments to the Bid Documents:

A. SPECIFICATIONS

1. Replace Section 680 – SURFACE TREATMENT dated r11/06/20 with the attached Section 680 – SURFACE TREATMENT dated r11/18/20.

The following is provided for information:

A. CONTRACTOR'S RFI

Responses to Contractor's RFI are attached for your information.

B. SUBSTITUTIONS

Rapid Set Cement is denied as an alternative to FASTRAC 246 due to bonding issues and excessive heat generated during hydration which has caused cracking on previous projects.

Please acknowledge receipt of this Addendum No. 2 by recording the date of its receipt in the space provided on page P-4.

JADE T. BUTAY
Director of Transportation

Make the following Section a part of the Standard Specifications:

"SECTION 680 – SURFACE TREATMENT

680.01 Description. The work in this section describes applying surface treatment by spreading resin binder and aggregate on Portland cement concrete surfaces.

680.02 Materials.

(A) Resin Binder System. Provide a resin binder system, meeting the requirements of Table 1 below, recommended by the manufacturer as suitable for use on the intended pavement surface. A sample of the resin binder system for each lot/batch shall be supplied upon request.

Note: All materials shall be virgin; free of secondary components, volatile solvents, and external/conventional flexibilizers. Component batches shall be interchangeable.

Table 1

TWO COMPONENT RESIN BINDER REQUIREMENTS		
Property	**Requirement**	**Test Method**
Viscosity	10-30 Poise	ASTM D2556*[1]
Cure Rate (Set to Touch)	3 hours max	ASTM D1640*[2]
Shore D Durometer Hardness	60-80	ASTM D2240
Compressive Modulus	130,000 psi maximum	ASTM D695
Ultimate Tensile Strength	2,000-4,000 psi	ASTM D638*[3]
Elongation at Break Point	40%-70%	ASTM D638*[3]
Adhesive Strength (Bond to Concrete at 24 hrs)	250 psi min. or 100% concrete substrate failure	ASTM C1583*[4]
Thermal Compatibility	PASS	ASTM C884
Water Absorption	1% max	ASTM D570

*ASTM Material Properties Test Method Table Notes:

1. Mix test sample for 2 minutes. Test at a temperature of 73 ± 1°F.
2. Prepare specimens of 50-55 wet mil thickness.
3. Prepare Type I specimens.
4. Follow manufacturer's recommendation for curing before testing.

- A test report* consisting of a certification by an *AASHTO resource/CCRL* accredited independent testing laboratory showing compliance with the requirements of this specification and material properties. Include the accredited laboratory's test results with the certification.
- Product data sheets and specifications from the manufacturer showing instructions, application recommendations and methods, product properties.

*Dated within 90 days of contract award.

Table 2

WORKING TIME	
Surface Temperature (ºF)	**Maximum Working Time* (minutes)**
50	45
60	35
70	20
80	11
90	9
100	7
110	6
120	4

*Includes mix time, resin binder and aggregate placement.
Note: Consult manufacturer for surface temperatures exceeding 120ºF.

(B) **Aggregate.** Furnish aggregate meeting the requirements listed in tables below unless otherwise specified by the Engineer. Deliver the aggregate to the construction site in bags or super sacks labeled clearly for identification. Provide aggregate that is virgin, clean, dry, and free from foreign matter. A sample of the aggregate lot/batch shall be supplied upon request.

(C)

Table 3

Test Data Description	Test Procedure	Testing Lab. Requirements
Gradation	ASTM C136	See Table 4
Moisture	ASTM C566	NCAT 0.0%
MOHS Hardness	MOHS Scale	Krazen & Associates 7.1
Micro-Deval	AASHTO T327	ODOT 2.6%
Absorption	ASTM C127	NCAT 1.0%

Table 4

Armorstone	980-3 - #4 x #16
Sieve size	Percentage passing
No. 4	100
No. 8	30-75
No. 16	0-5

680.03 Construction Requirements.

(A) Submittal Requirements. Prior to the start of this work, provide six copies of the following submittals in one complete set for acceptance. Indicate clearly the name of the product and its manufacturer on pertinent submittals. No work that is related to these submittals shall be performed until written acceptance has been received.

(1) The name and contact information of the resin binder and aggregate manufacturer's technical representative and other key personnel.

(2) A warranty on the products provided by the epoxy binder manufacturer. Warranty shall be for a minimum of 10 years.

(B) Quality Control (QC) Plan. Submit a QC Plan to the Engineer for acceptance a minimum of 30 days prior to the installation and the Just-In-Time Training (JITT). Resubmittal of the document will require another 30 days for each resubmittal. Discuss the QC Plan requirements at the JITT, pre-construction, pre-installation, and progress meetings. The JITT shall not be held unless the QC Plan is accepted 30 days before the scheduled JITT date. Work shall not start on the surface treatment, including the test application, until the JITT has been completed and the QC Plan and the Work Plan have both been accepted. The QC Plan shall contain at a minimum the following information:

(1) Names and contact information for key personnel, project superintendent, and lead technician responsible for field quality control sampling and testing.

(2) Location of resin binder production plants and batch production records.

(3) Location of aggregate production plants and batch production records.

(4) Proposed method of installation at each location identified to receive surfacing.

(5) Resin binder and aggregate manufacturer's material information including:

(a) Recommended placement instructions.

(b) Mixing instructions.

(c) Recommended installation temperatures.

(d) Anticipated gel and cure times at various expected ambient temperatures for all sites.

(e) Methods of safe storage and handling.

(f) Applicable installation and material limitations.

(g) Disposable methods for excess mixed resin binder and associated components.

(h) Production plant location contact information for the quality control/quality assurance (QC/QA) personnel where additional information can be requested concerning record keeping methods, inspection methods, equipment calibration records, and accreditation certificates.

The QC Plan shall designate a QC Manager, who shall be present at the jobsite and have full authority to request any action necessary for the operation of the QC Plan providing it complies with the contract documents and acceptance of the Engineer.

The QC Manager shall be certified in all test methods used and be responsible for the required field quality control in sampling and testing in conformance with the accepted quality control plan, test methods and contract documents. All sampling shall be performed in the presence of and with no direction by the Engineer. The Engineer is not responsible or shall be regarded as part of the contractor's QC team. It is the responsibility of the contractor and the QC Manager to ensure that the test procedure being used is compliant with the test method standard. Inspections are performed for the exclusive benefit of the State. The inspection of or the failure to inspect the work shall not relieve the Contractor of obligations to fulfill the contract as prescribed, to correct defective work, and to replace unsuitable or rejected materials regardless of whether payment for such work has been made. The Engineer has the right to reject the test if the Engineer feels that it is non-compliant, e.g., the technician who performed the test is not certified or the material testing laboratory is not accredited to perform the required tests. The Engineer is under no obligation to correct or direct non-compliant procedures if observed. Maintain and have available upon request, the current test standard methods documentation being used, referenced documents, complete records of sampling, testing, corrective actions, and quality control inspection results.

A technical representative from the resin binder manufacturer shall be present at the JITT, Test Application, e.g., deck repair, surface preparation, installation and acceptance of the surface treatment, and at the construction

site for the first two days of the surfacing treatment installation.

(C) Work Plan. Submit a Work Plan to the Engineer for approval 14 days prior to the installation. Discuss the Work Plan requirements at the pre-construction, pre-installation, and progress meetings. The Work Plan shall contain at a minimum the following information:

(1) Method of surface preparation and required surface condition for adequate bonding.

(2) Method of crack repair/defective concrete repair of existing concrete deck.

(3) Construction during inclement weather, Plan for the occurrence of rain, moisture and temperature requirements for the materials being used.

(4) Mixing ratio and application rates for resin binder and aggregate.

(5) Application Method.

(6) Curing time and requirements for opening to traffic.

(7) Corrective actions that will be taken for unsatisfactory installation practices.

(D) Just-In-Time-Training. JITT shall be held and shall conform to Section 695 – JUST IN TIME TRAINING.

(E) Surface Preparation. Surface preparation for concrete decks with a penetrating sealer and aggregate topping overlay shall conform to the following requirements:

(1) Sweep the surface clean with a vacuum sweeper.

(2) Blow the surface clean using oil-free air to remove dust, laitance, and other deleterious material that may affect the bonding of the surface treatment from the surface.

(3) All laitance, contaminants, paint, markers and foreign material that may inhibit the bond of the surface treatment, shall be removed from the surface before sweeping with vacuum sweeper.

(4) If the prepared surface is contaminated prior to installing the surface treatment, abrasive blast, sweep and blow the surface clean.

⚠2 Surface preparation for existing steel from expansion joints shall not be shotblasted. Contractor shall follow manufacturer's recommendations during surface preparation of all joints.

(F) Test Application. The test application shall be a part of the production location before starting production work. Resin binder manufacturer's representative shall be present during the test application. The test application shall meet the following requirements:

(1) Install a minimum of 200 square yards.

(2) Shall be constructed using the same method and equipment as the production work.

(3) Shall construct an additional test application for each method proposed for the production work.

(4) Shall replicate field conditions, including ambient and surface temperatures, time period, anticipated for production work.

(5) Shall demonstrate surface preparation method as outlined in the QC plan.

(6) Shall demonstrate that the data management system is capable of documenting ambient and surface temperatures, quantities of resin binder and aggregate, coverage rates and reporting application rates in real time.

(7) Determine the initial set time for the resin binder.

(G) Surface Application. The following information is required in a real time reporting method:

(1) The volume of mixed resin binder per square yard being applied.

(2) The mixed resin binder mil thickness on average throughout the application width per square yard.

(3) The volume of aggregate applied throughout the application width per square yard.

(4) The ambient and pavement surface temperature during the application period.

⚠1 Apply the blended resin binder on the pavement surface plane in a uniform application with a minimum thickness of 60 mils. Verify thickness using a Wet-Mil film thickness gauge every 75-100 lineal feet of application and by comparing theoretical quantity to actual quantity of epoxy placed using table 5. Ensure the surfacing aggregate is applied uniformly at a rate of 14-17 pounds per square yard within the working time per Table 2.

Table 5

METHOD OF CALCULATION	
Mil Thickness	**Square Foot per Gallon**
60	26.73

(H) Application Method. Expansion joints, drains and grates shall be adequately isolated to prevent any surface treatment from entering drainage and joint systems. The surface treatment discharged from the mixer shall be uniform in composition and consistency. Mixing capability shall be such that initial and final finishing operations can proceed at a steady pace.

Continuous application must be performed by approved, calibrated, self-propelled application equipment capable of continuously and thoroughly blending the resin binder components to the ratio recommended by the manufacturer. The continuous application equipment shall have an aggregate distribution system capable of mechanically placing aggregate from a maximum height of 12" into the wet resin binder evenly across the full width of the installation. The application equipment shall be capable of containing enough resin binder and aggregate to install a minimum of 2000 square yards of surfacing. The application equipment must have an independent recirculating heating system capable of heating the resin binder to a minimum of 95°F.The application equipment shall install the surfacing at a minimum application rate of 20 linear ft per minute. Perform a final sweep of loose aggregates and debris from the areas adjacent to the applied surface treatment within end of work shift. Ensure all expansion joints are free of loose aggregate, epoxy and other debris.

For small, odd shaped areas inaccessible to the continuous applicator truck, mixed epoxy is dispensed from the truck by hand through a mixing wand onto the area to be treated. Contractor shall use a notched squeegee to evenly spread the epoxy according to the manufacturer's recommendations. Broadcast aggregate by hand onto the wet epoxy until rejection and epoxy surface is completely covered with aggregate.

(I) Curing. Traffic and construction equipment shall not be permitted on the completed surface treatment overlay for 2 hours or until the surface treatment is tack free whichever is later.

(J) Acceptance and Corrective Action. The completed surface treatment shall be free of any smooth or wet areas such as those resulting from insufficient quantities of topping aggregate. Completed overlay surface must be uniform in thickness, texture and appearance.

At the discretion of the Engineer, Tensile Bond testing shall be performed for each placement per day. Testing may be conducted on a separate concrete substrate representing the field conditions upon approval of the Engineer. Testing will be performed in accordance with ASTM C 1583 and the manufacturer's recommendations. A passing test is the failure of the concrete substrate or bond strength above 250 psi at 24 hours. Fill cored holes with approved material specified in Section 682 – Defective Concrete Repairs.

Correct all defects in material and work, as directed, at no additional cost to the Engineer, according to the following:

(1) Remove and replace surfacing treatment that the Engineer determines has any raveling, delamination, streaking, or bond test failure.

(2) Replace with acceptable surfacing treatment at the installer's expense. Ensure the minimum replacement is the full lane width and the length of the defect plus five lane feet on the up-station and down-station side of the edge of the defect area and as accepted by the engineer. Replaced areas will be retested and evaluated for acceptance or further corrective action.

(3) Any roadway features disturbed by the work or the installer's operations shall be restored with the same materials and design as directed by the Engineer at no additional cost to the agency.

680.04 Measurement. Surface Treatment will be measured per square foot as shown on the plans or as specified in the proposal.

680.05 Payment. The Engineer will pay for accepted quantities of Surface Treatment at a contract unit price, per square foot for the pay item listed below, which appears in the proposal. Payment for JITT shall be considered as incidental for this section.

⚠1 Payment will be full compensation for furnishing and placing all materials, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

No separate or additional payment will be made for preparing road surface, placing materials in final position, sweeping or for the minimum testing of the

materials and placement as defined in this specification.

No separate or additional payment will be made for reinstallation and retesting of surface treatment where the initial installation was determined to be defective.

Payment will be made under:

Pay Item	**Pay Unit**
Surface Treatment _____	Square Foot"

END OF SECTION 680

Contractor's RFI:

1. Per Specification Section 682.03(B)(G)- Early Strength Monitoring, the contractor is required to install maturity meters in the repair areas to confirm the early strength requirements. Please confirm that shall the depth of repair areas not be suitable for installation of maturity meters that alternative conformance testing will be acceptable.

   Alternate methods for early strength monitoring are acceptable in areas where maturity meters are not practical.

2. Per specification section 682.03(B) - Non-Destructive Testing (NDT) Deck Survey, the NDT deck survey shall be completed prior to any repair work on the bridge deck. Due to the NDT testing being reimbursed on Force Account basis and the results of the NDT survey determining the actual amount of deck repair areas for this project, Please confirm that the official construction NTP will issued following HDOT evaluation of the NDT study.

   The contractor is expected to start on the repairs as shown, additional areas as determined by the NDT will be provided as they become available.

3. Please advise if a standard qualification questionnaire, per HRS Chapter 103D-310, is required to be submitted with the proposal documentation.

   A standard qualification questionnaire is not required.

4. Please confirm that any strengthening, surface preparation, welding, or replacement of reinforcing steel will be considered incidental to Bid Item 602.1000 - Reinforcing Steel for Defective Concrete.

   Yes, provided that the strengthening and surface preparation is for the reinforcing steel only.

5. Please confirm that shall the contractor provide supporting documentation that Defective Concrete Repair work was constructed per the contract requirements and manufacturers recommendation, any repair or replacement costs associated with Specification Section 682.03(I)(7)9d) - In Place Test of Repairs will be reimbursed to the contractor on a time and material basis.

   Yes.

6. Please confirm that the state representative or project Engineer will be responsible for layout and determination of defective concrete repair areas & Joint replacement locations per the results of the NDT study and the contract plans.

   Yes.

7. Please advise of any extended manufacturer warranties required for this project.

   See Addendum 1.

8. Plan sheet N-2 Public Health, Safety and Convenience Note 2-Will the noise variance permit that the State is pursuing cover this requirement?

   Yes.

9. Plan sheet S0.2 3. Reinforcement note A. In most repair areas the existing reinforcing steel is less than the specified 1 ½" minimum clearance specified. What is the intended procedure to adjust the reinforcing clearance within the repair and along the edges of the repairs? Please provide details.

   Should the condition that is referenced be encountered, Item 602.1000 shall be used to address the issue.

10. Plan sheet S0.2 3. General Construction Notes-G. If the existing concrete is delaminated or otherwise defective below the 50% deck thickness can the contractor stop the repair at that elevation? If not please provide additional bid line item for full deck repairs since the cost is considerably more than partial depth repairs.

    Item 682.1000 shall be used to quantify the repairs. Please refer to the special provisions Section 682 – Defective Concrete Repairs.

11. Plan sheet S4.1-It appears these are not part of bid item 515.1000. Please provided estimated quantity for existing expansion joint compression seals to be replaced along with existing estimated widths to determine accurate cost.

    The quantity is as shown on the proposal, see Addendum 1.

12. Proposal Schedule-Item No. 682.1000-Please clearly describe how depth of repairs will be quantified in the field. Recommend changing this line to square footage which is more accurate way of quantifying repair areas.

    Field measurements will be taken of each repair area for quantification.

13. Please confirm that item no. 682.1100 will be utilized to pay for locating existing repair locations shown on the contract drawings.

    The State or their duly authorized representative will provide the limits of repair.

14. Paragraph 678.03 (N) Surface Testing (3) Tensile Bond Strength Last sentence requires The minimum acceptable tensile bond strength is the failure of the concrete substrate or bond strength about 250 psi at 24 hrs. The tensile strength of the existing concrete substrate cannot be relied on for a pass or failed test. Recommend changing pass fail criteria to include amount of failure at bond line.

    Specification will not be changed. Should the surface be not suitable for a bond strength of 250 psi, it will be removed and replaced.

15. Section 680.05 Table 5 indicates 26.73 square feet per gallon as payment. Does this account for the existing tined surface profile of the concrete deck?

    Yes.

16. Section 683.02 Materials. On a previous project it required the entire deck to be sealed. Was the sealer used compatible with the specified sealer for this project?

    Not sure what project or material compatibility is referenced but the entire surface needs to be shotblasted so any existing surface sealer will be removed.

17. As the subject project got extended for 2 weeks via Addendum 1, please advise if the RFI deadline has also been extended as we have a few RFIs that we'd like to submit.

    The RFI deadline is extended to Nov 17, 2020.

18. Our supplier for the compression seals item 515.1000 has requested if you have the information for expected width for expansion and/or contraction at joints requiring new seals (i.e. the required 1.25" compression seals)? Please advise.

    Joint widths may vary across the entire project due to various joint types. Contractor needs to field verify the widths of each defective joint to determine the correct sizing. See joint detail notes on plans.

19. Per Addendum 1 Sheet S5.1 Note 5 the surface treatment is required to be placed within 48 hours of the penetrating sealer. This is not reflected in specification section 680 or 683. Please confirm this requirement.

    Yes, it is noted on the construction sequence in the plans.

20. Per Addendum 1 Sheet S5.1 Note 5 the surface treatment is required to be placed within 48 hours of the penetrating sealer. Please advise on the required construction process shall the period extend past 48 hours.

    Please see Special Provisions Section 680 - Surface Treatment.

21. Please confirm the roadway must be shotblasted within 48 hours prior to placement of surface sealer.

    Yes.