



Hennepin County Transportation Department

ADDENDUM

**TO PLANS, SPECIFICATIONS AND SPECIAL PROVISIONS FOR
Cold Inplace Recycling And Overlay, Culvert Replacement And Striping**

HENNEPIN COUNTY TRANSPORTATION DEPARTMENT

(To be opened Tuesday, March 26, 2019 at 2:00 P.M.)

ADDENDUM NO. 2

CSAH 50 & CSAH 10; C.P. 183302

NOTICE TO ALL BIDDERS:

This Addendum shall be attached to the Contract Documents and shall be included as part of said Contract Documents. Items herein shall take precedence over any clauses which they modify in the Contract Documents or portions of plans which they modify or supplement.

PROPOSAL

1. S-59 (2390) COLD-IN-PLACE RECYCLED (CIR) BITUMINOUS AND COLD CENTRAL PLANT RECYCLING (CCPR) BITUMINOUS – **Remove and Replace** with the entire section noted as S-59 in Attachment A.

NDH:jj
March 21, 2019
Attachment(s)

Receipt of this addendum must be acknowledged in accordance with the provisions of 1210 of the specifications.

Attachment A

S-59 (2390) COLD-IN-PLACE RECYCLED (CIR) BITUMINOUS AND COLD CENTRAL PLANT RECYCLING (CCPR) BITUMINOUS – SINGLE UNIT

01/25/19

SP2018-150.1

MnDOT 2390 is deleted and replaced with the following:

2390 COLD-IN-PLACE RECYCLED (CIR) BITUMINOUS AND COLD CENTRAL PLANT RECYCLING (CCPR) BITUMINOUS

The subsections below are designated so an “A” subsection refers to both CIR and CCPR, “B” subsection refers to (CIR), and “C” subsection refers to CCPR, as illustrated here:

2390.1 DESCRIPTION

This specification is applicable for Department mix design only.

A COLD INPLACE RECYCLED BITUMINOUS/COLD CENTRAL PLANT RECYCLING BITUMINOUS (CIR/CCPR)

Bituminous Material for Mixture is the liquid bituminous material added to RAP to produce the CIR/CCPR Mixture.

B COLD INPLACE RECYCLED BITUMINOUS (CIR)

Cold In-Place Recycled (CIR) Bituminous Mixture is the un-compacted mixture of RAP, Bituminous Material for Mixture and other additives.

Construct a Cold In-Place Recycled (CIR) Bituminous layer by:

- (1) Milling the existing bituminous to produce a Recycled Asphalt Pavement (RAP).
- (2) Crushing, screening, and mixing the RAP with a Bituminous Material for Mixture.
- (3) Placing and compacting to produce a CIR layer.

C COLD CENTRAL PLANT RECYCLING BITUMINOUS (CIR/CCPR)

Cold Central Plant Recycled (CCPR) Bituminous Mixture is the un-compacted mixture of RAP, Bituminous Material for Mixture and other additives.

A Cold Central Plant Recycling (CCPR) Bituminous layer is constructed by:

- (1) Milling (if required in the Contract), the existing bituminous to produce a Recycled Asphalt Pavement (RAP), note that CCPR may also be produced from previously milled HMA.
- (2) Crushing, screening, and mixing the RAP with a Bituminous Material for Mixture and haul product to placement destination.
- (3) Placing and compacting to produce a CCPR layer.

2390.2 MATERIALS

A.1 Design Parameters

A CIR/CCPR mix design is recommended to determine the method (Foaming or Emulsion), bituminous grade, and amount of additives needed to construct CIR/CCPR. The mix design criteria for CIR/CCPR is located in the Grading and Base Manual section 5-692.291.

A.2 Design Requirements

Department: Provide mix design requirements. Using Form G&B-408 or similar in the Contract.

Contractor: Meet the following Design Parameters listed on the mix design.

A.3 Gradation

The gradation requirement for RAP is 90 - 100% passing the 1 inch sieve and 98 - 100% passing the 1½ inch sieve.

A.4 Bituminous Material for Mixture3151

Use the type and grade of bituminous material for mixture (liquid bituminous material) designated in the mix design on form G&B-408.

A.5 Cement3101

Rate is determined by specific project mix design.

A.6 Additional Rock

Use additional aggregates, if required on the mix design.

A.7 Water.....3906

2390.3 CONSTRUCTION REQUIREMENTS

A.1 General

All forms and the Grading and Base Manual are available on the Grading and Base Website. Correct and re-test all failing areas.

Before beginning operations, remove vegetation and topsoil adjacent to the surface.

Repair structures damaged by Contractor operations, neglect, or negligence.

Provide water in order to obtain optimum moisture content.

CIR or place CCPR when:

- (1) The atmospheric temperature is 50°F and rising when using emulsions or 60°F and rising when foaming asphalt.
- (2) It is not foggy or rainy.
- (3) Freezing temperatures are not predicted within 48 hours after placement.

Atmospheric temperature and predicted weather requirements are determined by the Engineer.

A.2 Equipment

For foamed asphalt applications, the equipment must:

- (1) Accurately foam bituminous material and uniformly add specified water.
- (2) Provide samples of the foamed bituminous material through a sampling nozzle.

A.3 Milling

Use a self-propelled milling machine with the following characteristics:

- (1) Must have a minimum 6 foot ski or multi point measuring device for milling control.
- (2) Equipped with automatic depth and cross-slope controls
- (3) Ability to maintain a constant cutting depth within ±1/4 inch of plan depth in one pass.

Mill the existing pavement to the plan depth and width.

Process paving fabric encountered during milling operations to meet the following:

- (1) At least 90% must have an area less than 5 square inches and
- (2) None of the pieces may have a dimension greater than 4 inches in any direction.

A.4 Crushing/Sizing Unit

Use a crushing/sizing unit with the following characteristics:

- (1) Ability to crush and size all RAP to the gradation requirement of 2390.2.A.3.
- (2) Equipped with a “closed loop” system that returns oversized materials to the crusher.

2390.3.A.4.a Single Train Crushing and Mixing Unit

In lieu of meeting the equipment requirements of 2390.3.A.4 and 2390.3.A.5, the Contractor may choose to use a single milling, crushing, sizing, and mixing unit with the following characteristics:

- The mill must operate in a down-cut mode, with proven safety device(s), such as a down-pressure monitoring system to ensure the recycler stays in the cut.
- The recycler must be able to crush and size all RAP to the gradation requirements of 2390.2.A.3
- The recycler must be able to thoroughly mix RAP while injecting compaction water and Bituminous Material for Mixture and automatically meter the material within 0.1
- The recycler must have a speed display.
- The recycler can either:
 - Drop the cold mix on the ground, allowing the material to be picked up by a material transfer machine and placed into a paver.
 - Load material on conveyors and place the recycling material directly into the hopper of a paver reducing the risk of material segregation and the premature curing of bituminous material.

A.5 Mixing Unit

Use a pug mill mixing unit with the ability to thoroughly mix the RAP while injecting the Bituminous Material for Mixture and automatically metering it to within 0.1 percent.

A.6a Paver

Use a paver equipped with a 20 foot ski meeting the requirements of 2360.3.B.2.a, “Paver”.

A.6.b Material Transfer Device

If the contractor uses a recycler, which drops cold mix on the ground, use a material transfer device, which picks up material from the ground and places it into a paver.

A.7 Bituminous Material for Mixture Supply Tankers

If foaming is required, equip the tankers with a visible thermometer that measures the temperature of the liquid Bituminous Material for Mixture in the bottom third of the supply tank.

A.8 Rollers

A.8.a Steel Wheeled Rollers

Compact with a steel wheeled roller(s) meeting the requirements of 2360.3.B.2.e(1) equipped with a water spray system.

A.8.b Pneumatic Tired Roller

Compact with a pneumatic tired roller(s) with a minimum weight of 25 tons meeting the requirements of 2360.3.B.2.e(2).

A.9 Bituminous Material for Mixture Parameters

Incorporate the bituminous Material for mixture at the rate designated on the mix design. However, after consultation with the Contractor, the Engineer may direct the Contractor to vary the application rate of Bituminous Material for Mixture compared to the mix design for areas of pulverized bituminous which the Engineer believes are either too rich or too dry.

Maintain bituminous material for foaming within $\pm 10^0$ F of the optimum temperature recommended by the mix design (note that bituminous must also meet expansion ratio and half-life foaming tests). If the mix design does not provide a recommendation, maintain the foamed asphalt temperature between 305⁰ F and 325⁰ F.

A.10 Mixing

Mix the crushed RAP, Bituminous Material for Mixture, and cement into a homogenous mixture. Adjust the water application rate based on mixture consistency, coating, and dispersion of the recycled materials.

A.11 Placement

Do not heat the paver screed. Spread the CIR material in one continuous pass to the plan width in one lift. Ensure that the mix does not segregate. Pave before emulsion breaks.

A.12 Compaction

General

- (1) Correct, at no additional cost to the Department, bumps and dips in the profile greater than 1 inch in 25 feet.
- (2) Do not allow rollers or other construction equipment to remain stationary on CIR/CCPR.
- (3) Do not permit traffic (including construction traffic) on the CIR/CCPR layer, if dimpling or other degradation occurs.
- (4) Use visual observations of check cracking and shoving to prevent over-rolling.
- (5) Compact using the criteria in 2390.3.A.12.a, "Control Strip."
- (6) Within 48 hours of CIR/CCPR, re-compact areas represented by density measurements below 98% of the target density determined from the Control Strip, roll until $\geq 98\%$ density is achieved. Note: Do not over-roll to the point where checking of the surface occurs, also note that some areas may not achieve 98% density due to field conditions.

A.12.a Control Strip

Use a control strip to establish a rolling pattern. The control strip should represent a homogenous roadway section and have the following characteristics:

- (1) Minimum area of 400 square yards and
- (2) Remain in-place and become a part of the completed work.

Use the following to establish a rolling pattern after initial breakdown is complete:

- (1) Randomly select three test points in the control strip and use a nuclear density device (ASTM D2950, in back-scatter mode) to determine a wet density at each point after each finish (steel) roller pass.
- (2) Ensure that the nuclear gauge rests on a flat surface. The density at each point is defined as the average of two readings offset 180 degrees.
- (3) Continue compacting until additional roller coverage does not produce an appreciable increase in density. Provide documentation of the growth curve and maximum target density to the Engineer. Use the target density for the QC/QA process.
- (4) Roll the remainder of that course in accordance with the pattern developed in the control strip for that roller.
- (5) Discontinue and reevaluate the rolling operation (pattern and timing), if surface cracking or checking occurs.

Use this rolling pattern until a new control strip is performed.

If the Contractor is using a single unit CIR machine, record the forward speed during the CIR operation; the Contractor must not exceed the speed used in the control strip for the subsequent CIR operation.

Establish a new rolling pattern by performing a new control strip when there are changes in the CIR/CCPR mixture that cause the original control strip to no longer be representative; changes may include:

- (1) In-place materials variation, including sections with varying thickness, construction history, etc.
- (2) If vehicles leave indents in the compacted surface.
- (3) Changes in RAP gradation
- (4) 98% of Target Density is not achieved on two consecutive QC readings.
- (5) Changes in the application rate of Bituminous Material for Mixture, outside of the mix design tolerance.

A.13 Contractor Quality Control Testing Tests and Rates (QC)

Perform Contractor QC testing and submit all required forms, if required in the Schedule of Materials Control. Submit results to the Engineer electronically within 24 hours of the completion of the tests.

Submit to the Engineer the following items:

- (1) a preliminary Grading and Base Report (G&B-001) (required before work commences),
- (2) a final Grading and Base Report (G&B-001) (required within two weeks of completion of project), and
- (3) a weekly summary report of tests completed and retests of failing materials (G&B-003) (required the first working day of the following week).

Correlate the nuclear gauge's dry measurement density by direct moisture measurement (microwave oven or equivalent).

A.14 Department Quality Assurance (QA)

Perform testing per the Schedule of Materials Control.

A.15 Profile, Curing and Surface Requirements

Maintain the CIR layer in a smooth, compacted condition free of ruts, distortions, potholes, loose aggregate, and to the profile and cross section until the placement of the next layer.

Remove all loose aggregate on the surface immediately prior to placing the next layer.

Repair ruts, potholes, wash-boarding, and other distortions.

A.16 Fog Seal and Bituminous Requirements

Apply a CSS-1h bituminous fog seal per 2355, "Bituminous Fog Seal" at a rate of 0.10 to 0.16 gallons per square yard immediately prior to placing the asphalt pavement.

If required of the Contract, place the next layer of material (HMA, seal coat, etc.):

- (1) No sooner than three calendar days and no later than 14 calendar days after the CIR/CCPR, at any location, has been injected and compacted (note that the 14 day requirement may be extended with concurrence of the Engineer, if large rainfall events hinder the curing of the CIR),
- (2) When the CIR/CCPR surface does not deflect under construction equipment and meets quality compaction per 2105.3.F.2,

- (3) When the CIR/CCPR is capable of meeting the required strength to place and compact the next layer, and the moisture content of the CIR/CCPR does not cause a failure to the next material placement, and
- (4) When the moisture content of the CIR/CCPR is low enough to not migrate into and damage the new surface.

A.17 Hold Point

Any failure to meet a requirement creates a Hold Point, whereby no additional material may be placed until corrective action and passing retest(s) have occurred, or accepted by the Engineer. All additional material placed before corrective action and passing retest(s) occur constitutes Unauthorized Work per 1512.2.

B.1 Equipment - Additional Requirement for CIR

Use self-propelled equipment with the ability to: mill, crush, screen, size, and mix the RAP along with the required recycling agents to produce a uniform homogeneous product.

B.2 Milling - Additional Requirement for CIR

Use a self-propelled milling machine with the following characteristics:

- (1) Minimum milling width of 12.5 feet.

B.3 Mixing Unit - Additional Requirement for CIR

Meter bituminous material for mixture.

B.4 Vane Feeder

If mineral stabilizing agent is required, use a computerized vane feeder capable of uniformly spreading it on the road surface prior to recycling.

B.5 Spreading Cement

- (1) Spread cement using a computerized vane feeder in a manner that minimizes dusting, i.e. do not spread when the wind is strong enough to coat traffic and/or the environment.
- (2) Control the cement content to within ± 0.5 pounds/sy, of the design target.
- (3) Start mixing operations, no longer than $\frac{1}{2}$ hour after cement.

C.1 Equipment - Additional Requirement for CCPR

Use equipment with the ability to: crush, screen, size, and mix the RAP along with the required recycling agents to produce a uniform homogeneous product.

C.2 Placement - Additional Requirement for CCPR

Place material in even lifts no greater than 4 inches in thickness.

2390.4 MEASUREMENT

A CIR / CCPR

Measure the CIR/CCPR layer by the square yard.

B Cement

The Engineer will measure cement by the TON.

C Aggregate Base

The Engineer will measure aggregate base in accordance with 2211, "Aggregate Base."

D Bituminous Material for Mixture

The Engineer will measure bituminous material for mixture in accordance with 2215, "Reclamation."

E Bituminous Material for Fog Seal

The Engineer will measure bituminous material for fog seal in accordance with 2355, "Bituminous Fog Seal."

2390.5 BASIS OF PAYMENT

The Department will pay for the correction of in-situ areas that are unstable through no fault of the Contractor's operations, if directed by the Engineer, per 1402.5, "Extra Work".

The contract unit price for the CIR/CCPR includes the cost of milling, production, testing, placement, occasional variations in bituminous pavement thickness, compacting, removing vegetation and topsoil adjacent to the surface, water, and required and necessary maintenance including cleaning the surface.

The Engineer will pay for cement in accordance with 2215, "Reclamation."

The Engineer will pay for aggregate base in accordance with 2211 per TON.

The Engineer will pay for bituminous material for mixture in accordance with 2215, "Reclamation."

The Engineer will pay for bituminous material for fog seal in accordance with 2355, "Bituminous Fog Seal."

Payment for the CIR/CCPR layer will be made on the basis of the following schedule:

Item No.	Item	Unit
2390.504	Cold-in-Place Recycled/Cold Central Plant Recycling Bituminous	square yard