

**ADDENDUM NO. 2**

**Measure C Road Rehabilitation Project 2016  
Contract 16-05**

**March 31, 2016**

**OWNER:**

Town of Paradise  
5555 Skyway  
Paradise, CA 95969  
(530) 872-6291  
(530) 877-5059 (fax)

**GENERAL:**

***Scope:***

1. The purpose of this Addendum No. 2 is to notify Bidders of clarifications to the Contract Documents for the above project. This Addendum shall be attached to and become a part of said Contract Documents.
2. This Addendum consists of 7 pages, including attachments.

***Acknowledgment:***

1. This Addendum shall be signed by the bidder, dated and submitted with the bid package for the project

**PROJECT SPECIAL PROVISIONS ARE MODIFIED AS FOLLOWS:**

1. Replace Section 37 with the revised specification shown as Attachment A of this Addendum.

**PROPOSER:**

\_\_\_\_\_  
NAME

\_\_\_\_\_  
ADDRESS 1

\_\_\_\_\_  
ADDRESS 2

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
DATE

**PREPARED BY:**

 03/31/16  
TOWN OF PARADISE DATE

**END OF ADDENDUM**

## **SECTION 37    MICRO-SURFACING**

### **37-1.    Description**

Micro-Surfacing is a mixture of polymer modified asphalt emulsion, mineral aggregate, mineral filler, water, and other additives, properly proportioned, mixed and spread on a paved surface. The mix should be capable of being spread in variable cross-sections (ruts, scratch courses and surfaces) which, after curing and initial traffic consolidation resists deformation throughout the entire design tolerance range of bitumen content and variable thickness to be encountered. The end product should maintain a skid-resistance surface (high wet friction coefficient of 0.30 or better) throughout the warranty period and / or service life of the Micro-Surfacing. The mix is to be a “quick-traffic system”, meaning that it will be able to accept traffic after a limited curing time. The amount of time will vary from job to job and must be evaluated on an individual job basis. Normally, these systems have been accepting moving traffic on a one-half (1/2) inch (12.7 mm) thick surface within one hour after placement in +75°F (24°C) temperature and 50 percent or less humidity.

### **37-2.    Micro-Surfacing Emulsion**

#### *General*

The emulsified asphalt shall be a quick-traffic polymer- modified asphalt emulsion conforming to the requirements specified in AASHTO M208 or ASTM D2397 for CSS-1h. The cement mixing test shall be waived for this emulsion.

The polymer material shall be milled or blended into the asphalt or emulsifier solution prior to the emulsification process.

#### *Certification*

The polymer content shall be 3.5% based on the asphalt weight content and will be certified by the emulsion supplier.

The contractor must submit a notarized certification from the polymer supplier 5 days prior to the product being used.

The five-day (5) settlement test may be waived, provided job stored emulsion is used within thirty-six (36) hours from the time of the shipment, or the stored material has had additional emulsion blended into it prior to use.

#### *Quality Tests*

When tested according to the following tests, the emulsion shall meet the requirements of AASHTO M208 or ASTM D2397 for CSS-1h, plus the following:

Property	Test Method	Specification
Viscosity @ 25 degrees C, SSF	AASHTO T 59	15 - 90 seconds
Sieve Test, maximum	AASHTO T 59	0.30%
Settlement, 5 days, maximum	ASTM D 244	5%
Storage Stability, 1 day, maximum	AASHTO T 59	1%
Residue by Evaporation, minimum	California Test 331	62%

Residue by evaporation must comply with:

Property	Test Method	Specification
G * @ 20 degrees C, 10 rad/sec, MPa	AASHTO T 315	Report Only
Penetration @ 25 degrees C	AASHTO T 49	40 - 90
Phase Angle @ 50 degrees C, 10 rad/sec, PA (maximum) - PA base	AASHTO T 315	Report Only

Softening Point, minimum, degrees C	AASHTO T 53	57
Stiffness @ -12 degrees C, MPa, and M-value	AASHTO T 313	Report Only

Each load of emulsified asphalt shall be accompanied with a Certificate of Analysis/Compliance to assure that it is the same as that used in the mix design.

**37-3. Aggregate**

*General*

The mineral aggregate used shall be the type and grade specified for the particular use of the Micro-Surfacing. To assure the material is totally crushed, 100 percent of the parent aggregate will be larger than the largest stone in the gradation to be used. Contractor shall use Type 3 Aggregate. **Aggregate shall be black in color.**

*Quality Tests*

When tested according to the following tests, the aggregate should meet these minimum requirements:

Test	California Test	Type 3
Sand Equivalent	217	65 min.
Durability Index	229	65 min.
Percentage of Crushed Particles	205	100%

*Grading*

When tested in accordance with AASHTO T27 (ASTM C136) and AASHTO T11 (ASTM C117), the target (mix design) aggregate gradation (including the mineral filler) shall be within the following.

Grading			Type 3 % Passing
Sieve Size	Sieve Opening		
3/8	9.5	mm	100
#4	4.75	mm	70 - 90
#8	2.46	mm	40 - 60
#16	1.18	mm	20 - 40
#30	600	µm	12 - 25
#200	75	µm	5 - 15

The job mix (target) gradation shall be within the gradation band for the desired type. After the target gradation has been submitted (this should be the gradation that the mix design is based on), then the percent passing each sieve shall remain within the gradation band. It is recommended that the percent passing shall not go from the high end to the low end of the range for any two consecutive screens.

The aggregate shall be inspected, accepted or rejected at the job location stockpile or when loading into the support units for delivery to the lay-down machine. The stockpile shall be accepted or rejected based on five gradation tests according to ASTM D75 or CAL 202. Sampling of the stockpile material shall be performed in accordance with CAL 125. If the average of the five tests is within the gradation tolerances, then the materials will be accepted. If the tests show the material to be out of specification, the contractor will be given the choice to either remove the material or blend other aggregate with the stockpiled material to bring it into specification.

**37-4. Mineral Filler**

Mineral filler, if required, shall be any recognized brand of non-air entrained Portland cement or hydrated lime that is free from lumps. It may be accepted upon visual inspection. The type and amount of mineral filler needed shall be determined by a laboratory mix design and will be considered as part of the aggregate gradation. An increase or decrease of less than one percent (1%) may be permitted when the Micro-Surfacing is being placed if it is found to be necessary for better consistency or set times.

**37-5. Water**

The water shall be potable, free of harmful soluble salts or reactive chemicals and any other contaminants.

**37-6. Additives**

Additives may be added to the emulsion mix or any of the component materials to provide the control of the quick-traffic properties. They must be included as part of the mix design and be compatible with the other components of the mix.

**37-7. Laboratory Evaluation**

Before the work commences, the contractor shall submit a signed, certified mix design covering the specific materials to be used on the project. This design will be performed by a laboratory which has experience in designing Micro-Surfacing.

The contractor shall submit for approval a complete mix design prepared and certified by a laboratory. Compatibility of the aggregate, polymer-modified emulsion, mineral filler, and other additives shall be verified by the mix design. The mix design shall be made with the same aggregate gradation that the contractor will provide on the project. Recommended tests and values are as follows:

ISSA Test No.	Description	Specifications
ISSA TB-139 (Wet Cohesion)	@ 30 Minutes Minimum (Set)	12 kg-cm Minimum
	@ 60 Minutes Minimum (Traffic)	20 kg-cm Minimum or Near Spin
ISSA TB109	Excess Asphalt by LWT Sand Adhesion	50 g/ft <sup>2</sup> Maximum (538 g/m <sup>2</sup> )
ISSA TB-114	Wet Stripping	Pass (90% Minimum)
ISSA TB-100 (Wet Track Abrasion Loss)	One-hour Soak	50 g/ft <sup>2</sup> (538 g/m <sup>2</sup> ) Maximum
	Six-day Soak	75 g/ft <sup>2</sup> (807 g/m <sup>2</sup> ) Maximum
ISSA TB-147	Lateral Displacement	5% Maximum
	Specific Gravity after 1,000 Cycles of 25 Pounds (11.34 kg)	2.10 Maximum
ISSA TB-144	Classification Compatibility	11 Grade Points Minimum
ISSA TB-113	Mix Time @ 77 F (25 C)	Controllable to 120 Seconds Minimum

Component Materials	Limits
Residual Asphalt	5.5 to 10.5% by dry weight aggregate
Mineral Filler	0.0 to 3% by dry weight of aggregate
Polymer-Based Modifier	Minimum of 3.5 % solids based on bitumen weight content
Additives	As needed
Water	As required to produce proper mix consistency

**37-8. Rate of Application**

The Micro-Surfacing mixture shall be of the proper consistency at all times, so as to provide the application rate required by the surface condition. The average single application rate, shall be in accordance with the following table or as specified by the Engineer:

Aggregate Type	Application Rate Range (dry pounds per yard)
Type 3	20 - 32 lb/yd <sup>2</sup>

**37-9. Equipment and Use***General*

All equipment, tools, and machines used in the performance of this work shall be maintained in satisfactory working condition at all times to ensure a high-quality product.

*Proportioning Devices*

Individual volume or weight controls for proportioning each material to be added to the mix (i.e., aggregate, mineral filler, emulsified asphalt, additive, and water) shall be provided and properly marked. These proportioning devices are used in equipment calibration and in determining the material output.

*Spreading Equipment*

The mixture shall be agitated and spread uniformly in the surfacing box by means of twin-shafted paddles or spiral augers fixed in the spreader box. At the discretion of the Engineer, a non-auger baffle box may be used. A front seal shall be provided to insure no loss of the mixture at the road contact point. The rear seal shall act as a final strike-off and shall be adjustable. The spreader box and rear strike-off shall be so designed and operated that a uniform consistency is achieved to produce a free flow of material to the rear strike-off. The spreader box shall have suitable means provided to side shift the box to compensate for variations in the pavement geometry.

At the discretion of the Engineer, a secondary strike-off shall be provided if it improves the surface texture.

*Roller*

The Micro surface shall be rolled after the surfacing coat has cured sufficiently so as not to pick up on the vehicle tires, but not more than 24 hours after placement. The rollers shall be ten-ton (10) self-propelled pneumatic rollers, with tire pressure of 50 psi and a water spray system. There shall be a minimum of two operating rollers on the same newly constructed surface, tandem rolling, during the compaction rolling process. The micro-surfacing coat shall be given a minimum of two complete passes with the roller or until the material is compacted with a uniform surface.

*Wheel Path Depression (Rut) Box*

A wheel path depression (rut) box shall be used and designed to have adjustable strike-off devices to regulate the depth of the material and shall have a width of between 5 ft. (1.52 m) and 6 ft. (1.81 m). Hydraulic augers, or similar devices, shall be installed and shall be capable of moving the mixed material from the rear to the front of the filling chamber. These devices shall also be capable of guiding the larger aggregate into the center, deeper section of the wheel path depression, and forcing the finer material toward the outer edges of the spreader box.

In areas inaccessible to the wheel path depression (rut) box, the micro surfacing mixture may be spread by other methods approved by the Engineer

**37-10. Weather Limitations**

Micro-Surfacing shall not be applied if either the pavement or air temperature is below 50°F (10°C) and falling, but may be applied when both pavement and air temperatures are above 45°F (7°C) and rising. No Micro-

Surfacing shall be applied when there is the possibility that the finished product will freeze within 24 hours.

### **37-11. Surface Preparation**

Prior to the Micro-Surfacing operation the Contractor shall remove any vegetation within the limits of the surface treatment by applying an approved herbicide. The herbicide shall be applied at least 10 days prior to the surfacing operation, or as directed by the manufacturer of the approved herbicide. Reward and Round Up are pre-approved herbicides. All other herbicides shall be submitted by the contractor for approval by the Agency, and shall be certified for use in the State of California for the specific use intended. The application of the herbicide shall be performed in accordance with all applicable regulations. Any and all fines or clean-up costs for unlawful misuse or discarding of herbicides shall be the sole responsibility of the Contractor. Mixtures and spread rates for the herbicides shall be determined by the manufacturer's specifications. Wash down of equipment or discarding of herbicides shall not enter the catch basins or positive drainage facilities.

Prior to the sealing operation, the Contractor shall remove all existing thermoplastic striping, thermoplastic legends and raised pavement markers within the surfacing limits. When removing the raised pavement markers the Contractor shall remove excessive adhesive left on pavement caused from the removal of raised pavement markers. If excessive pavement damage occurs from the removal of raised pavement markers the damage shall be repaired by filling with patching material. Removal shall be done to the satisfaction of the Engineer.

Immediately prior to the Micro-Surfacing operations, the Contractor shall sweep the entire surface with vacuum assisted power brooms. Prior Micro-Surfacing application, pavement surfaces shall be cleaned of all oil, debris, grease spots and weeds. Areas that have been patched within the past 60 days shall receive a fog seal.

Before Micro-Surfacing is to be applied all personnel covers, drain inlet covers, monument covers, and all other utility covers shall be protected from the Contractor's surfacing operations by applying a sheet of plastic, cut to fit, or placing a plastic bag over the exposed facilities or other methods approved by the Engineer. All traces of plastic and excess surfacing material shall be removed from all covers of facilities and other utility covers as quickly as possible after the application of the Micro-Surfacing and definitely prior to final acceptance.

### **37-12. Schedule**

Contractor shall furnish a computer generated schedule for the work, listing the dates on which individual streets or locations are to have traffic control in place for Micro-Surfacing. The Contractor shall adhere diligently to said schedule in the prosecution of the work. The Contractor must submit a traffic control plan for the project to the Engineer for approval prior to commencing with the project.

### **37-13. Placement**

The Micro-Surfacing mixture shall be uniformly spread on the existing surfacing within the rate specified without spotting, re-handling, or otherwise shifting the mixture. Micro surfacing shall be spread at a rate as determined by the condition of the road surface and as specified in the project special provisions.

When wheel path depressions have a cross section that is deformed ½ inch (12.5 mm) or more, the individual wheel paths shall first be filled utilizing a wheel path depression (rut) box. The depth of the wheel path depression shall be determined after adjacent ridges have been removed. The maximum single application for wheel path depressions shall be 1 inch (25 mm). Wheel path depressions of depths greater than 1 inch (25 mm) shall require multiple applications in each depression.

On multi-lane, arterial and collector roadways, longitudinal joints shall correspond with the edges of the final traffic lanes. The Engineer may permit other patterns of longitudinal joints if the patterns will not adversely affect the quality of the finished product.

Longitudinal joints common to two (2) traffic lanes shall be butt joints with overlaps not to exceed 3 inches (76 mm). Building paper shall be placed at the transverse joints to avoid double placement of the micro surfacing. Other methods to avoid double placement of the micro surfacing shall be reviewed and approved as necessary. Hand tools shall be available to remove spillage.

The mixture shall be uniform and homogeneous after placing on the surfacing and shall not show separation of the MSE and aggregate after setting. The completed surface shall be of uniform texture and free from ruts, humps, depressions, or irregularities.

Approved means shall be provided to protect the micro surfacing from damage by traffic until such time that the mixture has cured sufficiently so that the micro surfacing will not adhere to or be picked up by the tires of vehicles.

**37-14. Stock Pile Sites**

The sites for stockpiling shall be clean and free of objectionable materials and shall be located outside the street right-of-way. Arrangements for these sites shall be the responsibility of the Contractor. If on private property, a written agreement shall be provided to the Engineer prior to commencing operations. For purposes of this contract, the construction zone is defined to be the stockpile area, the area to be sealed, and all streets and public rights-of-way in between.

**37-15. Clean-up**

The Contractor shall clean up the job site prior to acceptance of the work. All dirt, spoil, and debris of any nature shall be removed and the entire site shall present a clean, workmanlike appearance to the satisfaction of the Engineer. Any damage to paint work, caused from spillage, or splattering from prime coating, paving or seal coating operations shall be corrected to the satisfaction of the Engineer.

**37-16. Measurement and Payment**

Micro-Surfacing shall be measured and paid for per square yard which shall include full compensation for furnishing all labor, materials, equipment and incidentals, notifying property owners and completing all the work involved in the constructing the Micro-Surfacing.