**Date:** **July 14, 2025**

**To:** **All Proposers**

**Subject:** **Addendum No. 3**
**Consisting of eleven (11) Pages**

**RFP No.:** **Bid 25-05-3688LE**

**Project Name:** **N55(1-2)4**

**Owner:** **Navajo Division of Transportation**

Proposer shall make note of and/or incorporate all changes listed below into the requested Request for Proposal (RFP):

1. Response to questions submitted:

| Question Submitted | Response Provided |
|---|---|
| Is the emulsion on the cold in place recycling emulsion subject to any oil index adjustments? | No. The only index adjustment in the Navajo DOT contract is for diesel fuel. |
| I just want to confirm that the cold recycling is going from sta 915+39.90 to 1351+77.20 and we will be jumping the A section areas? … Any clarification here would be greatly appreciated. | Yes, the CCRAC is to occur the full length of the project from BOP, 915+39.90 to EOP, 1351+77.20. This includes the "A" section areas, so the 3 inches of new HMA asphalt will be milled and cold recycled as well. |
| According the Section 310 of the project specifications, subsection 310.03 item j, the dry tensile strength of the Cold In-place Recycled mix must be a minimum of 70 psi, with a Tensile Strength Ratio (TSR) of 70%. … would be revising Table 310-1 to better reflect a realistic Dry Tensile Strength and TSR value, such as 45 psi and 70%, respectively. | Section 310.03, Table 310-1, Cold In-Place Recycled Asphalt Base Course Mix Design Parameter.<br><br>Revise the "Tensile strength dry" value from **70** psi to **45** psi.<br><br>See attached Section 310 COLD IN-PLACE RECYCLED ASPHALT BASE COURSE, FP-24 specification. |

| | |
|---|---|
| Section 310 does not explicitly state how the lime is to be introduced into the Cold Recycled mix if it is used. If lime is required, will the Owner clarify the manner in which lime must be added? | By use of a pugmill. Reference Section 310.05, Equipment. Subsection (c). Pugmill and proportioning equipment. Provide the following:<br><br>(1) Capable of continuously mixing the milled material with emulsified asphalt, water, lime, and other additives to produce a uniform and homogenous mixture. |
| Will the Owner allow the use of cement additive rather than lime for production of the Cold Recycled Asphalt Base Course? Please note that the updated FHWA Specifications, FP-24, Section 310 allow for the use of cement or lime additive in Cold In-place Recycled Asphalt Base Course (see attached specifications). | The use of Cement is acceptable.<br><br>See attached Section 310 COLD IN-PLACE RECYCLED ASPHALT BASE COURSE, FP-24 specification. |

2. **Contract Book**: The following changes to the subject Contract Book are incorporated via Addendum No. 3.
   a. Section 310 COLD IN-PLACE RECYCLED ASPHALT BASE COURSE. Replace Section 310 from FP-14 and replace with attached Section 310 from FP-24.

**END OF ADDENDUM NO. 3**

Thank you for your interest!

7/16/2025

Ardaniel Begay, Principal Contract Analyst
Project Contact Person

# Section 310. — COLD IN-PLACE RECYCLED ASPHALT BASE COURSE

## Description

**310.01** This work consists of constructing cold in-place recycled asphalt base course with a self-propelled recycling train.

## Material

**310.02** Conform to the following Subsections:

| | |
|---|---|
| Crushed aggregate | 703.06 |
| Engineered emulsion | 702.02(d) |
| Hydraulic cement | 701.01 |
| Lime for asphalt mixtures | 725.03(c) |
| Water for construction | 725.01(c) |

## Construction Requirements

**310.03 Composition of Mix (Job-Mix Formula).** Collect representative samples of the existing pavement to be milled. Replace removed pavement with asphalt concrete conforming to Section 403, Type II or approved cold patch material.

Design a mix according to FLH T 524 and Table 310-1. Submit the JMF and the following for approval 30 days before production:

**(a)** Optimum emulsified asphalt binder content based on total mass of mixture;

**(b)** Source and grade of emulsified asphalt binder;

**(c)** Optimum moisture content for dispersion and compaction based on total mass of mixture;

**(d)** Cement or lime content, if needed;

**(e)** Maximum density for the mixture;

**(f)** Bulk specific gravity for the mixture;

**(g)** Results of tests and applicable charts and graphs;

**(h)** A representative 300-pound sample of pavement, if requested;

**(i)** Three, 1-gallon samples of emulsified asphalt binder, if requested; and

**(j)** A 15-pound sample of cement or lime, if requested.

Start production only after the mix design is approved. Submit a new mix design if there is a change in a material source.

**Table 310-1**
**Cold In-Place Recycled Asphalt Base Course Mix Design Parameters**

| Property | Requirement |
|---|---|
| Indirect tensile strength, AASHTO T 283[1] | |
| Tensile strength dry | 45 psi minimum |
| Tensile strength ratio | 70% minimum |
| Raveling test, ASTM D7196, 4-hour cure at 50 °F, 50% humidity[2] | |
| Average mass loss | 5% maximum |

(1) Follow the modified AASHTO T 283 procedures as indicated in FLH T 524.
(2) Use the listed testing conditions for the raveling test, unless otherwise directed.

**310.04 General.** Establish existing pavement cross-section according to Subsection 152.05. Maintain the established cross-section or construct to proposed cross-section.

Protect manholes, valve covers, and other buried facilities from damage.

Clear, grub, and remove vegetation and debris within the area to be disturbed according to Section 201. Clean the pavement and edge of pavement of loose material, dirt, vegetation, and other deleterious material.

**310.05 Equipment.** Provide a self-propelled recycling train with the following major units:

**(a) Pavement milling machine.** Provide the following:

**(1)** Automatic depth controls to maintain the cutting depth to within ±¼ inch;

**(2)** Automatic system to maintain cross slope;

**(3)** Capable of milling the existing asphalt pavement material to the required depth in a single pass; and

**(4)** 12.5 feet minimum cutter width.

**(b) Crushing unit.** Capable of screening and crushing material to the required size before mixing with emulsified asphalt.

**(c) Pugmill and proportioning equipment.** Provide the following:

**(1)** Capable of continuously mixing the milled material with emulsified asphalt, water, lime, and other additives to produce a uniform and homogenous mixture;

**(2)** Belt scale for continuous weighing of milled and sized material with an interlocked computer controlled liquid metering device that can automatically adjust the flow of asphalt emulsion to the mass of milled material coming into the mixer;

**(3)** Proportioning equipment that can apply emulsified asphalt and water to within ±0.2 percent of the required quantity by mass of milled material;

**(4)** Proportioning equipment with a digital meter for monitoring the flow rate and total milled material, emulsified asphalt, and water applied; and

**(5)** Capable of placing the mixture in a windrow without segregation.

**(d) Paver.** Provide a paver conforming to Subsection 401.05 that can pick up the entire windrow and feeding it into the paver hopper. Do not heat the screed.

**(e) Rollers.** Provide double-drum steel-wheel and pneumatic-tire rollers in sufficient quantity and size to obtain the required density. Provide pneumatic-tire rollers weighing at least 30 tons.

**310.06 Weather Limitations.** Do not start work when fog, precipitation, frost, or temperatures below 35 ºF are anticipated within 24 hours.

Place cold in-place recycled asphalt base on a dry, unfrozen surface when the air temperature in the shade and the road surface temperature are 50 ºF and rising.

**310.07 Production Start-Up Procedures.**

**(a) Preparatory phase meeting.** Conduct a pre-recycling preparatory phase meeting according to Subsection 153.06(a) at least 7 days before the start of recycling operations.

**(b) Control strip.** Provide 7 days' notice before starting production.

Construct a control strip on the project at an approved location. Recycle a control strip that is one lane wide, 1500 feet long, and the designated lift thickness. Use the construction procedures intended for the entire project. Stop production after construction of the control strip until the recycled base and the control strip are evaluated and accepted.

Acquire three random samples of milled material from the control strip after the material has passed through the crushing unit, but before emulsified asphalt is added for Type A compaction. Verify that 100 percent passes the 1½-inch sieve. Take density readings behind each roller pass to determine the roller pattern necessary to achieve the maximum in-place density (break point of compaction curve) according to ASTM D2950. Use the bulk specific gravity value from the mix design as a benchmark for evaluating the maximum in-place density achieved.

Repeat the control strip process until an acceptable control strip is produced. See Subsection 106.01 for the disposition of material in rejected control strips. Accepted control strips may remain in place and will be measured as a part of the completed base course.

Full production may start when a control strip is verified. Provide the CO with the maximum in-place density achieved (Type A compaction), and application rates of the emulsified asphalt, water, and other additives used on the accepted control strip.

Use these start-up procedures when changing construction procedures, resuming production after a termination of production due to unsatisfactory quality according to Subsection 106.04, or starting of a new construction season.

**310.08 Pavement Recycling and Mixing.** Mill the existing pavement to the required depth and width. Reduce oversize particles to a maximum size of 1½ inches.

If cement or lime is required at the milling head or in the pugmill, incorporate cement or hydrated lime slurry to within ±10 percent of the approved application rate. Produce the cement or lime slurry using

water in a slurry production unit equipped with scales and meters accurate to within 0.5 percent by mass. Agitate the transport and feed tanks to provide a consistent and pumpable lime slurry.

Combine milled material with emulsified asphalt, water, and cement or lime at the approved application rates to produce a homogenous and uniformly coated mixture. Maintain the emulsified asphalt temperature within the range recommended by the supplier.

Do not disturb underlying material. Synchronize the recycling rate to allow for continuous operation of recycling train equipment.

Continuously monitor and evaluate the milling, mixing, and placing operations to ensure optimum quality of the recycled asphalt base course. Adjust application rates in coordination with the CO based upon material variations.

**310.09 Spreading, Compacting, and Finishing.**

**(a) Spreading.** Spread and finish the recycled mix to the required cross-section.

**(b) Compacting.** Start compaction within 60 minutes of spreading. Use pneumatic-tire rollers until no displacement is observed. Use steel-wheel rollers, in static or low-amplitude vibratory mode, to achieve final density and eliminate pneumatic-tire roller marks. Do not park or idle rollers on uncompacted material. Compact using the designated type:

**(1) Type A compaction.** Use roller patterns established during the control strip. Compact the recycled mix to obtain a minimum density of 97 percent of the control strip density. Measure in-place density according to ASTM D2950. If an area fails to meet required density, rework and recompact the area.

If application rates of the emulsified asphalt from the approved mix design are changed by more than ±0.2 percent by mass of milled material, or if other material conditions distinctly change, reestablish roller pattern according to Subsection 310.07.

**(2) Type B compaction.** Compact the recycled mix using the following equipment, sequence, and number of roller passes:

*(a)* Four to six roller passes with a double drum, vibratory roller having a mass of at least 5.5 tons and equipped with frequency and amplitude controls.

*(b)* Four to six roller passes with a pneumatic-tire roller having a mass of at least 2000 pounds per wheel and a contact pressure of at least 80 pounds per square inch.

*(c)* Two to four roller passes with a static steel-wheel roller with a pressure of at least 250 pounds per square inch.

Compact the material with approved tampers or compactors along curbs, headers, walls, and places not accessible to the roller.

**(c) Finishing.** Produce a surface that is smooth, dense, and free of ruts, ridges, and loose material. Measure the pavement surface using a 10-foot metal straightedge at right angles and parallel to the centerline. Defective areas are deviations between the surface and the bottom of the straightedge more

than ⅜ inch measured between two contacts of the straightedge or deviations more than ⅜ inch measured at the end of the straightedge.

**(d) Fog seal.** Place a fog seal according to Section 406 on the surface of the recycled asphalt base. Use emulsified asphalt diluted to 50 percent by volume with water and apply it at a rate of 0.05 to 0.15 gallon per square yard. If necessary, place blotter according to Section 406.

**310.10 Construction Joints.**

**(a) Longitudinal joints.** Make longitudinal joints coincide with each change in cross slope. Provide a minimum longitudinal overlap of 6 inches.

**(b) Transverse joints.** At the starting of each day's recycling operations or after extended work stoppages, cut back into the completed work to ensure uniform material and depth across transverse joints.

**310.11 Curing and Maintenance.** Keep traffic and construction equipment off the recycled asphalt base for at least 2 hours after completing compaction and until it is sufficiently stable to withstand raveling, marring, and permanent deformation. Route hauling and other construction equipment uniformly over the full width of the recycled asphalt base to minimize non-uniform compaction.

Maintain the recycled asphalt base to the correct cross-section. Provide additional rolling with a steel-wheel roller to recompact and maintain a dense surface. Use a power broom to remove loose particles. If the recycled asphalt base ravels or loses stability, density, or finish, reprocess and recompact as necessary to restore the strength of the damaged material.

Overlay the recycled asphalt base when the moisture content of the recycled asphalt base is less than 2.5 percent according to AASHTO T 255, but within 14 days after completing finishing operations regardless of moisture content.

**310.12 Acceptance.** See Table 310-2 for sampling, testing, and acceptance requirements.

Blotter material will be evaluated under Subsection 106.03.

Cement and lime will be evaluated under Subsections 106.02 and 106.03.

Emulsified asphalt binder will be evaluated under Subsections 106.03 and 106.04.

Construction of the cold in-place recycled asphalt base course will be evaluated under Subsections 106.02 and 106.04. Type A compaction will be evaluated under Subsection 106.04.

Pavement smoothness will be evaluated under Subsections 106.02 and 106.04.

**Measurement**

**310.13** Measure the Section 310 pay items listed in the bid schedule according to Subsection 109.02.

## Payment

**310.14** The accepted quantities will be paid at the contract price per unit of measurement for the Section 310 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

## Table 310-2
## Sampling, Testing, and Acceptance Requirements

| Material or Product (Subsection) | Type of Acceptance (Subsection) | Characteristic | Category | Test Methods Specifications | Sampling Frequency | Point of Sampling | Split Sample | Reporting Time | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| **Source** | | | | | | | | | |
| Emulsified asphalt (702.02) | Measured & tested for conformance (106.04) | Quality | – | Subsection 702.02 | 1 per type & source of material | Asphalt supplier | Yes | 30 days minimum before production | – |
| **Design** | | | | | | | | | |
| Emulsified asphalt mix design | Measured & tested for conformance (106.04) | All | – | Subsection 310.03 & FLH T 524 | 1 per submitted mix design | Existing roadway | Yes | 30 days minimum before production | For Type A compaction only |
| **Production Start-up (control strip)** | | | | | | | | | |
| Emulsified asphalt mixture | Measured & tested for conformance (106.04) | Gradation | – | AASHTO T 27 | 3 minimum | Before emulsion addition | No | Upon completing test | – |
| | | Bulk specific gravity (density) | – | FLH T 524 | 1 minimum | Loose mix in windrow | " | " | For Type A compaction only |
| | | Density | – | ASTM D2950 & Subsection 310.07 | Subsection 310.07 | In-place after compaction | " | " | " |
| | | Depth of cut | – | – | 3 minimum | Both ends of milling drum | " | " | – |

**Table 310-2 (continued)**
**Sampling, Testing, and Acceptance Requirements**

| Material or Product (Subsection) | Type of Acceptance (Subsection) | Characteristic | Category | Test Methods Specifications | Sampling Frequency | Point of Sampling | Split Sample | Reporting Time | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| **Production** | | | | | | | | | |
| Emulsified asphalt (702.02) | Measured & tested for conformance (106.04) | Bulk specific gravity (density) | – | FLH T 524 | 1 per change in material | Loose mix in windrow | No | Upon completion of test | For Type A compaction only |
| | | Density | – | ASTM D2950 & Subsection 310.07 | 1 per 2000 $yd^2$ | In-place after compaction | " | End of shift | " |
| | | Depth of cut | – | – | 1 per 500 ft | Both ends of milling drum | " | " | – |
| | Process control (153.03) | Gradation | – | AASHTO T 27 | 1 per 3500 $yd^2$ minimum | Before emulsion addition | No | Upon completion of test | – |
| | | Indirect tensile strength(1) | – | FLH T 524 | 1 per 3500 $yd^2$ | " | " | 4 days | " |
| Emulsified asphalt (702.02) | " | Application rates | – | Calculation of yield rate, Subsection 310.08 | 1 per tank load minimum | – | " | " | – |

**Table 310-2 (continued)**
**Sampling, Testing, and Acceptance Requirements**

| Material or Product (Subsection) | Type of Acceptance (Subsection) | Characteristic | Category | Test Methods Specifications | Sampling Frequency | Point of Sampling | Split Sample | Reporting Time | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| **Finished Product** | | | | | | | | | |
| Cold recycled asphalt base | Measured & tested for conformance (106.04) | Surface tolerance | – | Straightedge measurement, Subsection 310.09(c) | Continuously, after compaction | Finished recycled base surface | No | 24 hours | – |

(1) Transport samples immediately to a field material laboratory for indirect tensile strength compaction. Compact within 1 hour of sampling.