**STATE OF HAWAII**
**DEPARTMENT OF TRANSPORTATION**
**HIGHWAYS DIVISION**

**ADDENDUM NO. 2**
**for**
**KAMEHAMEHA HIGHWAY SAFETY IMPROVEMENTS**
**WAIKANE VALLEY ROAD TO VICINITY OF KAHEKILI HIGHWAY**
**PROJECT NO. HSIP-083-1(66)**

The following amendments shall be made to the Bid Documents:

## A. TABLE OF CONTENTS

1. Replace Table of Contents dated 10/9/18 with attached Table of Contents dated r11/2/18. Section 421 High Friction Surface Treatment page numbers revised.

## B. SPECIFICATIONS

1. Replace Special Provisions Section 421 pages 421-1a to 421-5a dated 7/20/18 with attached pages 421-1a to 421-6a dated r10/31/18.

## C. PROPOSAL

1. Replace Proposal Schedule pages P-8 dated 10/1/18 with the attached pages P-8 dated r10/31/18. Duplicate bid item "626.3000 Adjusting Water Valve Box and Frame Cover" was removed.

## D. PLANS

Replace Plan Sheet Nos. 3, 10, 11, 12, 13, 15, and 16 with the attached Plan Sheet Nos. ADD. 3, ADD. 3, ADD. 10, ADD. 11, ADD. 12, ADD. 13, ADD. 15, and ADD. 16.

The following is provided for information.

## E. PRE-BID MEETING MINUTES

1. Meeting minutes are attached for information and shall include a list of attendees.

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

for JADE T. BUTAY
Director of Transportation

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Make the following Section a part of the Standard Specifications:

## "SECTION 421 – HIGH FRICTION SURFACE TREATMENT

**421.01 Description.** This section describes furnishing and applying a high friction surface treatment (HFST) system on a prepared surface as specified and in conformity with the lines and details shown on the plans.

**421.02 Materials.**

**(A) General.** Use a two-part modified exothermic epoxy or polymer resin binder treatment containing epoxy or polymer binder capable of retaining a bauxite aggregate topping under vehicle conditions. Reference to epoxy binder herein refer also to polymer binder unless otherwise specified.

**(B) Epoxy or Polymer Binder:** The epoxy binder shall consist of a thermosetting modified epoxy compound which holds the aggregate firmly in position. The epoxy binder shall meet the requirements in TABLE 421.02-1 EPOXY OR POLYMER BINDER REQUIREMENTS .

**TABLE 421.02-1 EPOXY OR POLYMER BINDER**

| Property | Requirements | Test Method |
|---|---|---|
| Ultimate Tensile Strength | 2,500 psi min. | ASTM D638 |
| Compressive Strength | 1,600 psi min. | ASTM D695 |
| Gel Time | 10 minutes min. | ASTM D2471 |
| Water Absorption | Less than 0.50% | ASTM D570 |
| Shore Hardness | 65 min. | ASTM D2240 |
| Viscosity | 3,000 CPs Max | ISO 2555 |
| Cure Rate | 3 hours max. | Thin Film @ 75 °F |
| Mixing Ratio | * | n/a |

*As recommended by the Manufacturer

Two-part epoxy materials which are not exothermic in curing and do not meet the viscosity requirements will not be allowed. Independent laboratory report documents shall be current, not older than 12 months old, and shall provide documentation that the epoxy binder meets the requirements in this section.

**(C) Aggregate Topping:** The aggregate topping shall be a calcined bauxite consisting of a 1-3mm gradation. The aggregate will be delivered to the construction site in plastic wrapped bags or super sacks, with Manufacturer's information clearly labeled . Wrapping shall protect from moisture and contamination to maintain aggregates clean, dry, and free

from foreign matter. The aggregate shall meet the requirements in TABLE 421.02-2 AGGREGATE REQUIREMENTS .

| TABLE 421.02-2 AGGREGATE REQUIREMENTS | | |
|---|---|---|
| **Property** | **Requirement** | **Test Methods** |
| Aggregate Abrasion Value | 10% max. | LA Abrasion Test |
| Moisture Content | 0.2% max. | AASHTO T255 |
| Aluminum Oxide | 87% min. | ASTM C25 |
| | **Sieve Designation** | **Requirement** |
| Aggregate Gradation | No. 6 Sieve Size | 95 % min. Passing |
| | No. 16 Sieve Size | 5% max. Passing |

**(D) Certification.** Submit certification from the manufacturer that the aggregate meets the above requirements. Submit documentation of the in-place friction characteristics (minimum 65 FN40R in accordance with ASTM E274) of aggregate bonded to a vehicular bearing surface using the modified epoxy binder . Submit a list of projects with owner contact information on which a minimum of 3,000 square yards of HFST has been placed within the past three years. Records shall show binder, equipment and operator shall be the same as applied in those years as well as it being the same for this project.

**(E) Storage of material.** Materials shall be stored in accordance to the manufacturer's recommendations.

Safety Data Sheet (SDS), Product Data Sheet, and other information pertaining to the safe practices for the storage, handling, and disposal of the materials, and to their health hazards shall be obtained from the manufacturer and posted at storage areas and shall be submitted to the Engineer.

## 421.03 Construction.

**(A) General:** The manufacturer's employed representative shall come to the construction site to train HDOT, Construction Manager, and Contractor personnel prior to surface treatment and shall be present during preparation and application for the first full location. Treatment of cracks and protection of working joints and cracks shall be included.

Do not apply the two part modified epoxy binder on wet surfaces, when the ambient and/or surface temperature is below 40 °F or above 105° F, or when the anticipated weather conditions would prevent the proper application of the surface treatment as determined by the manufacturer's representative. Conditions include rain within 6 hours of application, or is forecast over 40%. Recommend waiting at least 24 hours after rain before application.

**(B) Preparation.** Surfaces shall be clean, dry and free of all dust, oil,

debris, tar, prior crack treatment etc. and any other material that might interfere with the bond between the epoxy binder material and existing surface.

Clean the surfaces by using compressed air (185 cfm min), broom or vacuum to remove all dust and other loose material. Grind any remaining concerned areas. Perform a final blowdown using 185 cfm compressed air. Adequate cleaning of all surfaces will be determined by the manufacturer's employed representative and the Engineer.

Protect utilities, drainage structures, curbs, joints and any other structure within or adjacent to the treatment location against the application of the surface treatment materials.

Remove by grinding all pavement markings that conflict with the surface application and clean with high pressure, broom or vacuum the surface clean followed by a final blowdown using 185 cfm compressed air prior to the epoxy binder application.

Pre-treat joints and cracks, other than Portland cement concrete working joints, as determined by the Engineer greater than 1/4 inches in width and depth with the mixed epoxy specified herein. Treatment of joints and cracks shall be in accordance with the manufacturer's employed representative.

Once the epoxy in the pre-treated areas has gelled, the high friction epoxy binder and aggregate topping installation may proceed. Be attentive to long runs, and gelling can occur faster with warmer temperatures.

For application on new underlying and adjacent asphalt pavements, install the high friction epoxy binder and aggregate topping a minimum of 30 days after the placement to reduce the likelihood of tracking.

**(C) Mixing and Application of Epoxy Binder and Aggregate Wearing Surface.** Utilize one of the following methods for application of the epoxy binder and aggregate wearing course, as applicable.

**1. Hand mixing and application.** Proportion the two-part modified epoxy base binder components, Part A and Part B to the correct ratio as recommended by the Manufacturer and mix using a low speed, high torque drill fitted with a helical stirrer. The stirrer shall be a Jiffy Mixer or an exact equivalent. Refer to jiffymixer.com for local distributors. Use this method for low volume application areas, such as intersections, areas less than 250 square yards, or where truck mounted machines are not applicable to the specified locations because of logistical restrictions. Manually apply the mixed components onto the prepared pavement surface at a thickness of 60 mil +/- 5 mils Uniformly spread the hand

applied base binder onto the substrate. Immediately, spread the high friction surfacing aggregate onto the two part modified epoxy binder, at a minimum rate of 13 lbs/sy and at a saturation state where no wet spots appear. Ensure leveling of HFST liquid is not disturbed. Check thickness of HFST liquid using a mil gauge.

**2. Mechanical mixing and application.** Apply the two part modified epoxy base binder by a truck mounted application machine onto the pavement section to be treated across the entire lane width and at a uniform application thickness. Proceed with operations in such a manner that will not allow the epoxy base binder material to separate in the mixing lines, cure, dry, or otherwise impair retention bonding of the high friction surfacing aggregate. Apply the mixed components mechanically onto the prepared pavement surface with a uniform thickness of 60 mil +/- 5 mils onto the pavement surface. Immediately, spread the high friction surfacing aggregate onto the installed two part modified epoxy binder, at a minimum rate of 13 lbs/sy coverage and until saturation such that no wet spots appear. The high friction surfacing aggregate should be mechanically applied across the full lane width in a uniform continuous application within 2 minutes of binder being applied and at a saturation state where no wet spots appear. Aggregate application shall cover the entire area of the epoxy binder application without disturbing the leveling of HFST liquid. Check thickness of HFST liquid using a mil gauge.

**3. For either method hand or mechanical** , Do not compact aggregate after placement. Completely cover the wet epoxy binder with aggregate to achieve a uniform surface. No exposed wet spots shall be visible once the aggregate is placed. If wet spots are present it is an indicator of insufficient aggregate being applied, add more aggregate to the wet spot immediately upon discovery.

Check thickness of epoxy base binder every 75 linear feet using a mil gauge.

**(D) Curing.** Allow the binder topped with high friction to cure in accordance with the manufacturer recommendations. Refer to Manufacturer's data/charts for cure times vs temperature. Protect treated surfaces from traffic and environmental effects until the area has cured.

Once cured, remove excess aggregate by broom, mechanical sweeping, or vacuum followed by compressed air (minimum 185 cfm compressor) before opening to traffic. Excess aggregate can be reused for one reuse time only, provided the aggregate is kept clean, dry and free from contaminates. Remove and dispose excess aggregate from project site.

The Engineer may require additional mechanical or vacuum

sweeping as necessary after the system fully cures and the treated surface is open to traffic. Broom or vacuum immediately before opening to traffic and a final sweep 7 to 14 days after opening.

**(E) Pavement Markings.** All pavement markings shall be at the height specified in the Contract Documents measured from the HFST surface.

**(F) Additional Signs.** Install traffic warning signage "Loose Gravel", or "Motorcycles Use Caution" or both should conditions require the warning.

**(G) Test Strip.** At a location chosen by the Engineer install a test strip of the HFST. The test strip shall be done before production installation of the HFST is started. The manufacturer's employed representative shall be present at the installation of the test strip. The test strip shall use all the personnel, material, equipment, i.e., means and methods the Contractor intends to use during the production of the HFST. The test strip shall demonstrate the Contractor's ability to do HFST work that meets the requirements of the Contract Documents. The Engineer may reject the test strip or accept it with comments or accept it. Adjust means and methods to address the engineer's comments, or if considered extra work requiring a contract change order and additional cost or contract time or both inform the Engineer in writing.

`Construct a test strip of 50 linear feet long by one lane width of the lanes within the project area. The test strip shall to demonstrate the hand or mechanical application method or both if both application method is to be used. In those cases, two test strips shall be constructed. When a mechanical method is used check that the machine has been properly calibrated. Verify application rates and cure time. No HFST production installation shall take place until an acceptable test strip for the method used is installed. The test strip will be part of the HFST quantity of the project when accepted by the Engineer. If the test strip is not found acceptable remove and restore test strip area this shall be at the Contractor's cost and no additional contract time will be given. Redo the test strip until it is acceptable to the Engineer.

**421.04 Measurement.** The quantities to be paid for will be the plan quantity, in square yards, completed and accepted. No deduction will be made for the areas occupied by manholes, inlets, drainage structures, pavement markings or by any public utility appurtenances within the area.

**421.05 Payment.** The Engineer will pay for the accepted high friction surface treatment at the contract price per square yard as shown on the proposal schedule. All work will be full compensation for the work prescribed in this section and the contract documents.

The Engineer will pay for the following pay item when included in proposal

schedule:

| Pay Item | Pay Unit |
|---|---|
| High Friction Surface Treatment (with Modified Epoxy or Polymer Binder or Equivalent) | Square Yard" |

**END OF SECTION 421**

## PROPOSAL SCHEDULE

| ITEM NO. | ITEM | APPROX. QUANTITY | UNIT | UNIT PRICE | AMOUNT |
|---|---|---|---|---|---|
| 203.1000 | Roadway Excavation | 70 | C.Y. | $ | $ |
| 209.1000. | Installation, Maintenance, Monitoring & Removal of BMP | L.S. | L.S. | L.S. | $ |
| 209.2000 | Additional Water Pollution, Dust, and Erosion Control | F.A. | F.A. | F.A. | $ 40,000.00 |
| 401.1000 | HMA Pavement, Mix No. IV | 2,300 | TON | $ | $ |
| 415.1000 | Cold Planing | 11,000 | S.Y. | $ | $ |
| 416.1000 | Paving Grid, GlasGrid 8512TF or Equivalent | 4,000 | S.Y. | $ | $ |
| 421.1000 | High Friction Surface Treatment (with Modified Epoxy or Polymer Binder or Equivalent) | 11,000 | S.Y. | $ | $ |
| 603.9000 | Clean Existing Culverts | F.A. | F.A. | F.A. | $ 30,000.00 |
| 615.0110 | 16-Inch Milled Rumble Strip, Centerline | 14,740 | L.F. | $ | $ |
| 626.1000 | Adjusting Water Manhole Frame and Cover | 9 | EA | $ | $ |
| 626.2000 | Adjusting Water Meter Frame and Cover | 1 | EA | $ | $ |
| 626.3000 | Adjusting Water Valve Box Frame and Cover | 4 | EA | $ | $ |

# KAMEHAMEHA HIGHWAY SAFETY IMPROVEMENTS
# WAIKANE VALLEY ROAD TO VICINITY OF KAHEKILI HIGHWAY
# PROJECT NO. HSIP-083-1(66)

## PRE-BID MEETING MINUTES
## October 22, 2018

The following are minutes for the Hawaii Department of Transportation (HDOT) pre-bid meeting with prospective bidders for the project Kamehameha Highway Safety Improvements Waikane Valley Road to Vicinity of Kahekili Highway.

The meeting was held at the State Office Building (601 Kamokila Blvd) in Kapolei at 1:00 pm. Bryan Lum conducted the meeting.

A sign-in sheet with the names of the attendees is attached.

Bryan L. pointed out the following project related items at the start of the meeting:

1. Addendum No. 1 was submitted on 10/18/18 and will be issued shortly. The addendum changes the request for information (RFI) deadline to close of business (COB) Thursday Oct. 25, 2018. All RFI's shall be received in writing by email. No calls will be accepted. Questions received after the deadline will not be addressed.
2. High friction surface treatment (HFST) will be installed in both the lanes and the shoulders as shown in the Typical Sections. This also includes bus pullouts. On the Roadway Plans, the callouts state install HFST "within the travel way." This is not correct and will be amended.
3. On P-8 there is a duplicate pay item for "626.3000 Adjusting Water Valve Box Frame and Cover (4 EA)." There is only one entry for this pay item.
4. The work for the Pulama Rd Shoulder Widening Detail on Plan Sheet 10 is shown in the inset on Plan Sheet 15 from BL Sta. 469+50 to BL Sta. 469+64. The shoulder widening detail also states "3.25' of grass". It should be labeled "existing grass" and no additional grass is needed for the project.
5. For "widen shoulder at crosswalk" callouts on the Roadway Plans, the plans will be amended to show that the widening extends past the existing ES. It currently shows it is within the paving limits.
6. The shoulder widening will not be subject for loading. Subbase, aggregates, or ASB will not be needed for this project.

**Questions:**

1. Will HFST be installed on the bus pullouts?

   *Yes, HFST will be installed on bus pullouts.*

2. General Notes, Plan Sheet 3 - Note #7. Night time working hours are not in Section 107 of the Special Provisions. Please verify night time working hours.

   *No night time working hours for this project.*

3. When do you expect this project to start? Month & year?

   *Project bid opening is Nov. 15, 2018. Based on that, the estimated NTP is February 2019.*

4. Is a rolling lane closure be allowed? If so, can a rolling lane closure along a 2000 L.F. stretch be allowed? Can it be amended to 2000 L.F.?

   *A rolling (mobile/moving) lane closure is allowed because they been used on other projects. Special Provisions Section 645 allows a 1000 L.F. lane closure. That parameter must be followed. The lane closure length in the spec will not be revised. Special Provisions Section 645 Lines 26-27 stipulate "Exceptions to lane closure hours and lengths specified require written acceptance by the Engineer." The District can work with the contractor regarding lane closures based on field conditions.*

5. Section 645 (F) – There is one pavement repair location that is 1,525' long (Sta. 528+75 to Sta. 544+00), will the State allow this work to be done in one lane closure? The specs limit lane closures to 1,000 L.F.

   *Special Provision Section 645 calls out a 1000 L.F. lane closure. The lane closure length in the spec will not be revised. Special Provisions Section 645 Lines 26-27 stipulate "Exceptions to lane closure hours and lengths specified require written acceptance by the Engineer." The District can work with the contractor regarding lane closures based on field conditions.*

6. What is the RFI deadline?

   *COB Oct. 25, 2018.*

7. What projects has HFST been used on? If so, who has done it? We know of no contractors that have done it here. Can the contact information or contractor information be provided for those who have HFST experience so that we can get quotes from them for HFST work and getting the aggregate? We're trying to figure out who has done HFST, so contractors can get quotes to get the work done. A contractor has to be able to do the work, before it is spec'd out.

   *HFST has been applied two times on the Makakilo Dr. on ramp to H-1 eastbound and Aiea Loop Ramp by Haron Construction Inc. A few curves were done on Tantalus or Round Top Dr. under the City and Count (C&C) of Honolulu by a striping company. The C&C was not satisfied although it may have been intended for another application. The binder system for the HFST for these areas were all Tyre Grip systems.*

   *Pali Hwy Resurfacing Waokanaka St. to Kam Hwy Project No. NH-061-1(35) (bid FY2017) has HFST as part of the scope of work, but it has not been installed on the job yet. The bidders list and project information are available on the HDOT website for Pali Hwy Resurfacing. The bidders list for the project is available here: https://hidot.hawaii.gov/administration/files/2016/07/NH-061-1035.pdf. Current project information is available on the HDOT HWYs website. Go to http://hidot.hawaii.gov/highways/ and select "Project Map" from the "Major Projects" drop down menu. Select the project on the map and information including scope and resident engineer contact information are available.*

8. Special Provisions Section 421 421.02D Certification states "Submit a list of projects with owner contact information on which a minimum of 3,000 square yards of HFST has been placed within the past two years. Records shall show binder, equipment and operator shall be the same as applied in those years." How can contractors provide this certification and proof if no contractor in the State of Hawaii has experience installing HFST?

   *The intent is to have a quality product by using materials that meet specifications backed up by the Manufacturer with recent experience. The last sentence of Section 421 421.02D Lines 43-44, "Records shall show binder, equipment and operator shall be the same as applied in those years.", does not necessarily mean to use the same binder, equipment, and operator on this project, but their records only. The HFST Manufacturer for the Pali Hwy Resurfacing project intends to bring in a subcontractor and manufacturer's representative.*

9. Was HFST dollar amount used in the calculation of the DBE goal? How can it be used in the DBE calculation if no subcontractors have done the work here?

   *HFST was not used in the calculation of the DBE goal.*

10. How is the DBE goal calculated?

    *HDOT cannot provide that information on how the DBE goal is calculated.*

11. For this job we can cold plane and pave, but we must wait 30 days before installing HFST on top the pavement. Was the 30 day waiting period for installing HFST on new pavement (stated in Special Provisions Section 421.03B Lines 92-94) considered in the contract time? There is going to be a gap in time between paving and HFST installation.

    *Yes, the 30 day waiting period was accounted for in the contract time.*

The meeting ended at 1:25 pm.

**Email Questions:**

1. Plan Sheet 3 – General Notes Note #7. Note is misleading. It reads that there will be only night work, but no night work hours are specified in Section 107 of the Special Provisions. Please clarify.

   *No night work for this project. Note #7 has been removed from General Notes.*

2. Section 421- Since this is new to Hawaii, which specialty contractor's license covers the High Friction Surface Treatment?

   *Specialty license C-3 or C-3a covers HFST.*

3. Which scopes of work were used to determine the DBE goal?

   *Transportation of materials and pavement marking & striping.*

4. Will the State consider changing item 421.1000- High Friction Surface Treatment (with Modified Epoxy Binder) to be a force account item?

   *HFST will remain as unit quantity.*

5. The allowable lane closure hours shown on specification page 645-1a do not seem to correspond with the allowable lane closure hours shown on Plan Sheet #3, General Notes, Bullet 7. Which is correct?

   *The allowable lane closure hours in Special Provisions Section 645 is correct. General Note #7 was removed.*

6. The HFST note on the Roadway Plans states it must be installed "within travel way" which are the lanes. However, the typical sections on Plan Sheet 8 & 9 shows full installation across the lanes and the shoulders within in the paving limit. Please clarify.

   *HFST will be installed in both the lanes and the shoulders.*

7. Is HFST installation occurring where you are cold planing?

   *Yes. Refer to the Typical Sections and Roadway Plans.*

8. Is the HFST quantity the same as the cold plane quantity SY?

   *Yes. Refer to the quantities for those items on Proposal Schedule page P-8.*

9. Is HFST new? Are there any current jobs that are using it? Can we have the contact info for the person in charge of those jobs to see who has the equipment for HFST?

   *HFST is a new material that is being used on HDOT projects. Refer to response for Question #7 from the prebid meeting.*

10. On Plan Sheet 10:
    a. Where is the work occurring on the roadway plans for the Pulama Rd Shoulder Widening Detail?

       *The work for the Pulama Rd Shoulder Widening Detail on Plan Sheet 10 is occurring on Plan Sheet 15 from BL Sta. 469+50 tp BL Sta. 469+64. The plan view of the work is shown on the inset on the Plan Sheet 15 as well.*

    b. The shoulder work detail shows 3.25' of grass, is hydromulching or new grass needed?

       *The grass shown in the detail is existing grass. No additional grass is required.*

    c. Is ASB needed for the shoulder work?

       *The shoulder will be widened by 2' to provide a wider shoulder for pedestrians and disabled pedestrians to safely access the crosswalk at the intersection. The shoulder will not be subject to loading, so ASB and other subbase are not needed.*

11. On Plan Sheet 12, Is the "widen shoulder at crosswalk" covered via cold planing? It is shown within the paving limits of the ES.

    *No, it will not be covered by cold planing. Plans will be adjusted to show widening extending past the existing ES.*

12. For Spec Section 695 Section 695.03D and 695.04, we are trying to understand items are incidental to the contractor and what items will be paid for. Please clarify.

    *This is the same spec used in the Mokapu Saddle Road Rehabilitation project. Per 695.05 Payment the webpage, hotline, and contractor attendance at meetings will not be paid for. Items in 695.03D, except the ones explicitly stated in 695.05, will be paid for under this item.*

13. For Spec Section 645, why is the lane closure limited to 1000' when the longest paving stretch is 1500'? Most contractors can pave 1500' in a day, but the 1000' lane closure prevents us from doing it. The other two curves are shorter than 1000' and can be done easily. The 1500' curve has to be done in two days.

    *The project area is heavily populated with houses and is the only road in and out. The 1000 L.F. lane closure limit is used to balance traffic volume and roadwork to prevent traffic volume from building up with longer lane closures.*

14. Proposal page P-8, "Item # 626.3000 Adjusting Water Valve Box Frame and Cover - 4 EA", is shown twice. Please confirm if both 626.3000 is correct.

    *This is an error. 626.3000 should only be shown once. Proposal schedule will be revised to reflect this change.*

15. The bid specification for Bid Item 421.1000 – High Friction Surface Treatment -is restrictive in terms of Contractor experience in performing this type of work. There is a lack of local contractors with Hawaii Contractors Licenses who meet the experience requirements described in your specification. Respectfully request to relax the "experience within the last two years."

    *The experience requirement revised to within the last three years.*

16. Respectfully request this item be paid on a Force Account basis.

    *HFST will remain as unit quantity.*

**KAMEHAMEHA HIGHWAY SAFETY IMPROVEMENTS**
**PROJECT NO. HSIP-083-1(66)**
October 22, 2018

PRE-BID MEETING SIGN IN LOG

| NAME | COMPANY | PHONE NUMBER | EMAIL ADDRESS |
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