Department of Property & Procurement

Government of the United States Virgin Islands

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HTTP://DPP.VI.GOV

AMENDMENT ONE (1)

March 6, 2016

TO: _____

_____

SUBJECT: **IFB008DPWC17 (C) East Scenic Road Phase II Pavement Preservation and Drainage Improvement, St. Croix District.**

INSERT: **See Attached, Additional Specifications, New Bid Sheet Schedule D-2 thru D-8 & New Open Date Wednesday, March 15, 2017 at 10:00 a.m.**

DELETE: **Old Bid Sheet Schedule D-2 thru D-8 & Old Open Date Wednesday, March 8, 2017 at 10:00 a.m.**

All other terms and conditions remain the same.

A copy of this amendment must be returned with your bid.

PRE-BID CONFERENCE

February 22, 2017 10:00 AM
VI-78(005)
Scenic Road Phase 11 Pavement Preservation and Drainage, St. Croix
IFB-008DPWC17(C)

Agenda

Bid Opening Date:	At 10:00 am on March 8, 2017
Contract Time:	270 Calendar Days (Contract Book, D-1)
DBE Goal:	21%
Project Management & Inspection by:	DPW – Office of Highway Engineering John Paul David P.E, Construction Program Manager Bradford Marshall Jr, Project Engineer Frederick Mohammed Jr, Materials Control/Construction Inspector, Rishaun Burke Construction Inspector
DBE Program Management:	Shelton Schulterbrandt, DBE Program Coordinator
Funding:	100% Funded by Federal Highway Administration
Office of Civil Rights:	Sharon Challenger-OJT Program

Discussion Items:

- Suggest Prospective Bidders read carefully and follow the Notice To Bidders sheet B-3 & B4 in particular, the last paragraph on mathematically and materially unbalanced bids. Sheet B-5 includes a checklist to which prospective bidders should also pay close attention. Please read carefully the "BID SCHEDULE NOTES TO BIDDERS" Page D-1. These notes state all of the rules that apply when filling out your bid schedule.-***There were no queries raised relative to all the items above.***

- Disadvantaged Business Enterprise goal is 21%. DBE staff will assist with any questions or clarifications on compliance with DBE requirements for this IFB.-***All contractors were notified about the need to obtain the latest DBE listing from the DBE OCR Office at DPW.***

Daniel Schierloh of VI Paving Inc. requested that the DBE Goal should be reduced to 18%. In response to this query he was advised that he should try to attain the 21% goal and if he has difficulties in meeting the goal, he should work along with the DBE Office so that the office would evaluate whether a good faith effort was made to attain the goal.

- It is policy for all documents required for bid submittal (for the awarded bidder) to be bound in the Contract Book for execution of the contract. If you are awarded a contract you will be required to submit your Contract Book for this purpose.***-No queries raised with respect to this matter.***

-The Office of Civil Rights along with PR FHWA Office has commenced an on the job training program with this project. Ms. Sharon Challenger the Civil Rights coordinator provided a brief description of the aims and objectives of the program. The program reimburses the contractor for the purchase of PPE for the trainees. Trainees should be paid no less than the minimum wage on a scale outlined by Ms. Challenger. The Goal for the year is to train about 5 individuals. Payment for this item is supported by supplemental specification item 15901.-
Numerous queries and discussions followed the description of the program provided by Ms. Challenger. In response to a query about the wage rates, and the minimum amount of hours to be worked in a given week by a trainee, Ms. Challenger informed the meeting that trainees should be paid no less than the minimum wage and payments would be increased on a scale as the trainee progresses. The hours to be worked are at the discretion of the contractor's management. If a trainee works on another Federal-aid project during the training period the hours would be payable as under the original project and counted as training hours. In response to a query from Todd Jung, Ms. Challenger provided a schedule of rates that are payable to the completion of the project. Arising from the discussions around the table the quantity which was given for the line item in hours is now revised to a Lump Sum (LS). As a result, a new bid schedule is issued with this change as ADDENDUM NUMBER 1.
It was suggested that contractors work very closely with the Office of Civil Rights during the preparation of their bids.

- Bidders should pay particular attention to the requirements of the Buy America Requirements of this contract. The requirements under moving Ahead for Progress in the 21st century (MAP-21) as summarized in the last paragraph extends Buy America requirements to non FHWA funded utility relocations. This requirement is raised in particular on this project in light of the fact that there are utility agreements in place for the adjustment of WAPA and Innovative overhead lines and poles on Scenic Road.-
In response to a query from Daniel Schierloh, the meeting was informed that

utility agreements were executed by both Innovative and WAPA for the adjustment of their facilities in keeping with paragraph 28 of the General Provisions of the contract. A question was asked in the event that the utility companies fail to respond to the adjustments in a timely manner will the contractor be entitled to compensation should his performance be adversely impacted. The answer is no. The contractor is responsible to coordinate with the utility companies to execute their work as required by Paragraph 28 of the General Provisions of the contract. If the companies fail to perform, the responsibility falls on the utility company and not the Government of the United States Virgin Islands. The number of utiltity poles to be adjusted on this contract is 15.

Project Description – Install paved waterway, remove existing headwalls and pipe culvert, install pipe culverts, install guardrails, roadway reconstruction, striping of roadway and installation of signs. ***– A query was raised by Daniel Schierloh in which he asserted that Rock Excavation as an item of work is missing from the bid schedule. He was referred to item 4 in the instructions to Bidders (Construction Contract) which states***

4. Interpretation of Estimates.

(a) The estimate of quantities of work or services to be performed and materials to be furnished appearing on the proposal forms and on the plans, is approximate only and is given for the sole purpose of comparing bids and determining the award of the contract. The Department does not expressly, or by implication, guarantee that the actual quantities will agree with those shown on the proposal form and the contractor shall not plead misunderstanding or deception of such estimate of quantities or the character, location or other conditions pertaining thereto. The Department reserves the right to increase or decrease any or all of the above-mentioned quantities of work or services or to omit any of them as may be deemed as necessary, as herein provided.

(b) Only such quantities of the respective items of work or services actually performed and accepted or of materials furnished and accepted will be paid for.

The item of work in question roadway excavation according to FP-03 requires that all material encountered regardless of its nature or characteristics be removed. In response to a query from Todd Jung of VI Paving, blasting would not be allowed if rock is encountered during execution of the work.

Bidders attention is directed to the following Sections: General Provisions (F1-F48), Supplemental Specifications (S1 – S12), and Special Specifications (T1 – T25).- ***Paragraph 40 (C) of the General Provisions of the contract which references the 20% of the liquidated damages specified in the table above should be deleted.***

Paragraph 14 (a) page C-7 which reads " In the event of tied bids...." Should be deleted.

The successful bidder will be provided with a copy of the current Earth Change and Building Permits issued by Department of Planning and Natural Resources (DPNR).-

Utility Agreement have been executed with Innovative Telephone Company to adjust overhead telephone and cable TV lines and with WAPA for the relocation of a number of utility poles and overhead lines.

Item 15201-Construction Survey and Stakeout- Bidders must pay attention to the full scope of this item as per FP-03 and as amended by the Special Specifications. Survey work must be undertaken by a professionally qualified land surveyor. In order to properly execute this project, it is necessary that the surveyor establish a centerline profile of the existing roadway as the basis of construction to establish horizontal and vertical control for construction according to the typical cross section details. – ***In reply to a query from D. Schierloh on the datum to be used, he was advised that the existing centerline and gradients should be used as reference.***

Item 154 of the Special Specifications requires that the contractor provide a full time technically qualified materials technician to perform testing in a timely and accurate manner whenever testing is required.

Item 40301A, B and C- Hot Asphalt Concrete Pavement- Warm mix Asphalt should be used in all applications as part of the implementation of Every Day Count initiative (EDC). In addition, safety edge should be used on paving machines so as to bring out the desired effects. This is the second EDC initiative to be implemented in this project.

A brochure on warm mix asphalt is issued as an addendum to this meeting as ADDENDUM NUMBER 2. Further information can be obtained from the materials control manager Mr. Frederick Mohammed.

Information on the application of safety edge may be obtained at https://www.youtube.com/watch?v=wjqCLp_KqN8
A second brochure on the EDC initiative on application of safety edge is issued as ADDENDUM NUMBER 3. - Details on safety edge is given on sheet G-6 of the plans.

Specifications for WMA is issued as Addendum Number 4.

Discussion Items by Contracting Officer (Property and Procurement):none

Questions / Comments / Clarifications

Daniel Schierloh asked a query on the clarification of Roadway Reconditioning.- Roadway reconditioning as per FP-03 calls for the performance of all applicable work in subsections 303.03 to 303.06. The cross section sheets illustrate the work to be completed as well as the note 5 on Sheet B2 of the drawings.

Participants were informed that the deadline for submission of queries related to this IFB was the close of business on Monday February 27, 2017. Queries should be sent to Ms. Alexis Leycock of the Department of Property and Procurement.

The meeting was adjourned until March 8, 2017 at 10:00 am.

All other terms and conditions of this IFB remains the same

BID SCHEDULE

IFB NO._____ PROJECT NO. VI-0078(005)

CONTRACTOR'S NAME:_____

_____

CITY STATE ZIP CODE

The undersigned Contractor proposed to furnish all labor, tools, equipment, machinery, and supplies for the East Scenic Road Pavement Preservation Phase II to Route 78 subject to all conditions and requirements of the Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, FP-03 as revised and amended and the Contract Documents.

ITEM NO.	APPRX. QUANT.	ITEM AND UNIT PRICE BIDS (IN WORDS)	UNIT PRICES DOLLARS/CENTS	AMOUNT DOLLARS/CENTS
15101	Lump Sum	Mobilization		
15201	Lump Sum	Construction Survey & Stakeout		
15401	Lump Sum	Contractor Sampling and Testing		
15701 (A)	3,225 L.F.	Soil Erosion Control - Silt Fence		
15701 (B)	120 C.Y.	Soil Erosion Control - Construction Entrance		
15701 (C)	12 EA.	Soil Erosion Control - Temporary Inlet Protection		

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BIDDER'S SIGNATURE

ITEM NO.	APPRX. QUANT.	ITEM AND UNIT PRICE BIDS(IN WORDS)	UNIT PRICES DOLLARS/CENTS	AMOUNT DOLLARS/CENTS
15901	Lump Sum	On the Job Training (OJT) Program		
20301(A)	1 EA.	Removal of Structures – Headwall and Basins		
20301(B)	58 L.F.	Removal of Structures – Removal of 15" and 24" Pipe Culvert		
20301(C)	244 S.Y.	Removal of Structures – Removal of Concrete Driveway		
20401	7,500 C.Y.	Excavation and Embankment-Roadway and Slope Excavation		
25101	224 C.Y.	Riprap – Grouted Rip Rap, Class III		
30101(A)	9,500 S.Y.	Untreated Aggregate Courses – Aggregate Grade "B "(10" Depth)		

BIDDER'S SIGNATURE

ITEM NO.	APPRX. QUANT.	ITEM AND UNIT PRICE BIDS(IN WORDS)	UNIT PRICES DOLLARS/CENTS	AMOUNT DOLLARS/CENTS
30101(B)	9,500 S.Y.	Untreated Aggregate Courses – Aggregate Grade "C "(4" Depth)		
30301	62 STA.	Road Reconditioning		
40301(A)	2,100 TON	Warm Asphalt Concrete Pavement – Class "A", Grade "E" (Wearing Course		
40301(B)	1,900 TON	Warm Asphalt Concrete Pavement – Class "A", Grade "C" (Base Course)		
40301(C)	1,050 TON	Warm Asphalt Concrete Pavement – Class "A", Grade "C" (Wedge and Leveling)		
41101	820 GAL.	Asphalt Prime Coat, Grade RS-1		
41201	6,000 GAL.	Asphalt Tack Coat, Grade RS-1		

BIDDER'S SIGNATURE

ITEM NO.	APPRX. QUANT.	ITEM AND UNIT PRICE BIDS(IN WORDS)	UNIT PRICES DOLLARS/CENTS	AMOUNT DOLLARS/CENTS
55201(A)	13 C.Y.	Structural Concrete Headwall		
60101(A)	143 C.Y.	Concrete- Parapet wall at Waterway		
60201(A)	56 L.F.	Culverts and Drains–15" Reinforced Concrete Pipe Culvert, Class IV		
60201(B)	336 L.F.	Culverts and Drains–24" Reinforced Concrete Pipe Culvert, Class IV		
60201(C)	10 EA.	Culverts and Drains–24" Reinforced Concrete Pipe End Section Class IV		
60401(A)	1 EA.	Manhole, Inlet, Catch Basins, Inlet Type 5B, w/ 4' x 4'Metal Frame and Grate and Slot		
60401(B)	10 EA.	Manhole, Inlet, Catch Basins, Inlet Type 5B, w/ 3' x 2'Metal Frame and Grate and Slot		

BIDDER'S SIGNATURE

ITEM NO.	APPRX. QUANT.	ITEM AND UNIT PRICE BIDS(IN WORDS)	UNIT PRICES DOLLARS/CENTS	AMOUNT DOLLARS/CENTS
60701	92 L.F.	Cleaning Reconditioning Repairing Drainage Structure		
60801(A)	1,675 S.Y.	Paved Waterway, Type IV		
60801(B)	400 S.Y.	Paved Waterway, Type IV with Dissipators		
60801(C)	587 S.Y.	Low Waterway Crossing Paved Waterway, Type IV		
60901	150 L.F.	Curb and Gutter 18" Depth		
61701(A)	3,585 L.F.	Guardrail – System G-4, Type II Class "B" with Button Reflectors		
61701(B)	4 EA.	Guardrail – Terminal Section, Tangent Type with Reflector		

BIDDER'S SIGNATURE

ITEM NO.	APPRX. QUANT.	ITEM AND UNIT PRICE BIDS(IN WORDS)	UNIT PRICES DOLLARS/CENTS	AMOUNT DOLLARS/CENTS
61701(C)	4 EA.	Guardrail – Rounded End Section with Reflector		
63301(A)	222 S.F.	Permanent Traffic Control – Sign Aluminum, Type IX Reflective Sheeting		
63301(B)	4 EA.	Permanent Traffic Control – Sign Remove & Reset		
63401(A)	12,900 L.F.	Permanent Pavement Markings-Thermoplastic, Type H (4" White)		
63401(B)	12,500 L.F.	Permanent Pavement Markings-Thermoplastic, Type H (4" Yellow)		
63401(C)	80 L.F.	Permanent Pavement Markings-Thermoplastic, Type H (24" White)		
63501(A)	6 EA.	Temporary Traffic Control – Barricade Type III		

BIDDER'S SIGNATURE

ITEM NO.	APPRX. QUANT.	ITEM AND UNIT PRICE BIDS(IN WORDS)	UNIT PRICES DOLLARS/CENTS	AMOUNT DOLLARS/CENTS
63501(B)	50 EA.	Temporary Traffic Control – Cone s Type IV Reflectivity(36" Height)		
63501(C)	387 S.F.	Temporary Traffic Control – Construction Signs Type VI Reflectivity		
63501(E)	50 EA.	Temporary Traffic Control – Drums, Type IV Reflectivity		
63501(E)	5,000 HR.	Temporary Traffic Control – Flagger		
63501(F)	20 EA.	Temporary Traffic Control - Warning Lights, Type "A"		

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BIDDER'S SIGNATURE

IFB NO. _____ PROJECT NO. VI-0078(005)

ATTENTION: See notes at the beginning of this unit price schedule.
TOTAL AMOUNT OF THIS PRPOSAL, BASED ON ENGINEER'S ESTIMATE OF QUANTITIES IS AS FOLLOWS:

_____DOLLARS_____CENTS

$_____

_____
BIDDER'S SIGNATURE

Warm Mix Asphalt (WMA) Guide Specification for Highway Construction

Division 400 - Asphalt Pavements and Surface Treatments

SECTION 406 - WARM MIX ASPHALT (WMA) PAVEMENT

Warm mix asphalt (WMA) is the generic term used to describe the reduction in production, paving, and compaction temperatures achieved through the application of one of several WMA technologies.

Some modifications to HMA plants may be necessary to accommodate the WMA technologies as noted in Section 406.03 Construction.

Production and paving temperatures may need to be increased for higher recycled asphalt pavement (RAP) contents, increased haul distances, decreased ambient temperatures, or other WMA project specific conditions.

All provisions for the production and placement of conventional HMA mixtures as stipulated in Standard Specification for Construction and Bridges on Federal Highway Projects (FP), Section 403 are in force except as noted below.

406.01 Description

Construct one or more courses of plant produced warm mix asphalt (WMA) pavement on a prepared foundation, using virgin aggregate or a combination of virgin and/or reclaimed aggregate material (RAM) and prescribed manufactured WMA additives and/or WMA plant process modifications. Use of RAP materials, consisting of cold milled, crushed, or processed bituminous asphalt mixture are permitted at the current 25 percentages, provided that the mixture meets all the requirements of these specifications.

406.02 Material

WMA may be produced by one or a combination of several technologies involving HMA plant foaming processes and equipment, mineral additives, or chemicals that allow the reduction of mix production temperatures to within 185°F to 275°F. *(Note: The upper temperature range is appropriate for modified asphalt binders and WMA mixtures which include higher percentages of reclaimed asphalt pavement.)*

Provide materials as specified in:

Aggregate	Subsection 703.07 or 703.17
Antistrip additive	Subsection 702.08
Asphalt binder	Subsection 702.01
Mineral Filler	Subsection 725.05
Recycled Asphalt Pavement	Subsection 703.19
Recycling Agent	Subsection 702.06

406.03 Construction

A. *Mix Design*. Develop and submit a job mix formula for each mixture according to AASHTO R 35. Each job mix formula must be capable of being produced, placed, and compacted as specified. Apply all mix design requirements for HMA to the development of the WMA mix design.

Submit a written job mix formula for review and approval at least 28 days before production, or when sources of asphalt binder, aggregates, WMA additives, or other components of the mix change.

Submit the following information:

1. All information required in the report section of AASHTO R 35.
2. WMA technology and/or WMA additives information.
3. WMA technology manufacturer's established recommendations for usage.
4. WMA technology manufacturer's established target rate for water and additives, the acceptable variation for production, and documentation showing the impact of excessive production variation.
5. WMA technology material safety data sheets (MSDS).
6. Documentation of past WMA technology field applications including project type, project owner, tonnage, location, mix design, mixture volumetrics, field density, and performance.
7. Temperature range for mixing.
8. Temperature range for compacting.
9. Asphalt binder performance grade test data over the range of WMA additive percentages proposed for use.
10. WMA mixture performance test results.
11. Laboratory test data, samples and sources of all mixture components, and asphalt binder viscosity-temperature relationships.

B. *Additives*. Use anti-stripping additives, silicone additives, WMA additives, and WMA technologies as specified. Comply with approved mix design quantities. Confirm the addition rate through field tests performed during production. Comply with the manufacturer's recommendations for incorporating additives and WMA technologies into the mix. Comply with manufacturer's recommendations regarding receiving, storage, and delivery of additives. Maintain supplier recommendations on file at the asphalt mixing plant and make available for reference while producing WMA.

C. *Sampling*. Perform sampling according to the following standards:

1. *Aggregate*. AASHTO T 2.
2. *Asphalt Binder*. AASHTO T 40.
3. *Warm Mix Asphalt (WMA) Plant Mix*. AASHTO T 168.

D. *Weather Limitations*.

1. Place WMA mixtures only on dry, unfrozen surfaces and only when weather conditions allow for proper production, placement, handling, and compacting.

2. Meet Table 401-2 placement temperatures.

E. *Equipment*. Use equipment and WMA technologies capable of producing an asphalt mixture that meet specification requirements and is workable at the minimum placement and compaction temperature desired, regardless of storage or haul distance considerations.

1. *Asphalt Mixing Plant.* Meet AASHTO M 156 and FP Subsection 401.04.

Modify the asphalt mixing plant as required by the manufacturer to introduce the WMA technology.

Plant modifications may include additional plant instrumentation, the installation of asphalt binder foaming systems and/or WMA additive delivery systems, tuning the plant burner and adjusting the flights in order to operate at lower production temperatures and/or reduced tonnage.

(Note: Implementation of best management practices in the control of aggregate moisture content prior to introduction to the drying or mixing drum is highly recommended in order to achieve the maximum benefit of WMA technology.)

Combine and mix the dried aggregates and asphalt binder to meet the job mix formula. Ensure a minimum of 95 percent uniform coating of aggregates according to AASHTO T 195.

Correct procedures if storing or holding causes segregation, excessive heat loss, or a reduced quality mixture. Properly dispose of mixture which does not meet specifications.

G. *Preparing Base or Existing Surface.* Clear surface of debris and deleterious material. Apply and cure tack coat before placing the WMA. Apply a tack coat on all surfaces, curbs, gutters, manholes, or other structure surfaces, that will be in contact with the WMA.

Repair damaged areas of the base or existing surface. Restore the existing surface or base to a uniform grade and cross section before placing the mix.

H. *Pre-paving Requirements.* Prior to placing any WMA mix, produce a sufficient amount of WMA mix to properly calibrate the plant and procedures using the mix design approved for mainline construction. The Engineer will sample and test the WMA mix thus produced for the following:

1. Voids in mineral aggregate (VMA);
2. Asphalt binder content;
3. Gradation;
4. Air voids; and
5. Tensile strength ratio (or Hamburg wheel tracking test for moisture damage)

Heat WMA field samples, transported to the laboratory, to the field production temperature, or lower, when reheating is required for WMA mixture testing.

(Note: Field produced WMA loose mix samples which are immediately compacted and tested, without reheating, may produce lower voids in mineral aggregate and lower air voids test results when compared to reheated samples. This should be validated during the test strip or initial production lot. One possible remedy is to cool the WMA sample to room temperature and reheat to a temperature that is less than or equal to the WMA field production temperature before laboratory compaction. This will minimize the WMA technology's effects on the test results and ensures the sample is not excessively aged.)

Place no WMA mixture that fails to meet specification requirements. WMA mixture not meeting the requirements may be used in the construction of temporary facilities when approved by the Engineer.

Construct a control strip or initial production lot with production materials and equipment. Select compacting methods to meet the specified density. The Engineer will take random loose mix and core samples to verify compliance with job mix and specification requirements. Reconstruct the test strip or initial production lot if the job mix formula, the compacting method, or compacting equipment changes,

or if results do not meet specifications.

I. *Spreading and Finishing*. Spread and finish the mixture with asphalt pavers to specified grade and thickness.

Hand place material in areas inaccessible to mechanical spreading and finishing equipment. Maintain a consistent supply of mixture to ensure uninterrupted paving.

Minimize inconvenience to traffic and protect existing and finished surfaces. Leave only short lane sections, normally less than [26 ft (8 m)], where the abutting lane is not placed the same day, or according to Manual on Uniform Traffic Control Devices (MUTCD) traffic safety requirements.

J. *Compacting*. Compact immediately after spreading and before the WMA mixture falls below the minimum job mix design compaction temperature. Discontinue paving if unable to achieve the specified density before the mixture cools below the minimum recommended WMA job mix design compaction temperature.

Provide the number, weight, type, and sequence of rollers necessary to compact the mixture without displacing, cracking, or shoving. Roll the WMA mixture parallel to the centerline. Begin rolling superelevated curves at the low side and continue to the high side, overlapping longitudinal passes parallel to the centerline.

Maintain a uniform roller speed with the drive wheels nearest the paver. Operate vibratory rollers uniformly at the manufacturer's recommended speed and frequency.

Continue rolling to eliminate all roller marks and to achieve the minimum 92 percent of laboratory density as determined according to AASHTO T 209.

Maintain the line and grade of the edge during rolling.

Prevent the mixture from adhering to the rollers by using very small quantities of detergent or other approved release material.

Hand compact areas inaccessible to rollers.

The Engineer will take random tests of the compacted pavement to verify specification compliance. At no cost to the Agency, remove and replace mixture that does not meet specification requirements or that becomes contaminated with foreign materials. Remove defective materials for the full thickness of the course by saw cutting the sides perpendicular and parallel to the direction of traffic. Coat saw cut edges with bituminous materials and replace the defective material with specification materials.

K. *Joints*. Protect ends of a freshly laid mixture from damage by rollers. Form transverse joints to expose the full depth of the course. Apply a tack coat on transverse and longitudinal joint contact surfaces immediately before paving. Construct all longitudinal joints within 12 in. (300 mm) of the lane lines. Offset longitudinal and transverse joints on succeeding lifts 6 inches (150 mm) to 12 inches (300 mm) from the joint in the layer immediately below. Create the longitudinal joint in the top layer along the centerline of two-lane highways or at the lane lines of roadways with more than two lanes.

L. *Surface Tests*. The Engineer will test pavement surfaces to verify compliance with FP Subsection 401.16, smoothness and texture requirements.

Correct pavement surfaces that do not meet specification requirements by cold milling, diamond grinding, overlaying, or removing and replacing according to the following:

a. *Diamond Grinding.* Diamond grind final pavement surfaces exposed to vehicle traffic to the required surface tolerance and cross section. Remove and dispose of all waste material.

b. Cold Milling. Cold mill intermediate pavement surfaces to the required surface tolerance and cross section. Remove and dispose of all waste materials.

c. *Overlaying.* Use specification materials for overlays. Overlay the full width of the underlying pavement surface. Place a minimum recommended overlay thickness of [1.6 in. (40 mm)]. Use only one overlay.

d. *Removing and Replacing.* Replace rejected areas with WMA pavement materials that meet specification requirements. Test the corrected surface area. Complete all corrections before determining pavement thickness.

406.04 Measurement

The Engineer will measure work acceptably completed as specified in Subsection 109.02. The Engineer will base quantities of asphalt binder on the theoretical mass incorporated into accepted product as verified by samples taken according to Subsection 702.01.

406.05 Payment

Include costs of plant startup operations, considering both labor and materials, in the price bid for the mixture in place.

The Agency will pay for accepted quantities at the contract unit price as follows:

Pay Item Pay Unit
(A) Asphalt Binder ton (Mg), gal (L)
(B) WMA Plant Mix—Type _____ ton (Mg), yd^2 (m^2)

Such payment is full compensation for furnishing all materials, equipment, labor, and incidentals to complete the work as specified.

U.S. Department of Transportation
Federal Highway Administration
1200 New Jersey Avenue, SE
Washington, DC 20590
202-366-4000

Center for Accelerating Innovation

- CAI Home
- Every Day Counts
- STIC Network
- AID Demonstration
- Resources

Warm Mix Asphalt

Warm Mix Asphalt (WMA) is the generic term for a variety of technologies that allow producers of Hot Mix Asphalt (HMA) pavement material to lower temperatures at which the material is mixed and placed on the road. It is a proven a technology that can:

- Reduce paving costs.
- Extend the paving season.
- Improve asphalt compaction.
- Allow asphalt mix to be hauled longer distances.
- Improve working conditions by reducing exposure to fuel emissions, fumes, and odors.

Lower temperatures, lower costs, more opportunities.

WMA production methods use temperatures 30 to 120 degrees Fahrenheit lower than traditional hot-mix asphalt. Because less energy is needed to heat the asphalt mix, less fuel is needed to produce WMA. Fuel consumption during WMA manufacturing is typically reduced by 20percent.

In paving projects, the greater the temperature difference between the asphalt mix and the outside temperature, the faster the mix cools. Since faster cooling effects durability, cold ambient temperatures adversely affect hot-mix asphalt. Relative to HMA, WMA cools more slowly allowing WMA to be successfully placed in lower temperatures. As a result, WMA extends the paving season. It also makes night paving more feasible.

Additionally, WMA saves time in production as well as in surfacing roads. Because WMA makes compaction easier, cost savings are achieved by reducing time and labor spent compacting the mix. Lower temperatures also permit more asphalt mix to be hauled for longer distances, reducing transportation costs.

How does it work? WMA technologies reduce the viscosity (the thickness) of the asphalt binder so that asphalt aggregates can be coated at lower temperatures. The key is the addition of additives (water-based, organic, chemical, or hybrids) to the asphalt mix. The additives allow the asphalt binders and asphalt aggregates to be mixed at the lower temperatures. Reducing the viscosity also makes the mixture easier to manipulate and compact at the lower temperature.

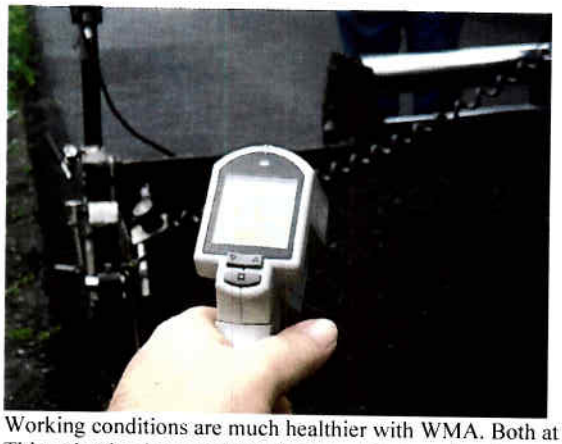
Better performance

Proper compaction is critical to well-performing pavements. One indication of proper compaction is density. Achieving proper density is important because most asphalt paved Federally-funded highways are accepted based on their density. WMA is a compaction tool that can help achieve proper density and improve pavement performance goals.

WMA is also versatile. It has been used successfully in a range of pavement thicknesses. It is durable enough to withstand high traffic demands. WMA has been used in all types of asphalt concrete: dense-graded, stone matrix, porous, and mastic asphalt. Multiple WMA technologies are available, so the choice can be adapted to the temperatures and materials required.

Warm-mix asphalt has been used successfully in Europe for more than 10 years. In the United States, WMA projects are now in more than 40 States.

Good for workers, good for the environment.



Working conditions are much healthier with WMA. Both at the production plant and on the construction site, workers inhale far less smoke and dust. This reduction is particularly important in tunnels, where ventilation is reduced. Comments from workers have been highly positive. According to Brad Neitzke, a Materials Engineer for the Federal Lands Highway, a Division of FHWA, "Certainly, warm-mix improved working conditions at the paving site. The crew's first reaction was to say, "There's no smoke!"

WMA also produces fewer emissions, making it possible for paving to be done on some days when the air quality would typically put a halt to paving. A State transportation official recently attested that "On non-attainment days, when the air quality is bad, we often get shut down and are unable to pave. But with warm-mix [asphalt], because the emissions are reduced, we might be able to pave even on days when the air quality is not the best."

Internationally recognized. WMA is clearly an important technology for the 21st century. The World of Asphalt's "People, Plants, and Paving Training Program" focused attention to WMA, with multiple sessions at its 2010 conference. At least 14 State Highway Agencies have adopted specifications to accommodate WMA, and more than 40 States have roads paved with WMA. This green technology is increasing the quality of our roads and our environment.

Contact

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Resources

Brochure

FAQs

NCHRP Report 691: Mix Design Practices for WMA

Warm Mix Asphalt: European Practice

Articles

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Warm Mix Asphalt

Page last modified on November 14, 2016

U.S. Department of Transportation
Federal Highway Administration
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Center for Accelerating Innovation

- CAI Home
- Every Day Counts
- STIC Network
- AID Demonstration
- Resources

Safety Edge℠

Pavement edge drop-off on highways has been linked to many serious crashes, including fatal collisions. To mitigate vertical drop-offs, FHWA advocates installing the Safety Edge℠ on pavements during paving or resurfacing projects. This technology allows drivers who drift off highways to return to the pavement safely.

Roadway departures account for over half of all fatal crashes. Not all of these crashes involve speeders and drunk drivers. Some could have been easily prevented if a vertical pavement edge drop-off had not been present.

Many of these tragedies might have been prevented by a cutting-edge technology known as the Safety Edge℠. This simple, inexpensive solution is a focus of the FHWA's *Every Day Counts* program.

Pavement Edge Drop-offs

Drop-offs occur when there are height differences between a paved road and the adjacent graded material. Conventional paving techniques result in vertical or nearly vertical pavement edges, which can cause safety concerns when they are exposed.

National crash data is lacking on edge drop-off issues, but the existing data is compelling. In Iowa, pavement edges may have contributed to as many as 18% of rural run-off road crashes on paved roads with unpaved shoulders during 2002-2004. In Missouri, that percentage was nearly 25%. These statistics were strong motivation for the FHWA's ground-breaking Safety Edge℠ initiative.

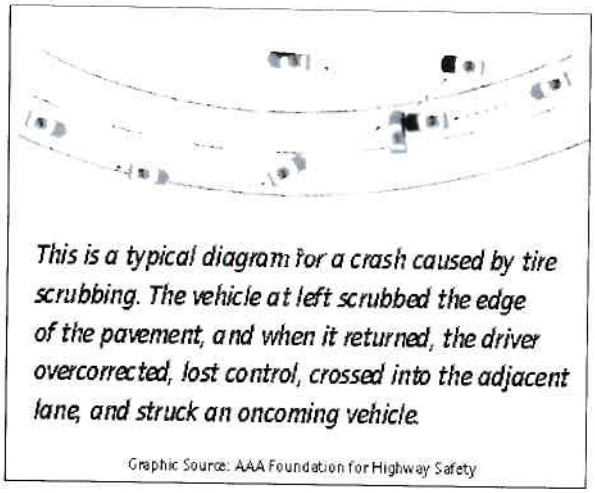
Why Vehicles Leave the Road

Drivers leave the paved road for many reasons. Some may need to avoid a drunk driver or a roadway obstruction. Others are drowsy or distracted by a phone call, a text message, a GPS device, or a passenger. It is particularly easy to leave the paved road when visibility is low.

Returning to the paved road can be challenging when vertical edge drop-offs are present. A driver who doesn't slow down before attempting to steer back onto the pavement can easily lose control of the car. One State found that drop-off crashes are four times as likely to include a fatality than other types of crashes on similar roads.

The Safety Edge℠ Solution

The Safety Edge℠ is an uncomplicated and effective solution to mitigate pavement edge-related crashes. When done correctly, simply shaping the edge of the pavement to 30 degrees can eliminate the problem of vertical drop-off. Research has shown this "shape is considered conservative in that the transition from on-roadway surface to shoulder and back is so smooth it defies assignment of any degree of severity, except when the elevation change from pavement to shoulder causes a noticeable tilt in the vehicle."



This is a typical diagram for a crash caused by tire scrubbing. The vehicle at left scrubbed the edge of the pavement, and when it returned, the driver overcorrected, lost control, crossed into the adjacent lane, and struck an oncoming vehicle.

Graphic Source: AAA Foundation for Highway Safety

The Safety Edge℠ provides a strong, durable transition for all vehicles that are particularly vulnerable, such as smaller, lighter cars or motorcycles. Even at relatively high speeds, vehicles can return to the paved road smoothly and easily.

As with conventional paving, the graded material adjacent to the Safety Edge℠ should be brought flush with the top of the pavement following paving. The Safety Edge℠ concept is that when drop-offs recur, they will not be vertical, but a shape that will not induce tire scrubbing.

Avoiding Tire Scrubbing

Without the Safety Edge, a vertical or near-vertical pavement edge can become exposed. Attempts to return to the road can create "tire scrubbing" as the tire rubs intensely against the vertical edge, causing friction between the wheel and the pavement.

If the driver overcompensates by steering too hard, the vehicle can fishtail, swerve into another lane, or go off the road entirely. The vehicle may roll over or be thrown into oncoming traffic.

Inexperienced drivers are not the only victims of tire scrubbing. Smaller, lighter vehicles have a harder time climbing a steep pavement edge. At high speeds, the climb is particularly dangerous.

Whereas a vertical drop-off of 2.5 inches or greater has been shown to problematic at speeds of 55-60 mph, drop-offs of up to 5 inches with the Safety Edge℠ are traversable at these speeds.

Added Benefits to the Safety Edge℠

The Safety Edge℠ also improves density at the pavement edge, which makes the pavement more durable. Less frequent road maintenance may be needed as edge raveling is reduced.

The Safety Edge℠ is also easy to install. A commercially available shoe can be mounted on asphalt resurfacing equipment. An attachment acts as a screed extension. As the asphalt is extruded, it confines the asphalt into the desired 30 degree shape.

Although generic devices that provide a 30-degree angled shape can also be used, they typically only cut the pavement into the correct angle, but do not consolidate the asphalt. This leaves the edge more open to breaking off.

The Safety Edge℠ is inexpensive to install. Typically less than 1% additional asphalt is required, since the Safety Edge℠ technology compacts the loose asphalt that would otherwise crumble.

The Safety Edge℠ is also recommended for concrete pavements where the edge is adjacent to an unpaved surface. This may call for other considerations, including an increase inmaterials.

The Safety Edge℠ Challenge

The Safety Edge℠ is a proven solution that requires minimal cost and time. By including the Safety Edge℠ detail while paving, this countermeasure can be implemented system-wide at a very low cost. FHWA's goal is to accelerate the implementation of the Safety Edge℠ technology, so that more lives can be saved.

The FHWA has joined with state and local agencies in 20 states to sponsor or initiate project demonstrations installing this technology. Working together with State partners, contractors, equipment manufacturers, and the industry on this 21st century initiative, we can prevent the tragedy of pavement edge drop-offs.

GOVERNMENT OF THE
UNITED STATES VIRGIN ISLANDS

DEPARTMENT OF PROPERTY AND PROCUREMENT
#3274 ESTATE RICHMOND
CHRISTIANSTED, ST. CROIX, U.S. VIRGIN ISLANDS 00820-4241

DATE: **February. 22, 2017**

SUBJECT: **IFB008DPWC17 (C) East Scenic Road Phase II Pavement Preservation and Drainage Improvement St. Croix District, Pre BID at 10:00am**

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