



# Wisconsin Department of Transportation

April 8, 2015

## Division of Transportation Systems Development

Bureau of Project Development  
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### NOTICE TO ALL CONTRACTORS:

**Proposal #31: 7560-06-62**  
**Blair - Merrilan**  
**USH 53 – East County Line**  
**STH 95**  
**Trempealeau County**

**7560-06-70 WISC 2015 197**  
**Blair - Merrilan**  
**USH 53 – East County Line**  
**STH 95**  
**Trempealeau County**

### Letting of April 14, 2015

This is Addendum No. 1, which provides for the following:

#### Special Provisions

Revised Special Provisions	
Article No.	Description
3	Prosecution and Progress
5	Holiday Work Restrictions
30	Cold-In-Place Recycling (CIR) Pavement Partial Depth, Item SPV.0180.01; Asphalt Stabilizing Agent Item SPV.0195.01.

#### Other

Proposal Cover Sheet: Both projects had spelling errors in the Project Description. Both project descriptions are revised to the following:

Blair – Merrilan  
USH 53 to East County Line

Revise the contract time for completion from 100 working days to a completion date of September 4, 2015.

The responsibility for notifying potential subcontractors and suppliers of these changes remains with the prime contractor.

Sincerely,

*Mike Coleman*

Proposal Development Specialist  
Proposal Management Section

**ADDENDUM NO. 1**  
**7560-06-62, 7560-06-70**  
**April 1, 2015**

**Special Provisions**

**3. Prosecution and Progress**

*Remove the last 3 paragraphs.*

**5. Holiday Restrictions**

*Add the following holiday restriction:*

From noon Friday, September 4, 2015 to 6:00 AM Tuesday, September 8, 2015 for Labor Day.

**30. Cold-In-Place Recycling (CIR) Pavement Partial Depth, Item SPV.0180.01; Asphalt Stabilizing Agent Item SPV.0195.01.**

*Remove the entire article language and replace with the following:*

**A Description**

- (1) This work consists of the partial depth milling, crushing, and screening (as necessary) of the existing HMA pavement to the width and depth specified on the plans. The processed material shall be blended with engineered emulsified or foamed asphalt stabilizing agent, water, and other additives as necessary, and required by the mix design, for placement and compaction of this mixture in accordance with the plans and specifications.

**B Materials**

**B.1 Reclaimed Asphalt Pavement (RAP) Material**

- (1) The RAP shall be milled from the existing roadway and processed in-place.
- (2) The RAP shall be free of contamination of base material, shoulder material, concrete, silt, clay, or other deleterious materials.
- (3) Rubberized crack filler, pavement markers, loop wires, fabric, or other materials shall be removed as observed from the roadway during the recycling process. Any residual materials shall be appropriately sized and homogenously blended with the RAP.
- (4) The milled and processed material shall conform to the following gradation prior to addition of the stabilizing agent:

<u>Sieve Size</u>	<u>Percent Passing</u>
1 ½" (37.5 mm)	100
1"	95 to 100

**B.2 Stabilizing Agent**

- (1) The asphalt stabilizing agent shall be the contractor's option of:
  - A. Foamed asphalt
  - B. Emulsion

### **B.2.1 Foamed Asphalt**

- (1) Foamed asphalt shall be produced with a performance graded asphalt binder; without polymer modification; in accordance with Standard Specification 455.
- (2) Asphalt binder performance grade for foamed asphalt shall be PG 46-34 or PG 52-34
- (3) Asphalt binder shall be sufficiently heated to meet the mix design expansion and half-life criteria; not to exceed 375° F.
- (4) Asphalt binder shall produce asphalt foam with a minimum expansion ratio of 8 and half-life of no less than 6 seconds.

### **B.2.2 Emulsion**

- (1) Emulsion type shall be determined by the mix design.

### **B.2.3 Water**

- (1) Water may be added to the RAP at the milling head and/or in a mixing chamber.
- (2) Water added to the RAP, used for foaming asphalt, or incorporated with the asphalt emulsion shall meet the requirements of Standard Specification 501.2.4.

### **B.3 Mixture Design**

- (1) The contractor will be responsible for obtaining milled samples and/or cores for the project mix design.
- (2) Develop and submit a material sampling plan to the engineer; for review with and approval by the Bureau of Technical Services Materials Management Section; 5 business days prior to obtaining milled and/or cored samples.
- (3) Material sampling prior to receipt of the engineers notice to proceed shall require submittal and approval of an Application/Permit to Work on Highway Right-of-Way (DT1812).
- (4) During material sampling operations; contractor insurance will be as specified in section 107 of the Standard Specifications; traffic control requirements will be as specified in sections 107 and 643 of the Standard Specifications and in the contract special provisions.
- (5) Develop and submit a Job Mix Formula (JMF) for approval 10 business days prior to the start of the CIR operation. The JMF will be developed according to the applicable portions of Mix Design Method 1559, as described in WisDOT CMM 8.65; and conforming to the requirements of Table B.3. The JMF will be submitted to the engineer for review with and approval by the Bureau of Technical Services Materials Management Section.

(6)

**Table B.3 – Minimum Mix Design Requirements**

	<b>Test Method</b>	<b>Specification</b>	<b>Criteria</b>	
<b>Mix Design Requirements for All Stabilizing Agents</b>	Gradation of RAP (Sieve Analysis of Aggregates)	WisDOT Mix Design Method 1559; CMM 8-65.5	See Section B.1.(4)	
	Bulk Specific Gravity of Compacted Samples		Report Only; Ndes=30	
	Maximum Theoretical Specific Gravity		Report Only	
	% Air Voids in Compacted Dense and Open Bituminous Paving Mixtures		Report Only	
	Tensile Strength (Resistance of Compacted Mixture to Moisture)		Dry, psi Wet (conditioned), psi Ratio (TSR), %	Minimum 45 Minimum 30 Minimum 0.70
	RAP Coating Test			
	Minimum Virgin Asphalt Content			1.5%
<b>Mix Design Requirements for Foamed Asphalt</b>	Foamed Asphalt Expansion Ratio		Minimum 8.0 Times	
	Foamed Asphalt Half-life		Minimum 6.0 Seconds	
<b>Mix Design Requirements for Emulsified Asphalt</b>	Emulsion sieve test, % of sample weight	AASHTO T 59(1)	Maximum 0.1	
	Emulsion Residue by Distillation, %	AASHTO T 59 (1)	Minimum 60	
	Emulsion Distillation Penetration, 25°C, 100 g, 5s	AASHTO T 49	Minimum 75 Maximum 200	
	Maximum Emulsified Asphalt Temperature		Report Only	

(1) Modify AASHTO T 59 procedure – distillation temperature of 175°C ± 5°C with a 20 minute hold.

- (7) The mix design JMF shall be the baseline measure for the rate of stabilizing agent application and water blended with the RAP to construct the CIR mixture. The mix design shall indicate the allowable tolerance for field adjustments for the stabilizing agent and/or water so as not to jeopardize the performance of the mix in regards to Table B.3, but allow the contractor to adjust the mix in response to field conditions.
- (8) The mix design report shall contain the following minimum information:
- Gradation of RAP
  - Density, maximum specific gravity, air void content, indirect dry tensile strength, indirect wet (conditioned) tensile strength, and tensile strength ratio at each recycling agent content iteration (minimum of 4; inclusive of recommended moisture and stabilizing contents) and at the recommended moisture and stabilizing agent contents
  - Recommended water content range as a percentage of dry RAP
  - Optimum stabilizing agent content as a percentage of dry RAP
  - Stabilizing agent designation, PG grading of asphalt binder if applicable, supplier name and location, emulsified asphalt residue asphalt content if applicable, and certificates of compliance
  - Application means of recycling agent
  - RAP coating test results for emulsified asphalt recycling agent
  - Allowable tolerances for field adjustments for stabilizing agent and/or water.

## **B.4 Quality Management Program**

### **B.4.1 Quality Control Plan**

- (1) Submit a comprehensive written quality control plan to the engineer no later than 10 business days before beginning CIR activities. Construct the project as the plan provides.
- (2) Do not change the quality control plan without the engineer's review and acceptance. Update the plan with changes as they become effective. Provide a current copy of the plan to the engineer and post in the contractor's laboratory as changes are adopted. Ensure that the plan provides the following elements:
1. An organizational chart with names, telephone numbers, current certifications and/or titles, and roles and responsibilities of QC personnel.
  2. The process used to disseminate QC information and corrective action efforts to the appropriate persons. Include a list of recipients, the communication process that will be used, and action time frames.
  3. A list of suppliers for all stabilizing agents.
  4. A list of source locations for all water.
  5. An outline for resolving a process control problem. Include responsible personnel, required documentation, and appropriate communication steps.
  6. Location of the QC laboratory, retained sample storage, and other documentation.
  7. A summary of locations or quantities, selected randomly using ASTM Method D3665, to be tested under this provision.

### **B.4.2 Personnel**

- (1) Provide HTCP Nuclear Density Technician I, or ACT certified technician, for performance of field density and field moisture content testing.
- (2) If an ACT is performing sampling or testing, a certified technician must coordinate and take responsibility for the work an ACT performs. Have a certified technician ensure that all sampling and testing is performed correctly, analyze test results, and post resulting data. No more than one ACT can work under a single certified technician.

### **B.4.3 Equipment**

- (1) Furnish the necessary equipment and supplies for performing quality control testing. Ensure that all testing equipment conforms to the equipment specifications applicable to the required testing methods. The engineer may inspect the measuring and testing devices to confirm both calibration and condition. Calibrate all testing equipment according to the CMM and applicable AASHTO and/or ASTM specifications and maintain a calibration record at the laboratory.
- (2) Furnish nuclear gauges from the department's approved product list at:  
<http://www.dot.wisconsin.gov/business/engserv/approvedprod.htm>
- (3) Ensure that the nuclear gauge manufacturer or an approved calibration service calibrates the gauge the same calendar year it is used on the project. Retain a copy of the calibration certificate with the gauge.
- (4) Conform to ASTM D 6938 and CMM 8.15 for density testing and gauge monitoring methods.

### **B.4.4 Quality Control (QC) Testing**

- (1) Roadway production lots will be defined as 4000 lane feet. Each roadway production lot will consist of two- 2000 lane feet sublots.
- (2) Roadway samples shall be taken at a minimum frequency of 1 per lot of production.
- (3) Samples shall be taken representative of the full recycled depth, immediately prior to application of the stabilizing agent.
- (4) For each roadway sample report the gradation of material, determined in accordance with AASTHO T27, for the Number 4 (4.75mm) sieve and larger.
- (5) Report stabilizing agent foaming properties, if applicable, (i.e. half life and expansion ratio) at a minimum frequency of 1 per lot of production.
- (6) Conduct and report density testing at a minimum frequency of 3 random tests per subplot.
- (7) Conduct and report mill depth checks at a minimum frequency of 1 per subplot.
- (8) Report stabilizing agent temperature and application rate at a minimum frequency of 1 per subplot.
- (9) The contactor shall provide a Daily Inspection Report to the engineer summarizing the: daily beginning and ending stations, applicable mix design, subplot test (mill depth check, density test, stabilizing agent temperature and application rate) locations and values, lot roadway sample locations, and any adjustments to the application rate of the stabilizing agent or water.
- (10) If at any time during production, stabilizing agent adjustments for mixing and placement exceed the allowable limits defined in B.3.(6) or reduce the stabilizing agent application rate below the 1.5% mix design minimum specified in Table B.3, based on a single test or meter adjustment, from the Job Mix Formula (JMF) value, re-evaluation of the entire process must be completed. Approval by the engineer granted before production can resume.

### **B.4.5 Department Testing**

#### **B.4.5.1 General**

- (1) The department will conduct verification testing to validate the quality of the product and independent assurance testing to evaluate the sampling and testing. The department will provide the contractor with a listing of names and telephone numbers of all QV and IA personnel for the

project, and provide test results to the contractor within 5 business days after the department obtains the sample.

#### **B.4.5.2 Quality Verification (QV) Testing**

- (1) The department will have a technician, or ACT working under a technician, perform QV sampling and testing. Department verification testing personnel must meet the same certification level requirements specified in B.4.2 for contractor testing personnel for each test result being verified. The department will notify the contractor before sampling so the contractor can observe QV sampling.
- (2) The department will conduct QV tests at the minimum frequency of 10% of the required QC tests.
- (3) The department will locate gradation, mill depth check, roadway sample, and density test samples, at locations independent of the contractor's QC work, collecting one sample at each QV location. The department will split each QV sample, test half for QV, and retain the remaining half for 7 calendar days.
- (4) The department will conduct QV tests in a separate laboratory and with separate equipment from the contractor's QC tests. The department will use the same methods specified for QC testing.
- (5) The department will assess QV results by comparing to the appropriate specification limits. If QV test results conform to this special provision, the department will take no further action. If QV test results are nonconforming, re-evaluation of the entire process must be completed before production can resume.
- (6) The department reserves the right to adjust the rate of the asphalt stabilizing agent at any time. The department will accept any risk to the CIR layer associated any adjustments made by the department.

#### **B.4.5.3 Independent Assurance (IA)**

- (1) Independence assurance is unbiased testing the department performs to evaluate the department's QV and the contractor's QC sampling and testing, including personnel qualifications, procedures, and equipment. The department will perform an IA review according to the department's independent assurance program. That review may include one or more of the following:
  1. Split sample testing.
  2. Proficiency sample testing.
  3. Witnessing sampling and testing.
  4. Test equipment calibration checks.
  5. Requesting that testing personnel perform additional sampling and testing.
- (2) If the department identifies a deficiency, and after further investigation confirms it, correct that deficiency. If the contractor does not correct or fails to cooperate in resolving identified deficiencies, the engineer may suspend placement until action is taken. Resolve disputes as specified in B.4.5.4.

#### **B.4.5.4 Dispute Resolution**

- (1) The engineer and contractor should make every effort to avoid conflict. If a dispute between some aspect of the contractor's and the engineer's testing program does occur, seek a solution mutually agreeable to the project personnel. The department and contractor shall review the data, examine data reduction and analysis methods, evaluate sampling and testing methods/procedures, and perform additional testing. Use ASTM E 178 to evaluate potential statistically outlying data.

- (2) Production test results, and results from other process control testing, may be considered when resolving a dispute.
- (3) If project personnel cannot resolve a dispute, and the dispute affects payment or could result in incorporating non-conforming product or work, the department will use third party testing to resolve the dispute. The department's central office laboratory, or a mutually agreed on independent testing laboratory, will provide this testing. The engineer and contractor will abide by the results of the third party tests. The party in error will pay service charges incurred for testing by an independent laboratory. The department may use third party test results to evaluate the quality of questionable materials and determine the appropriate payment. The department may reject material or otherwise determine the final disposition of nonconforming material as specified in standard spec 106.5.

## **C Construction**

### **C.1 General**

- (1) Unless the contract provides otherwise, keep the road open to traffic during construction.
- (2) Perform CIR operations; only between the dates of May 1 and October 1; when the air temperature approximately 3 feet above grade, in shade, and away from artificial heat sources is above 50°F and when the nighttime ambient air temperature is above 45°F the night prior and following; unless approved otherwise by the engineer.
- (3) Do not perform CIR operations during inclement weather; such as rain or fog; that will not allow proper mixing, placing, and/or compacting of the mixture.
- (4) CIR operations and recycled pavement curing shall be completed to allow adequate time for placement of surfacing in accordance with calendar requirements of Standard Specification section 450.3.2.1.

### **C.2 Equipment**

- (1) Equipment used for CIR shall be subject to approval by the engineer.
- (2) Tankers supplying hot stabilizing agent components shall be equipped to constantly monitor temperature within the tank.

#### **C.2.1 Milling Machine**

- (1) Milling units; not inclusive of pre-mill/wedge-cut milling units; shall be capable of milling the existing pavement full lane width to the depth shown on the plans, specified in the contract or directed by the engineer, in a single pass.
- (2) The units shall be equipped with automatic depth control, shall maintain constant cutting depth and width, uniform grade, and uniform slope.
- (3) For processes not incorporating additional screening, sizing, or crushing; the milling unit shall be capable of producing RAP sized as specified in B.1.
- (4) Use of a heating device to soften the pavement is not permitted.

#### **C.2.2 Screening, Crushing, and Sizing Equipment**

- (1) Processes requiring additional screening, sizing, or crushing, shall include a unit with a closed circuit system capable of continuously returning oversized material to the crusher until all milled material entering the screening, crushing, or sizing equipment meets the gradation requirements of section B.1.

#### **C.2.3 Mixing Unit**

- (1) Processed RAP shall be mixed with the stabilizing agent and water in a mixing unit; defined as the milling machine cutter housing, a separate mixing chamber, or a pugmill.
- (2) The asphalt stabilizing agent shall be applied; using a computer controlled additive system; uniformly at the predetermined application rate. The metering of the stabilizing agent must be monitored through a calibrated pump providing a continuous readout of quantities.
- (3) The additive system shall contain separate pumping systems for adding stabilizing agent and water. Each system shall have an inspection or test nozzle for stabilizing agent and/or water sampling.
- (4) The system shall be capable of producing a uniformly mixed homogeneous recycled pavement mixture.

#### **C.2.4 Paving Equipment**

- (1) The placement and shaping of the recycled pavement mixture shall be completed using a self-propelled paver or screed integral to the recycling equipment meeting the requirements of Standard Specification section 450.3.1.4; revised to exclude the requirement of an activated screed or strike-off assembly.
- (2) The screed shall not be heated.
- (3) If utilizing a self-propelled paver, the material shall be transferred directly into the paver hopper from the recycling equipment or with a pick-up device. When a pick-up device is used, the entire windrow shall be removed from the milled surface and transferred to the paver hopper.

#### **C.2.5 Compaction Equipment**

- (1) Compaction equipment shall be self-propelled and meet the requirements of Standard Specification 450.3.1.5
- (2) The number, weight, and types of rollers shall be as necessary to achieve the specified compaction.

### **C.3 Constructing CIR**

#### **C.3.1 Preparation**

- (1) After any contract required surface milling, and immediately prior to commencing CIR operations, remove from the roadway, and up to one inch below the milled surface, any vegetation, standing water, loose crack filler, and any other deleterious materials.
- (2) Inspect the pavement surface, after any contract required surface milling, for areas of yielding subgrade. Yielding areas will be repaired prior to CIR operations and paid for in accordance with the Prepare Foundation for CIR Pavement SPV item.
- (3) Blade the existing base aggregate roadway shoulders away from the asphaltic surface edge to minimize contamination of the CIR pavement.

#### **C.3.2 Processing and Placement of Recycled Pavement Mixture**

- (1) Mill the existing pavement to the required depth and width indicated on the plans.
- (2) Further process the milled RAP material as necessary by crushing, screening, and/or sizing to the gradation requirements of B.1.
- (3) Blend the RAP material with the mix design specified proportions of stabilizing agent and water; produce a uniform and homogeneous recycled mixture.

- (4) Spread the recycled mixture to the grade, elevations, and slopes specified on the plans; avoiding tearing or scarring of the recycled pavement surface.
- (5) Ensure proper material transfer, handling, and spreading to prevent particle segregation.
- (6) Longitudinal joints between successive CIR operations shall be overlapped a minimum of 3 inches. Transverse joints between successive CIR operations shall be overlapped a minimum of 2 feet.

#### **C.4 Compaction**

##### **C.4.1 Control Strip Construction**

- (1) On the first day of production, construct a control strip to identify the target wet density for the CIR layer. The control strip construction and density testing will occur under the direct observation and/or assistance of the department QV personnel.
- (2) Unless the Engineer approves otherwise, construct control strips to a minimum dimension of 500 feet long and one full lane width.
- (3) Completed control strips may remain in-place to be incorporated into the final roadway cross-section.
- (4) Construct additional control strips, at a minimum, when:
  1. The CIR layer thickness changes in excess of 2.0 inches.
  2. The percent of target density is less than 90% or exceeds 105.0%; and is outside the range of the 10 random measurements defining the control strip; on three consecutive sublots.
- (5) Construct control strips using equipment and methods representative of the operations to be used for constructing the CIR layer.
- (6) After compacting the control strip with a minimum of 2 passes, mark and take density measurements at 3 random locations, at least 1 ½ feet from the edge of the CIR layer. Subsequent density measurements will be taken at the same 3 locations.
- (7) After each subsequent pass of compaction equipment over the entirety of the control strip, take density measurements at the 3 marked locations. Continue compacting and testing until the increase in density measurements is less than 2.0 lb/ft<sup>3</sup>, or the density measurements begin to decrease.
- (8) Upon completion of control strip compaction, take 10 randomly located density measurements within the limits of the control strip, at least 1 ½ feet from the edge of the base. The final measurements recorded at the 3 locations under article paragraph (6) of this section may be included as 3 of the 10 measurements. Average the 10 measurements to obtain the control strip target density.

##### **C.4.2 Compaction Requirements**

- (1) Compact the CIR layer to a required density of 93% of the target density.

##### **C.5 Surface Requirements**

- (1) Test the pavement surface at regular intervals, and engineer selected locations, using a 10-foot straightedge or other engineer specified device.

- (2) The engineer may direct the repair of surface deviations greater than 1/2 inch between two surface contact points. High points shall be corrected by reworking, rerolling, trimming, milling, or grinding. Depressions may be corrected by reworking or have a tack coat applied and be filled with HMA immediately prior to placement of the surface treatment.

### **C.6 Maintaining the Work**

- (1) After compaction is complete, the contractor will determine when the CIR is stable to open to traffic.
- (2) After opening to traffic, and prior to placing a surface treatment, the surface of the recycled pavement shall be maintained in a condition suitable for safe movement of traffic.
- (3) The recycled pavement surface shall be protected and maintained from standing water, deleterious substances, and/or other damage.
- (4) Any damage to the recycled pavement shall be repaired by the contractor prior to placement of the upper layer at no additional cost to the department; unless otherwise specified in the "Preparation of Foundation for HMA Upper Layer" SPV item.

### **C.9 Curing and Surfacing**

#### **C.9.1 Curing**

- (1) Application of a surface treatment will not be allowed until the moisture content of the CIR layer is not more than 2.0%.
- (2) If the moisture content of the CIR layer does not reduce to 2.0%; the surface treatment may be applied after the change in moisture content is less than 0.10 percentage points for three consecutive calendar days.
- (3) The moisture content shall be determined from a sample retrieved over the full-depth of the CIR layer by weighting and drying to a constant weight using an oven at  $230^{\circ} \pm 9^{\circ}\text{F}$ .

#### **C.9.2 Tack Coat**

- (1) The surface shall be prepared and tack coat applied meeting the requirements of Standard Specification section 455.3.2.
- (2) Minimum tack coat application rate shall be 0.05 gal/SY
- (3) A hot asphaltic cement tack coat shall not be used.

#### **C.9.3 Surfacing**

- (1) Surfacing materials, equipment, and construction methods shall be in accordance with the applicable sections of the Standard Specifications or contract special provisions.

### **D Measurement**

- (1) The department will measure the Asphalt Stabilizing Agent incorporated into the work by the ton; as metered through a calibrated pump, or through delivered ticket quantity.
- (2) The department will measure the Cold-In-Place (CIR) Pavement Partial Depth bid item as acceptably completed by the Square Yard (SY).

### **E Payment**

- (1) The department will pay for the measured quantities at the contract unit price under the following bid item:

ITEM NUMBER	DESCRIPTION	UNIT
SPV.0195.01	Asphalt Stabilizing Agent	Ton
SPV.0180.01	Cold-In-Place Recycling (CIR) Pavement Partial Depth	SY

- (2) Payment is full compensation for measured quantities as specified above; all material including mixing and milling water; equipment necessary for milling and sizing, mixing, paving, compacting the completed CIR; and for furnishing all labor, tools, and incidentals necessary to the conduct mix design; including sampling and sampling traffic control; mill the existing pavement for recycling, size the milled RAP, inject and mix the RAP with the stabilizing agent, place or pave, compact, and maintain the completed CIR.
- (3) Preparation work and repair of yielding areas will be paid for under the Prepare Foundation for CIR Pavement and Prepare Foundation for HMA Upper Layer SPV items.
- (4) Removing or blading away of the adjacent shoulder material will be paid for under the Standard Specifications Shaping Shoulders (305.0500).
- (5) Surfacing treatments, including tack coat, will be constructed and paid for under the applicable specifications and contract items.

END OF ADDENDUM