Calhoun County
Road Department

"Building A Better County Through Responsive Leadership"

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Invitation for Bids

2024 Countywide HMA Paving

Sealed bids will be received by the Calhoun County Road Department electronically and should be submitted to kparsons@calhouncountymi.gov no later than **12:00 PM EST on Wednesday, February 14th, 2024,** for the paving of multiple roadways in Calhoun County, Michigan.

No pre-bid meeting will be held. Questions about this bid package must be submitted by **Thursday, February 1st, at 12:00 PM** via email to bkernstock@calhouncountymi.gov.

The Calhoun County Road Department reserves the right to split this work between multiple contractors based on the bids that are received, to reject any and all bids, and to make the award in the best interest of the Calhoun County Road Department and Calhoun County.

Kristine Parsons, PE
Director of Engineering

General Provisions & Instructions

Scope of Work

The work covered by this proposal consists of HMA paving and construction of gravel shoulders on multiple segments of roadway at various locations throughout Calhoun County.

All work shall be performed in accordance with the Michigan Department of Transportation's (MDOT) 2020 Standard Specifications for Construction or as modified by these General Provisions and Instructions.

Special Requirements

1. Persons wanting to submit a bid on this project shall submit the forms from Appendix A & Bid Security Requirements. Bid forms should be submitted to the Calhoun County Road Department. After the bid opening, a decision will be made to pursue what is in the best interest of the Calhoun County Road Department and Calhoun County

2. A preconstruction meeting will be held to finalize a progress schedule and to determine execution-administration of the contract. Work on the project shall begin on a date agreed upon with the Calhoun County Road Department and the Calhoun County. The completion date for all work included in this bid package shall be September 13th, 2024. Any projects that are to be chip sealed after skip paving shall be completed by June 3rd, 2024. Work added after the bid opening will not adhere to this deadline.

3. Payment: The contractor shall submit invoices for completed contract items to the Calhoun County Road Department (Erin Cummings). The invoice will be processed and payment for approved contract items (less retainage, if necessary) will be made within thirty (30) calendar days or less of receiving the invoice.

4. The Contractor shall furnish a statement to the Calhoun County Road Department certifying that all subcontractors and suppliers that furnished labor, equipment, and materials for the project have been paid before the final payment on the contract is made.

5. This contract may be extended for three (3) one (1) year extensions by the mutual agreement of both parties. Requests for extension must be emailed to bkernstock@calhouncountymi.gov, by December 1st of the current contract period. Bid prices shall remain firm for the initial contract term. If the Contractor has encountered significant price increases during the current calendar year or contract term, a request to extend may include a proposed price adjustment. The proposed price adjustments and supporting documentation must be emailed with the request to extend. The Calhoun County Road Department will review the proposed price adjustments and

finalize their decision to accept or deny the proposed price adjustments within 30 days of receipt of the extension request.

Questions/Additional Information

Questions regarding this project should be directed to:

Brian Kernstock, PE
Senior Civil Engineer
Calhoun County Road Department
13300 15 Mile Road
Marshall, MI 49068
P: 269.781.9841
BKernstock@calhouncountymi.gov

Appendix A: Bid Security Requirements & Bid Forms

Bid Security

Bid security shall be made payable to the Calhoun County Road Department in an amount equal to 5% of the total bid. The bid security can be cash, certified check, or a bid bond issued by a surety.

The bid security of the successful low bidder will be retained by the Calhoun County Road Department until a contract is executed. The bid security shall be returned to the successful low bidder within ten (10) business days of the date the contract is executed.

The successful low bidder's bid security will be forfeited if the Calhoun County Road Department and the successful low bidder fail to reach agreement on a progress schedule or if the low bidder fails to return an executed contract to the Calhoun County Road Department within ten (10) business days of receiving notice of award.

The bid security of other bidders shall be returned within ten (10) business days of the bid opening.

Bonding

Performance and payment bonds with penal amounts equal to 100% and 50%, respectively, of the amount of the contract are required by law when the bid exceeds $25,000. All subcontractors performing work under this contract are subject to bonding requirements. A bid bond of 5% is required, and performance and payment bonds are required with penal amounts equal to 100% and 50%, respectively, of the amount of the contract. Bonds are to be made payable to the Contractor. Corporate sureties offered for bonds furnished with this contract must be original documents and must appear on the list contained in the Department of Treasury Circular 570, entitled "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and Acceptable Reinsuring Companies".

A. **Bid Bond:** 5% of amount of contract

B. **Performance Bond:** 100% of amount of contract

C. **Payment Bond:** 50% of amount of contract

Bid Sheet

Schedule of Items (Itemized Bid Sheet)

Letting Date: Wednesday, February 14, 2024 12:00 PM

Contract ID: 2024 Countywide
Location:
Description:

Project Number: 2024 Countywide
Estimate Number: 1
Project Type: Miscellaneous
Location: Various Locations in Calhoun County

Project Engineer: Skylar Cudney
Date Created: 1/10/2024
Fed/State #:
Fed Item:
Control Section:

Description:

Instructions to Bidders:

IMPORTANT NOTICE:
If the proposal establishes a maximum price for any of the following work items, and if you bid a price higher than that maximum price, your bid will be considered to have quoted the maximum price and your bid total will be adjusted to reflect that maximum price.

If the proposal provides a specified price for any of the following work items, and if you bid a price higher or lower than that specified price, your bid will be adjusted to reflect that specified price.

If your bid is the lowest accepted bid, and if you refuse to accept the award of the contract due to the change in what you quoted as a maximum or specified price, you will forfeit your proposal guaranty.

Pay Item	Description	Quantity	Units	Unit Price		Bid Amount	
				Dollars	Cts	Dollars	Cts
1100001	Mobilization, Max 10%	1	LSUM				
2040050	Pavt, Rem	100	Syd				
2050010	Embankment, CIP	500	Cyd				
2050041	Subgrade Undercutting, Type II	100	Cyd				
3020001	Aggregate Base	600	Ton				
3050002	HMA Base Crushing and Shaping	15,000	Syd				
3070121	Shld, Cl II	3,840	Ton				
5010005	HMA Surface, Rem	100	Syd				
5010008	Pavt for Butt Joints, Rem	2,780	Syd				
5012024	HMA, 4EL	10,375	Ton				
5012036	HMA, 5EL	2,560	Ton				
8162001	Slope Restoration, Non-Freeway, Type A	5,100	Syd				
8210001	Monument Box	2	Ea				
8210010	Monument Preservation	2	Ea				
				Total Bid:			

Contractor: _____

_____ _____

(Signature) (Date)

PROGRESS CLAUSE

The Owner anticipates that construction can begin no earlier than

- **10 calendar days after award.**

In no case shall any work be commenced prior to receipt of formal notice of award by the Department.

The Contractor shall prepare and submit a detailed progress schedule.

The progress schedule shall include, at minimum, the controlling work items for the completion of the project as well as the planned dates or work days that these work items will be controlling operations. All contract dates including open to traffic, project completion, interim completion and any other controlling dates in the contract, must be included in the progress schedule.

If the bidding Proposal specifies other controlling dates, these shall also be included in the Progress Schedule.

All work shall be conducted during daytime hours. No work on weekends unless pre-approved by the Engineer.

Work must be continuous and progressive.

Butt joints may not be milled more than 7 calendar days in advance of paving. The road shall be fully open to traffic, including shoulder work, within 7 calendar days of paving unless otherwise approved by the Engineer. These time frames are weather dependent.

The following roads will be chip sealed after paving by other forces and shall be completed first:

- 3 ½ Mile Rd from M-66 to 3000 feet North – Athens Township
- 23 Mile Rd from D Drive S to E Drive S – Eckford Township

All roads that are to be chip sealed after paving shall be completed

- **On or before June 3rd, 2024**

All other work shall be completed

- **On or before September 13th, 2024**

After award and prior to the start of work, the Contractor must attend a preconstruction meeting with the Engineer. The Engineer will determine the day, time and place for the preconstruction meeting. The meeting will be conducted after project award and may be rescheduled if there are delays in the award of the project. The named subcontractor(s) for Designated and/or Specialty Items, as shown in the Proposal, should attend the preconstruction meeting if such items materially affect the work schedule.

Liquidated Damages shall be assessed in accordance with Section 108.10 of the 2020 Standard Specifications for Construction.

Project Log
2024 Countywide HMA Paving

PROJECT LOCATION

Project locations will be at various sites throughout Calhoun County. Locations and quantities may vary depending on budgetary constraints. CCRD reserves the right to adjust quantities and locations of all items of work.

The Engineer or Designated Agent will establish the final locations for all items of work.

PROJECT DESCRIPTION

The project proposes to resurface various segments of road throughout Calhoun County with three different treatments. The treatments will consist of skip pave, solid HMA overlay, and crush & shape.

SKIP PAVE ROADS

The following location will be skip paved with 1.5-inches of HMA, 4EL.

23 Mile Rd – HMA Skip 1.5”

Location: D Drive S to E Drive S – Eckford Township

Use the following estimated pay items as directed by the Engineer.

HMA, 4EL .....550 Tons
Shld, Cl II .....175 Tons

The Contractor shall utilize a single lane closure on all skip pave roads utilizing traffic regulators. **Traffic control will not be paid for as a separate item and shall be included in the price of other items.**

Prior to paving, all locations shall be swept of dirt and debris and have a uniform layer of bond coat (tack) applied at a rate of 0.05 to 0.15 gallons per square yard. The bond coat must be given time to cure before the surface is paved.

All skip pave locations shall be resurfaced with HMA between the limits marked by the Engineer or Designated Agent, paid for as *HMA, 4EL*. The application rate shall be 110 pounds per square yard for every inch of HMA that is placed.

3-foot gravel shoulders shall be placed along the new skips within 7 calendar days of paving, paid for as *Shld, Cl II*. All gravel shoulders shall be blended in with the existing back of shoulder or ditch for proper drainage. Shouldering must be completed on a road segment before payment will be issued for any work at that location.

All skip paves will have ends that uniformly taper down to meet the existing HMA. All driveways will have a 2-foot tab paved into the driveway. HMA and concrete driveways shall have a tab that uniformly tapers down to meet the existing driveway surface. Gravel driveways shall have a tab

that will be left a minimum of 1.5-inches thick. The tabs in gravel driveways will be tied back into the existing driveway surface with *Shld, Cl II.*

Any monument boxes located within the paving limits shall be raised with adjustment rings supplied by Calhoun County Road Department. The contractor will be responsible for placing the adjustment ring over the monument box prior to paving. The cost associated with this will be considered incidental to construction.

OVERLAY ROADS

The following roads will be paved with a solid HMA overlay:

H Drive N – HMA 3.0"

Location: Verona Rd to W. Township Line – Marshall Township

This location will be paved with two lifts of HMA. The base will be 1.5-inches of HMA, 4EL and the top will be 1.5-inches of HMA, 5EL.

Use the following estimated pay items as directed by the Engineer.

HMA, 4EL ..... 1,200 Tons
HMA, 5EL ..... 1,200 Tons
Pavt for Butt Joints, Rem ..... 500 Syd
Shld, Cl II ..... 800 Tons

30 Mile Rd – HMA 2.0"

Location: H Drive S to Brembo Driveway – Albion Township

Use the following estimated pay items as directed by the Engineer.

HMA, 4EL ..... 2,000 Tons
Pavt for Butt Joints, Rem ..... 600 Syd
Shld, Cl II ..... 700 Tons

M Drive N – HMA 2.0"

Location: Private Rd to 26 Mile Rd – Clarence Township

Use the following estimated pay items as directed by the Engineer.

HMA, 4EL ..... 750 Tons
Pavt for Butt Joints, Rem ..... 400 Syd
Shld, Cl II ..... 240 Tons

21 Mile Rd – HMA 2.0"

Location: H Drive N to J Drive N – Marengo Township

Use the following estimated pay items as directed by the Engineer.

HMA, 4EL ..... 1,575 Tons

Pavt for Butt Joints, Rem .....480 Syd
Shld, Cl II .....400 Tons

3 ½ Mile Rd – HMA 2.0"

Location: M-66 to 3000 feet North – Athens Township

Use the following estimated pay items as directed by the Engineer.

HMA, 4EL .....900 Tons
Pavt for Butt Joints, Rem .....400 Syd
Shld, Cl II .....325 Tons

15 ½ Mile Rd – HMA 2.0"

Location: Tau Rd to Division Dr – Marshall Township

Use the following estimated pay items as directed by the Engineer.

HMA, 4EL .....400 Tons
Pavt for Butt Joints, Rem .....200 Syd
Shld, Cl II .....100 Tons

15 ½ Mile Rd – HMA 1.5"

Location: Division Dr to B Drive S – Fredonia Township

Use the following estimated pay items as directed by the Engineer.

HMA, 4EL .....1,185 Tons
Pavt for Butt Joints, Rem .....200 Syd
Shld, Cl II .....300 Tons

The Contractor shall utilize a single lane closure on all overlay roads utilizing traffic regulators. **Traffic control will not be paid for as a separate item and shall be included in the price of other items.**

Butt joints will be milled at the beginning and end of each road segment, and at all intersecting roads as marked by the Engineer or Designated Agent. Certain HMA driveways may also have butt joints milled in them. The driveways will then be tied back into the existing roadway using HMA during paving operations. The Engineer or Designated Agent shall be responsible for marking out all milling limits and butt joint locations prior to the work taking place. Butt joints may not be milled more than 7 calendar days in advance of paving, weather permitting. All butt joint work shall be paid for as *Pavt for Butt Joints, Rem.* Any asphalt driveways shall be milled in preparation for paving also paid for as *Pavt for Butt Joints, Rem*.

Prior to paving, all locations shall be swept of dirt and debris and have a uniform layer of bond coat (tack) applied at a rate of 0.05 to 0.15 gallons per square yard. The bond coat must be given time to cure before the surface is paved.

All paving locations shall be resurfaced with HMA between the limits marked by the Engineer or Designated Agent, paid for as *HMA, 4EL* and/or *HMA, 5EL* depending on the location. This

includes paving back into butt joints. The application rate shall be 110 pounds per square yard for every inch of HMA that is placed.

All gravel driveways within the paving limits shall have an HMA tab placed for a distance of 2-feet back in the driveway during paving operations, paid for as *HMA, 4EL* or *HMA, 5EL* HMA driveways that are not milled or cut will be tied into the roadway with a 2-foot HMA tab that tapers back into the driveway.

HMA valley gutter shall be placed in locations where there is potential for water runoff to erode and wash away any proposed shoulder gravel. These locations will be marked out by the Engineer or Designated Agent. This work will be included in the items *HMA, 4EL* and *HMA, 5EL.*

3-foot gravel shoulders shall be placed along all paved segments within 7 calendar days of paving, weather permitting. 23A aggregate shall be used for the gravel shoulders, to be paid for as *Shld, Cl II*. All gravel shoulders shall be blended in with the existing back of shoulder or ditch for proper drainage. Shouldering must be completed on a road segment before payment will be issued for any work at that location.

Any monument boxes located within the paving limits shall be raised with adjustment rings supplied by Calhoun County Road Department. The contractor will be responsible for placing the adjustment ring over the monument box prior to paving. The cost associated with this will be considered incidental to construction.

CRUSH & SHAPE ROAD

The following road will be crushed, shaped, and paved with 3.5" of HMA.

E Drive S – CSC 3.5"

Location: 5 Mile Rd to 6 Mile Rd – Leroy Township

Use the following estimated pay items as directed by the Engineer.

Pavt, Rem .....100 Syd
Embankment, CIP .....500 Syd
Subgrade Undercutting, Type II ..... 100 Cyd
Aggregate Base .....600 Tons
HMA Base Crushing and Shaping .....15,000 Syd
Shld, Cl II .....800 Tons
HMA Surface, Rem .....100 Syd
HMA, 4EL ..... 1,815 Tons
HMA, 5EL .....1,360 Tons
Slope Restoration, Non-Freeway, Type A .....5,100 Syd
Monument Box..... 2 Ea
Monument Preservation ..... 2 Ea

The Contractor shall utilize road closure on crush & shape roads. Traffic regulators must be used during paving and shouldering operations. **Traffic control will not be paid for as a separate item and shall be included in the price of other items.**

The existing roadway will be pulverized and re-graded. This will be paid for as *HMA Base Crushing and Shaping.*

If any unsuitable base material is found during construction, it will be removed and replaced as marked by the Engineer of Designated Agent. This will be paid for as *Subgrade Undercutting, Type II.*

21AA aggregate will be added in superelevated sections of the road to establish the superelevations as staked by the Engineer or Designated Agent. This will be paid for as *Aggregate Base*.

Any concrete or HMA driveways will be saw cut and removed as marked by the Engineer. This will be paid for as *Pavt, Rem* or *HMA Surface, Rem* respectively.

All gravel driveways within the paving limits shall have an HMA tab placed for a distance of 2-feet back in the driveway during paving operations, paid for as *HMA, 4EL* and *HMA, 5EL*.

There are 2 monuments within the project limits. These will be preserved, paid for as *Monument Preservation* and *Monument Box*.

HMA will be paved in two lifts. The base course will be 2-inches of *HMA, 4EL* and the top course will be 1.5-inches of *HMA, 5EL*.

Prior to paving the top course, the base course shall be swept of dirt and debris and have a uniform layer of bond coat (tack) applied at a rate of 0.05 to 0.15 gallons per square yard. The bond coat must be given time to cure before the surface is paved.

HMA valley gutter shall be placed in locations where there is potential for water runoff to erode and wash away any proposed shoulder gravel. These locations will be marked out by the Engineer or Designated Agent. This work will be included in the item *HMA, 5EL*.

3-foot gravel shoulders shall be placed along the roadway within 7 calendar days of paving, weather permitting. 23A aggregate shall be used for the gravel shoulders, to be paid for as *Shld, Cl II*. All gravel shoulders shall be blended in with the existing back of shoulder or ditch for proper drainage. Shouldering must be completed on a road segment before payment will be issued for any work at that location.

Embankment will be placed as needed to create 1:3 side slopes. This will be paid for as *Embankment, CIP*.

All disturbed areas will be restored per the special provision “Slope Restoration, Non Freeway”. This work will be paid for as *Slope Restoration, Non-Freeway, Type A.*

CALHOUN COUNTY ROAD DEPARTMENT

SPECIAL PROVISION
FOR
HOT MIX ASPHALT (HMA) APPLICATION ESTIMATE

CCRD: SRC, BJK 1 of 1 01/10/2024

a. General. This work shall be done in accordance with the requirements of Section 501 of the Michigan Department of Transportation's 2020 Standard Specifications for Construction except as herein specified.

b. Construction Methods. HMA Mix shall be applied as shown in Section 501 of the Michigan Department of Transportation 2020 Standard Specifications.

- All HMA mixes shall have a shall have a yield of 110 pounds per square yard per inch of thickness.
- The Performance Grade asphalt binder range for HMA, 4EL and HMA, 5EL shall be 64-22.
- The uniform rate of application of Bond Coat material shall be 0.05 to 0.15 gal. per syd. Bond Coat shall not be a separate pay item.

c. Materials. The HMA, 4EL and HMA, 5EL shall meet the gradation as specified in Special Provision 20SP 501I-01, except the air void shall be 3%. Tier 2 HMA is allowable for the HMA, 4EL and HMA, 5EL, in accordance with 20SP-501F-01.

AWI > 260

The Bond Coat material shall be SS-1h, per Section 501.03 of the Michigan Department of Transportation 2020 Standard Specifications.

d. Measurement and Payment. The complete work of HMA, 4EL and HMA, 5EL shall be paid for at the contract unit price for the following

Pay Item	**Pay Unit**
HMA, 4EL	Ton
HMA, 5EL	Ton

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
RECYCLED HOT MIX ASPHALT MIXTURE ON LOCAL AGENCY PROJECTS

CFS:KPK 1 of 2 APPR:JWB:CJB:02-26-20
FHWA:APPR:03-02-20

Add the following subsection to subsection 501.02.A.2 of the Standard Specifications for Construction.

c. **Reclaimed Asphalt Pavement (RAP) and Binder Grade Selection**. The method for determining the binder grade in HMA mixtures incorporating RAP is divided into three categories designated Tier 1, Tier 2 and Tier 3. Each tier has a range of percentages that represent the contribution of the RAP binder toward the total binder, by weight. The tiers identified below apply to HMA mixtures with the following exception: Superpave mixture types EML, EML High Stress, EMH, EMH High Stress, and EH, EH High Stress used as leveling or top course must be limited to a maximum of 27 percent RAP binder by weight of the total binder in the mixture.

Recycled materials may be used as a substitute for a portion of the new materials required to produce HMA mixtures in accordance with contract.

- **Tier 1 (0% to 17% RAP binder by weight of the total binder in the mixture).** No binder grade adjustment is made to compensate for the stiffness of the asphalt binder in RAP.

- **Tier 2 (18% to 27% RAP binder by weight of the total binder in the mixture).** For all mixtures no binder grade change will occur in Tier 2 for all shoulder and temporary road mixtures.

  Ensure the required asphalt binder grade is at least one grade lower for the low temperature than the design binder grade required for the specified project mixture type. Lowering the high temperature of the binder one grade is optional. For example, if the design binder grade for the mixture type is PG 58-22, the required grade for the binder in the HMA mixture containing RAP would be a PG 52-28 or a PG 58-28.

  For Marshall Mixes, no binder grade change will be required when Average Daily Traffic (ADT) is above 7000 or Commercial Average Daily Traffic (CADT) is above 700. No binder grade change will occur for EL mixtures used as leveling or top course.

  The asphalt binder grade can also be selected using a blending chart for high and low temperatures. Supply the blending chart and the RAP test data used in determining the binder selection according to *AASHTO M323*.

- **Tier 3 (≥ 28% RAP binder by weight of the total binder in the mixture).** The binder grade for the asphalt binder is selected using a blending chart for high and low temperatures per *AASHTO M323*. Supply the blending chart and the RAP test data

used in determining the binder selection.

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
ACCEPTANCE OF HOT MIX ASPHALT MIXTURE ON LOCAL AGENCY PROJECTS

CFS:KPK 1 of 7 APPR:CJB:JWB:02-26-20
FHWA:APPR:03-13-20

a. Description. This special provision provides sampling and testing requirements for local agency projects using the roller method and the nuclear density gauge testing. Provide the hot mix asphalt (HMA) mixture in accordance with the requirements of the standard specifications, except where modified herein.

b. Materials. Provide aggregates, mineral filler (if required), and asphalt binder to produce a mixture proportioned within the master gradation limits shown in the contract, and meeting the uniformity tolerance limits in Table 1.

Table 1: Uniformity Tolerance Limits for HMA Mixtures

Parameter			Top and Leveling Course		Base Course	
Number	Description		Range 1 (a)	Range 2	Range 1 (a)	Range 2
1	% Binder Content		-0.30 to +0.40	±0.50	-0.30 to +0.40	±0.50
2	% Passing	# 8 and Larger Sieves	±5.0	±8.0	±7.0	±9.0
		# 30 Sieve	±4.0	±6.0	±6.0	±9.0
		# 200 Sieve	±1.0	±2.0	±2.0	±3.0
3	Crushed Particle Content (b)		Below 10%	Below 15%	Below 10%	Below 15%

a. This range allows for normal mixture and testing variations. The mixture must be proportioned to test as closely as possible to the Job-Mix-Formula (JMF).
b. Deviation from JMF.

Parameter number 2 as shown in Table 1 is aggregate gradation. Each sieve will be evaluated on one of the three gradation tolerance categories. If more than one sieve is exceeding Range 1 or Range 2 tolerances, only the one with the largest exceedance will be counted as the gradation parameter.

The master gradation should be maintained throughout production; however, price adjustments will be based on Table 1. Aggregates which are to be used in plant-mixed HMA mixtures must not contain topsoil, clay, or loam.

c. Construction. Submit a Mix Design and a JMF to the Engineer. Do not begin production and placement of the HMA until receipt of the Engineer's approval of the JMF. Maintain the binder content, aggregate gradation, and the crushed particle content of the HMA mixture within the Range 1 uniformity tolerance limits in Table 1. For mixtures meeting the definition of top or leveling course, field regress air void content to 3.5 percent with liquid asphalt cement unless specified otherwise on HMA application estimate. For mixtures meeting the definition of base course, field regress air void content to 3.0 percent with liquid asphalt cement unless specified

otherwise on HMA application estimate.

Ensure all persons performing Quality Control (QC) and Quality Assurance (QA) HMA field sampling are "Local Agency HMA Sampling Qualified" samplers. At the pre-production or preconstruction meeting, the Engineer will determine the method of sampling to be used. Ensure all sampling is done in accordance with *MTM 313 (Sampling HMA Paving Mixtures)* or *MTM 324 (Sampling HMA Paving Mixtures Behind the Paver)*. Samples are to be taken from separate hauling loads.

For production/mainline type paving, obtain a minimum of two samples, each being 20,000 grams, each day of production, for each mix type. The Engineer will sample and maintain possession of the sample. Sampling from the paver hopper is prohibited. Each sample will be divided into two 10,000 gram parts with one part being for initial testing and the other part being held for possible dispute resolution testing. Obtain a minimum of three samples for each mix type regardless of the number of days of production.

Obtain samples that are representative of the day's paving. Sample collection is to be spaced throughout the planned tonnage. One sample will be obtained in the first half of the tonnage and the second sample will be obtained in the second half of the tonnage. If planned paving is reduced or suspended, when paving resumes, the remaining sampling must be representative of the original intended sampling timing.

Ensure all persons performing testing are Bit Level One certified or Bit QA/QC Technician certified.

Ensure daily test samples are obtained, except, if the first test results show that the HMA mixture is in specification, the Engineer has the option of not testing additional samples from that day.

At the pre-production or preconstruction meeting, the Engineer and Contractor will collectively determine the test method for measuring asphalt content (AC) using *MTM 319 (Determination of Asphalt Content from Asphalt Paving Mixtures by the Ignition Method)* or *MTM 325 (Quantitative Extraction of Bitumen from HMA Paving Mixtures)*. Back calculation will not be allowed for determining asphalt content.

Ensure all labs performing local agency acceptance testing are qualified labs per the *HMA Production Manual and the Michigan Quality Assurance Procedures Manual,* and participate in the MDOT round robin process, or they must be *AASHTO Materials Reference Laboratory* (AMRL) accredited for *AASHTO T30* or *T27*, and *AASHTO T164* or *T308*. Ensure on non-National Highway System (NHS) routes, Contractor labs are made available, and may be used, but they must be qualified labs as previously stated. Contractor labs may not be used on NHS routes. Material acceptance testing will be completed by the Engineer within 14 calendar days, except holidays and Sundays, for projects with less than 5,000 tons (plan quantity) of HMA and within 7 calendars days, except holidays and Sundays, for projects with 5,000 tons (plan quantity) or more of HMA, after the Engineer has obtained the samples. QA test results will be provided to the Contractor after the Engineer receives the QC test results. Failure on the part of the Engineer or the laboratory to provide QA test results within the specified time frame does not relieve the Contractor of their responsibility to provide an asphalt mix within specifications.

The correlation procedure for ignition oven will be established as follows. Asphalt binder content based on ignition method from MTM 319. Gradation (*ASTM D5444*) and Crushed particle content *(MTM 117)* based on aggregate from *MTM 319*. The incineration temperature will be established

at the pre-production meeting. The Contractor will provide a laboratory mixture sample to the acceptance laboratory to establish the correction factor for each mix. Ensure this sample is provided to the Engineer a minimum of 14 calendar days prior to production.

For production/mainline type paving, the mixture may be accepted by visual inspection up to a quantity of 500 tons per mixture type, per project (not per day). For non-production type paving defined as driveways, approaches, and patching, visual inspection may be allowed regardless of the tonnage.

The mixture will be considered out-of-specification, as determined by the acceptance tests, if for any one mixture, two consecutive tests per parameter, (for Parameter 2, two consecutive aggregate gradations on one sieve) are outside Range 1 or Range 2 tolerance limits. If a parameter is outside of Range 1 tolerance limits and the second consecutive test shows that the parameter is outside of Range 2, then it will be considered to be a Range 1 out-of-specification. Consecutive refers to the production order and not necessarily the testing order. Out-of-specification mixtures are subject to a price adjustment per the Measurement and Payment section of this special provision.

Contractor operations will be suspended when the mixture is determined to be out-of-specification, but contract time will continue to run. The Engineer may issue a Notice of Non-Compliance with Contract Requirements (Form 1165), if the Contractor has not suspended operations and taken corrective action. Submit a revised JMF or proposed alterations to the plant and/or materials to achieve the JMF to the Engineer. Effects on the Aggregate Wear Index (AWI) and mix design properties will be taken into consideration. Production and placement cannot resume until receipt of the Engineer's approval to proceed.

Pavement in-place density will be measured using one of two approved methods. The method used for measuring in-place density will be agreed upon at a pre-production or preconstruction meeting.

Pavement in-place density tests will be completed by the Engineer during paving operations and prior to traffic staging changes. Pavement in-place density acceptance testing will be completed by the Engineer prior to paving of subsequent lifts and being open to traffic.

Option 1 - Direct Density Method

Use of a nuclear density gauge requires measuring the pavement density using the Gmm from the JMF for the density control target. The required in-place density of the HMA mixture must be 92.0 to 98.0 percent of the density control target. Nuclear density testing and frequency will be in accordance with the *MDOT Density Testing and Inspection Manual*.

Option 2 - Roller Method

The Engineer may use the Roller Method with a nuclear or non-nuclear density gauge to document achieving optimal density as discussed below.

Use of the density gauge requires establishing a rolling pattern that will achieve the required in-place density. The Engineer will measure pavement density with a density gauge using the Gmm from the JMF for the density control target.

Use of the Roller Method requires developing and establishing density frequency curves, and

meeting the requirements of Table 2. A density frequency curve is defined as the measurement and documentation of each pass of the finished roller until the in-place density results indicate a decrease in value. The previous recording will be deemed the optimal density. The Contractor is responsible for establishing and documenting an initial or QC rolling pattern that achieves the optimal in-place density. When the density frequency curve is used, the Engineer will run and document the density frequency curve for each half day of production to determine the number of passes to achieve the maximum density. Table 5, located at the end of this special provision, can be used as an aid in developing the density frequency curve. The Engineer will perform density tests using an approved nuclear or non-nuclear gauge per the manufacturer's recommended procedures.

Table 2: Minimum Number of Rollers Recommended Based on Placement Rate

Average Laydown Rate, Square Yards per Hour	Number of Rollers Required (a)	
	Compaction	Finish
Less than 600	1	1 (b)
601 - 1200	1	1
1201 - 2400	2	1
2401 - 3600	3	1
3601 and More	4	1

a. Number of rollers may increase based on density frequency curve.
b. The compaction roller may be used as the finish roller also.

After placement, roll the HMA mixture as soon after placement as the roller is able to bear without undue displacement or cracking. Start rolling longitudinally at the sides of the lanes and proceed toward the center of the pavement, overlapping on successive trips by at least half the width of the drum. Ensure each required roller is 8 tons minimum in weight unless otherwise approved by the Engineer.

Ensure the initial breakdown roller is capable of vibratory compaction and is a maximum of 500 feet behind the paving operations. The maximum allowable speed of each roller is 3 miles per hour (mph) or 4.5 feet per second. Ensure all compaction rollers complete a minimum of two complete rolling cycles prior to the mat temperature cooling to 180 degrees Fahrenheit (F). Continue finish rolling until all roller marks are eliminated and no further compaction is possible. The Engineer will verify and document that the roller pattern has been adhered to. The Engineer can stop production when the roller pattern is not adhered to.

d. Measurement and Payment. The completed work, as described, will be measured and paid for using applicable pay items as described in subsection 501.04 of the Standard Specifications for Construction, or the contract, except as modified below.

Base Price. Price established by the Department to be used in calculating incentives and adjustments to pay items and shown in the contract.

If acceptance tests, as described in section c. of this special provision, show that a Table 1 mixture parameter exceeds the Range 1, but not the Range 2, tolerance limits, that mixture parameter will be subject to a 10 percent penalty. The 10 percent penalty will be assessed based on the acceptance tests only unless the Contractor requests that the 10,000 gram sample part retained for possible dispute resolution testing be tested. The Contractor has 4 calendar days from receipt

of the acceptance test results to notify the Engineer, in writing, that dispute resolution testing is requested. The Contractors QC test results for the corresponding QA test results must result in an overall payment greater than QA test results otherwise the QA tests will not be allowed to be disputed. The Engineer has 4 calendar days to send the dispute resolution sample to the lab once dispute resolution testing is requested. The dispute resolution sample will be sent to an independent lab selected by the Local Agency, and the resultant dispute test results will be used to determine the penalty per parameter, if any. Ensure the independent lab is a MDOT QA/QC qualified lab or an AMRL HMA qualified lab. The independent lab must not have conflicts of interest with the Contractor or Local Agency. If the dispute testing results show that the mixture parameter is out-of-specification, the Contractor will pay for the cost of the dispute resolution testing and the contract base price for the material will be adjusted, based on all test result parameters from the dispute tests, as shown in Table 3 and Table 4. If the dispute test results do not confirm the mixture parameter is out-of-specification, then the Local Agency will pay for the cost of the dispute resolution testing and no price adjustment is required.

If acceptance tests, as described in section c. of this special provision, show that a Table 1 mixture parameter exceeds the Range 2 tolerance limits, the 10,000 gram sample part retained for possible dispute resolution testing will be sent, within 4 calendar days, to the MDOT Central Laboratory for further testing. The MDOT Central Laboratory's test results will be used to determine the penalty per mixture parameter, if any. If the MDOT Central Laboratory's results do not confirm the mixture parameter is out-of-specification, then no price adjustment is required. If the MDOT Central Laboratory's results show that the mixture is out-of-specification and the Engineer approves leaving the out-of-specification mixture in place, the contract base price for the material will be adjusted, based on all parameters, as shown in Table 3 and Table 4.

In the case that the Contractor disputes the results of the test of the second sample obtained for a particular day of production, the test turn-around time frames given would apply to the second test and there would be no time frame on the first test.

The laboratory (MDOT Central Laboratory or independent lab) will complete all Dispute Resolution testing and return test results to the Engineer, who will provide them to the Contractor, within 13 calendar days upon receiving the Dispute Resolution samples.

In all cases, when penalties are assessed, the penalty applies to each parameter, up to two parameters, that is out of specification.

Table 3: Penalty Per Parameter

Mixture Parameter out-of-Specification per Acceptance Tests	Mixture Parameter out-of-Specification per Dispute Resolution Test Lab	Price Adjustment per Parameter
No	N/A	None
Yes	No	None
	Yes	Outside Range 1 but not Range 2: decrease by 10%
		Outside Range 2: decrease by 25%

The quantity of material receiving a price adjustment is defined as the material produced from the time the first out-of-specification sample was taken until the time the sample leading to the first in-specification test was taken.

Each parameter of Table 1 is evaluated with the total price adjustment applied to the contract base price based on a sum of the two parameter penalties resulting in the highest total price adjustment as per Table 4. For example, if three parameters are out-of-specification, with two parameters outside Range 1 of Table 1 tolerance limits, but within Range 2 of Table 1 limits and one parameter outside of Range 2 of Table 1 tolerance limits and the Engineer approves leaving the mixture in place, the total price adjustment for that quantity of material is 35 percent.

Table 4: Calculating Total Price Adjustment

Cost Adjustment as a Sum of the Two Highest Parameter Penalties		
Number of Parameters Out-of-Specification	Range(s) Outside of Tolerance Limits of Table 1 per Parameter	Total Price Adjustment
One	Range 1	10%
	Range 2	25%
Two	Range 1 and Range 1	20%
	Range 1 and Range 2	35%
	Range 2 and Range 2	50%
Three	Range 1, Range 1 and Range 1	20%
	Range 1, Range 1 and Range 2	35%
	Range 1, Range 2 and Range 2	50%
	Range 2, Range 2 and Range 2	50%

Table 5: Density Frequency Curve Development

Tested by: _____ Date/Time: _____

Route/Location:		Air Temp:
Control Section/Job Number:		Weather:
Mix Type:	Tonnage:	Gauge:
Producer:	Depth:	Gmm:

Roller #1 Type:

Pass No.	Density	Temperature	Comments
1			
2			
3			
4			
5			
6			
7			
8			
Optimum			

Roller #2 Type:

Pass No.	Density	Temperature	Comments
1			
2			
3			
4			
5			
6			
7			
8			
Optimum			

Roller #3 Type:

Pass No.	Density	Temperature	Comments
1			
2			
3			
4			
5			
6			
7			
8			
Optimum			

Summary: _____

_____

_____

_____

_____

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
SLOPE RESTORATION, NON-FREEWAY

RSD:JLB 1 of 4 APPR:DMG:NJM:08-25-21

a. Description. This work consists of preparing all lawns and slopes on non-freeway projects designated for slope restoration on the plans or as directed by the Engineer and applying topsoil, fertilizer, seed, mulch with mulch anchor, mulch blanket, high velocity mulch blanket, permanent turf reinforcement mat (TRM), bonded fiber matrix (BFM), or modified mulch blanket to those areas. Ensure turf establishment is in accordance with section 816 and 917 of the Standard Specifications for Construction and Standard Plan R-100 Series, except as modified herein or otherwise directed by the Engineer.

b. Materials. The materials and application rates specified in sections 816 and 917 of the Standard Specifications for Construction apply unless modified by this special provision or otherwise directed by the Engineer. Furnish the following materials on this project:

1. Seeding mixture as called for on the plans.

2. Chemical fertilizer nutrient, Class A.

3. Topsoil either furnished or salvaged. Remove any stones greater than 1/2 inch in diameter or other debris from all topsoil.

4. Mulching material.

5. Permanent Turf Reinforcement Mat (TRM) must be 100 percent synthetic and consist of 100 percent UV stabilized polyolefin fibers sewn between two layers of black UV stabilized polypropylene netting with polyolefin thread. The TRM must meet the following “minimum average roll value” requirements:

Property	Test Method	Requirement
Mass/Unit Area	*ASTM D6566*	10 oz/syd
Ultraviolet Stability @ 1000 hrs	*ASTM D4355/D4355M*	80 percent
Tensile Strength (MD)	*ASTM D6818*	165 lbs/ft

Acceptance. Supply a General Certification for the permanent TRM from one of the following manufacturers or approved equal:

Recyclex TRM	American Excelsior Co., Arlington, TX	(800) 777-7645
P300 TRM	North American Green, Poseyville, IN	(800) 772-2040
Landlok 450 TRM	Propex, Inc., Chattanooga, TN	(800) 621-1273
Excel PP5-10 TRM	Western Excelsior, Evansville, IN	(866) 540-9810
Vmax P550 TRM	North American Green, Poseyville, IN	(800) 772-2040

6. Bonded Fiber Matrix (BFM). Furnish a product from the list below or an approved

equal.

Soil Guard	Mat Inc., Floodwood, MN	(888) 477-3028
HydroStraw BFM	HydroStraw, LLC, Rockford, WA	(800) 545-1755
HydraMax	North American Green, Poseyville, IN	(800) 772-2040
Bindex BFM	American Excelsior Co., Arlington, TX	(800) 777-7645
ProMatrix EFM	Profile Products LLC, Buffalo Grove, IN	(800) 508-8681

If multiple grades of the selected product are available, use the grade appropriate for the application as approved by the Engineer.

Approved equal BFM must consist of long strand, virgin wood fibers (90 percent by weight) bound together by a pre-blended, high-strength polymer adhesive (10 percent by weight). The virgin wood fibers will be thermally refined from clean whole wood chips. Ensure the organic binders are a high-viscosity colloidal polysaccharide tackifier with activating agents to render the resulting matrix insoluble upon drying.

7. Modified Mulch Blanket. Where modified mulch blanket is required, provide an excelsior mulch blanket free of chemical additives. Ensure the netting thread is 100 percent biodegradable and manufactured with non-plastic materials such as jute, sisal, or coir fiber. Degradable, photodegradable, UV-degradable, oxo-degradable, or oxo-biodegradable plastic netting including polypropylene, nylon, polyethylene, and polyester is not an acceptable alternative. All netting materials must have a loose weave design with movable junctions between the machine and cross-machine direction twines that move independently and reduce the potential for wildlife entanglement.

c. Construction. Ensure construction methods are in accordance with subsection 816.03 of the Standard Specifications for Construction. Begin this work as soon as possible after final grading of the areas designated for slope restoration but no later than the maximum time frames specified in subsection 208.03 of the Standard Specifications for Construction. It may be necessary, as directed by the Engineer, to place materials by hand.

Shape, compact, and ensure all areas to be seeded are weed-free prior to placing topsoil. Place topsoil to the minimum depth indicated above to meet proposed finished grade. If the area being restored requires more than the minimum depth of topsoil to meet finished grade, fill this additional depth using topsoil or, at the Contractor's option, embankment. Furnishing and placing this additional material is included in this item of work.

Ensure topsoil is weed and weed seed free and friable prior to placing seed. Remove any stones greater than 1/2-inch in diameter or other debris. Apply seed mixture and fertilizer to prepared soil surface. Incorporate seed into top 1/2-inch of topsoil.

Apply mulch at a rate of two tons per acre. Place mulch anchoring over the mulch at a rate specified in subsection 816.03.F of the Standard Specifications for Construction. Place mulch blanket and high velocity mulch blanket in accordance with subsection 816.03.G of the Standard Specifications for Construction and Standard Plan R-100 Series.

Install areas constructed with the TRM on prepared (seeded) grades as shown on the plans in accordance with the manufacturer's published installation guidelines. Anchor the top edge of the TRM in a minimum six-inch deep trench. Operation of equipment on the slope is prohibited after placement of the TRM. No credit for splices, overlaps, tucks, or wasted material will be made.

Mix the BFM and organic binders thoroughly at a rate of 40 pounds for each 100 gallons of water or as otherwise recommended by the manufacturer. Hydraulically apply the BFM slurry in successive layers, from two or more directions, to fully cover 100 percent of the soil surface. Ensure the minimum application rate is at least 3000 pounds of BFM for each acre or otherwise apply in accordance with the manufacturer's recommendations as appropriate depending on site conditions.

Do not apply BFM on saturated soils or immediately before, during, or after rainfall.

Install modified mulch blanket in accordance with the manufacturer's published guidelines and as directed by the Engineer.

If an area washes out after this work has been properly completed and approved by the Engineer, make the required corrections to prevent future washouts and replace the topsoil, fertilizer, seed, and mulch treatment. This replacement will be paid for as additional work using the applicable contract pay items.

If an area washes out for reasons attributable to the Contractor's activity or failure to take proper precautions, replacement will be at no cost to the contract.

The Engineer will inspect the seeded turf to ensure it is well-established, in a vigorous growing condition, and contains the species called for in the seeding mixture.

If the seeded turf is not well-established at the end of the first growing season, the Contractor is responsible to re-seed until the turf is well established and approved by the Engineer.

Provide weed control, if weeds are determined by the Engineer to cover more than 10 percent of the total area of slope restoration, in accordance with subsection 816.03.I of the Standard Specifications for Construction. Weed control will be at no additional cost to the contract.

d. Measurement and Payment. The completed work, as described, will be measured and paid for at the contract unit price using the following pay items:

Pay Item	**Pay Unit**
Slope Restoration, Non-Freeway, Type __	Square Yard

1. Place **Slope Restoration, Non-Freeway, Type A** in all areas not described in the other types of slope restoration and will be measured by area in square yards in place. **Slope Restoration, Non-Freeway, Type A** includes installing Topsoil Surface, Furn, LM or Topsoil Surface, Salv, 4 inch; Fertilizer, Chemical Nutrient, Class A; seeding mixture; Mulch; and Mulch Anchoring.

2. Place **Slope Restoration, Non-Freeway, Type B** parallel (8 feet minimum) to the edge of the roadway, in areas that have a 1 on 3 slope and in any ditch with a grade less than 1.5 percent, as shown on the plans, or as directed by the Engineer. **Slope Restoration, Non-Freeway, Type B** will be measured by area in square yards in place. **Slope Restoration, Non-Freeway, Type B** includes installing Topsoil Surface, Furn, LM or Topsoil Surface, Salv, 4 inch; Fertilizer, Chemical Nutrient, Class A; seeding mixture; and Mulch Blanket.

3. Place **Slope Restoration, Non-Freeway, Type C** in areas that have a 1 on 2 slope, any ditch with a grade of 1.5 percent to 3 percent as shown on the plans, or as directed by the Engineer. **Slope Restoration, Non-Freeway, Type C** will be measured by area in square yards in place. **Slope Restoration, Non-Freeway, Type C** includes installing Topsoil Surface, Furn, LM or Topsoil Surface, Salv, 4 inch; Fertilizer, Chemical Nutrient, Class A; seeding mixture; and Mulch Blanket, High Velocity.

4. Place **Slope Restoration, Non-Freeway, Type D** in areas that have a slope steeper than 1 on 2, any ditch with a grade steeper than 3 percent as shown on the plans, or as directed by the Engineer. **Slope Restoration, Non-Freeway, Type D** will be measured by area in square yards in place. **Slope Restoration, Non-Freeway, Type D** includes installing Topsoil Surface, Furn, LM or Topsoil Surface, Salv, 4 inch; Fertilizer, Chemical Nutrient, Class A; seeding mixture; and Turf Reinforcement Mat.

5. Place **Slope Restoration, Non-Freeway, Type E** as shown on the plans, or as directed by the Engineer and measured by area in square yards in place. **Slope Restoration, Non-Freeway, Type E** includes installing Topsoil Surface, Furn, LM or Topsoil Surface, Salv, 4 inch; Fertilizer, Chemical Nutrient, Class A; seeding mixture; and Bonded Fiber Matrix.

6. Place **Slope Restoration, Non-Freeway, Type F** as shown on the plans, or as directed by the Engineer and measured by area in square yards in place. **Slope Restoration, Non-Freeway, Type F** includes installing Topsoil Surface, Furn, LM or Topsoil Surface, Salv, 4 inch; Fertilizer, Chemical Nutrient, Class A; seeding mixture; and modified Mulch Blanket.