

# Admin Minnesota **Office of State Procurement**

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## CONTRACT RELEASE: B-357(5)

**DATE:** MAY 1, 2025

**PRODUCT/SERVICE:** BITUMINOUS MATERIAL & CRACK AND JOINT SEALERS

**CONTRACT PERIOD:** MAY 1, 2022, THROUGH APRIL 30, 2026

**EXTENSION OPTIONS:** UP TO 12 MONTHS

**ACQUISITION MANAGEMENT SPECIALIST/BUYER (AMS):** STACI STOERZINGER

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CONTRACT VENDOR	CONTRACT NO.	TERMS	DELIVERY
BITUMINOUS MATERIAL - VARIOUS	VARIOUS	NET 30	FOR PICK UP ONLY
CRACK AND JOINT SEALERS - VARIOUS	VARIOUS	NET 30	FOR PICK UP OR DELIVERY

**CONTRACT USERS.** This Contract is available to the following entities as indicated by the checked boxes below

- State agencies
- Cooperative Purchasing Venture (CPV) members

**STATE AGENCY CONTRACT USE.** State agencies should make every effort to use the Contract Vendor(s) listed. However, this Contract does not prohibit State agencies from using their delegated local purchasing authority to procure similar products and services from other vendors.

**STATE AGENCY ORDERING INSTRUCTIONS.** Orders are to be placed directly with the Contract Vendor. State agencies should use a Contract release order (CRO) or a blanket purchase order (BPC). The person ordering should include his or her name and phone number. A copy of all orders must be submitted to the Contract Vendor via fax, email, or US mail.

**COOPERATIVE PURCHASING VENTURE (CPV) MEMBER ORDERING INSTRUCTIONS.** This Contract is available to all CPV members per Minn. Stat. § 16C.03, subd. 10 and Minn. Stat. § 471.59, subd. 1. For more information on the Cooperative Purchasing Venture Program, see State web site: <https://mn.gov/admin/osp/other-purchasers/cpv/>. CPV member must inform the Contract Vendor they are utilizing the State Contract to ensure correct pricing. Orders are to be placed directly with the Contract Vendor and must identify this Contract Release, A-234(5), and the Contract Vendor's specific contract number.

**CONTRACT FEEDBACK.** If these commodities or service can be better structured to help you with your business needs, let us know. We solicit your comments and suggestions to improve all of our contracts so that they may better serve your business needs. If you have a need for which no contract currently exists, or you would like to be able to use an existing state contract that is not available to your entity, whether a state agency or CPV, please contact us. If you have specific comments or suggestions about an individual contract you can submit those via the [Contract Feedback Form](#).

## **SPECIAL TERMS AND CONDITIONS**

**SCOPE.** The purpose of these Contracts is for furnishing bituminous materials to be picked up and crack and joint sealer materials to be picked up or delivered to all requesting State of Minnesota Agencies and Cooperative Purchasing Venture (CPV) members, on an as needed basis.

**PURCHASES.** State agencies and CPV Members may purchase bituminous material and or crack and joint sealer for projects based on availability, cost, and location of material. Ordering entities should call ahead prior to issuing a purchase order to ensure that Contract Vendors have adequate material inventory available for pick up. The Contract Vendor may not be able to furnish all requested material if specified materials are unavailable due to current inventory, plant schedule, or plant closure.

State agencies or CPV Member trucks or contract for truck hauling services may to pick up crack filler and joint sealer or may have the material delivered per the Contract Vendor(s) price list.

State agencies or CPV Member trucks are required to pick up the bituminous materials. State agencies and CPV Members without trucks will be required to use their delegated local purchasing authority to

**PICKUP.** Daytime pickup will be 6:30 AM through 4:30 PM Monday through Friday.

**NIGHTTIME PICKUP (IF APPLICABLE).** Contact Vendors have indicated which product, if any, will be available for nighttime pickup. Please verify with each applicable Contract Vendor instructions for nighttime pick up.

**BUYING "OFF CONTRACT".** This Contract does not prohibit the State agencies and CPV Members from using their delegated local purchasing authority to procure similar goods and services from other Vendors. The State reserves the right to solicit pricing for individual projects.

**PRICES.** Prices are firm through the entire contract period. At no time should the ordering entity pay more than the Contract price. Agencies and CPV Members must contact the AMS immediately and fill out a Vendor Performance Report if there is a discrepancy between the price on the invoice and the Contract price.

**PRICE DECREASES.** During the life of the Contract, any or all temporary price reductions, promotional price offers, introductory pricing, or any other offers or promotions that provide prices lower than or discounts higher than those stated in the Contract, must be given immediately to the entities eligible to purchase from the Contract. Invoices for goods ordered or shipped or services performed during the decrease, or promotion, must immediately reflect such pricing.

**VERIFYING THE CONTRACT PRICES.** The Contract(s) was executed with FIXED PRICING. The pricing offered must match or be lower than that detailed herein.

Only accept contract vendor quotes that provide itemized contract pricing (lump sum price quotes must be rejected and reworked by the Contract Vendor to show itemized State contract pricing).

Prior to accepting an order and/or issuing payment on an invoice, inspect the goods and/or deliverables to ensure they match both the terms and pricing of the contract.

Contact the AMS/Buyer detailed herein to report any pricing discrepancies or for assistance in confirming/calculating contract pricing.

## SPECIFICATION REQUIREMENTS FOR BITUMINOUS MATERIAL

All bituminous material items shall comply with the latest specifications per the Minnesota Department of Transportation (MnDOT) Standard Specifications for Construction - 2020 Edition, available online at <http://www.dot.state.mn.us/pre-letting/spec/index.html> and the Wisconsin Department of Transportation Standard Specifications available online at <https://wisconsin.dot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/rdwystnds-spec.aspx>. Specification sections for each material type on the Price Schedules are included below for convenience

### 2231 - BITUMINOUS SURFACE RECONDITIONING

#### 2231.1 DESCRIPTION

This work consists of reconditioning the existing pavement surface before constructing a bituminous overlay or surfacing courses.

#### 2231.2 MATERIALS

##### A Bituminous Patching Mixture

Provide bituminous patching material matching the type of material used in the first layer of bituminous surfacing placed on the reconditioned surface.

##### B Mixture for Joints and Cracks

Provide a mixture for joints and cracks consisting of a prepared mix of fine aggregate and bituminous material in accordance with the following requirements:

Material	Requirement
½ inch Sieve	100*
No. 8 Sieve	45 – 80*
No. 200 Sieve	2.0 – 7.0*
Aggregate Spall	< 5 percent
Bituminous Material	6.5 – 7.0 <sup>†</sup>

\* Percent passing requirement.  
 | Match PG grade to grade used on first Lift of plant mixed asphalt.  
<sup>†</sup> Percent by weight

##### C Joint and Crack Filler

Provide joint and crack filler in accordance with the special provisions.

### 2357 - BITUMINOUS TACK COAT

#### 2357.1 DESCRIPTION

This work consists of applying bituminous material (emulsion or cutback asphalt) on a bituminous or concrete pavement prior to paving a new lift of Plant Mixed Asphalt.

#### 2357.2 MATERIALS

##### A Bituminous Material 3151

The bituminous material for tack coat will be limited to one of the following kinds of emulsified asphalt. Use of medium cure cutback asphalt (MC-250) is allowed during the early and late construction season when it is anticipated the air temperature may drop below 32 degrees Fahrenheit.

Allowable grades are as follows:

**Emulsified Asphalt**

AASHTO M 208, "Standard Specification for Cationic Emulsified Asphalt," dilution of the emulsion to 7 parts emulsion to 3 parts water is only allowed by the supplier. No field dilution is allowed. The storage tank for diluted emulsion must have a recirculation system or agitator that will prevent settlement or separation of the Material.

<b>Table 2357-1 Residual Asphalt Content</b>		
	<b>Minimum Residual Asphalt Content</b>	
<b>Emulsion</b>	<b>Undiluted</b>	<b>Diluted (7:3)</b>
CSS-1 or CSS-1h	57%	40%

**Cutback Asphalt**

Medium Cure Liquid Asphalt MC-250

Use only sources listed on the Approved/Qualified Products List for "Asphalt Products."

**2357.3 CONSTRUCTION REQUIREMENTS**

**A Restrictions**

Conduct tack coat operations in a manner that offers the least inconvenience to traffic. Maintain movement in at least one direction at all times without pickup or tracking of the bituminous material.

Do not apply the tack coat when the road surface or weather conditions are unsuitable as determined by the Engineer. Limit the daily application of tack coat to approximately the area on which construction of the subsequent bituminous course can reasonably be expected to be completed that day.

**B Equipment**

Apply the bituminous material with a distributor meeting the requirements of 2360.3.B.2.d.

**C Road Surface Preparations**

Remove all foreign matter on the road surface before applying tack coat and dispose of as approved by the Engineer.

Apply the bituminous tack coat material to a dry and clean roadway surface. All necessary repairs or reconditioning must have been completed as provided for in the Contract and approved by the Engineer.

**D Application of Bituminous Tack Coat Material**

Unless otherwise indicated in the Plans or provisions, apply the bituminous tack coat material within the application rates shown below in Table 2357.3-1, as based on pavement type or condition and type of bituminous material. **Dilution of asphalt emulsion in the field is not allowed.**

Before placing an abutting bituminous course, provide a uniform coating of liquid asphalt or emulsified asphalt to the contact surfaces of all fixed structures and at the edge of the in-place mixture in all courses at transverse joints and in the final wearing course at longitudinal joints.

All tack coat must break and turn from brown to black, before paving the subsequent lift or course. Do not allow vehicles to drive on tack that has not broken.

Apply a uniform tack coat to the existing asphalt or concrete surface and to the surface of each course or lift constructed, except for the final course or lift. Tack each lift when placing multiple lifts in the same day. Uniform application will not have streaks (corn rows), bare spots, puddles, or other irregular patterns. The Engineer will compare the freshly sprayed emulsion to a brown sheet of construction paper or a black sheet of construction paper for broken tack coat to determine conformance with tack coat application uniformity.

Using a distance of 1,000 feet perform a yield check at the beginning of each project to verify the application rate is correct. The Engineer may require additional yield checks be performed if the application rate is questioned.

The Engineer may also require the Contractor to verify application is within 10% of the intended application rate by ASTM D2995, Standard Practice for Estimating Application Rate and Residual Application Rate of Bituminous Distributors, test method A.

<b>Table 2357.3-1 Tack Coat Application Rates</b>			
	<b>Application Rates - gallon/square yard</b>		
<b>Surface Type</b>	<b>Undiluted Emulsion</b>	<b>Diluted Emulsion (7:3)*</b>	<b>MC Cutback   </b>
New Asphalt	0.04 to 0.06	0.06 to 0.09	0.05 to 0.07
Old Asphalt <sup>†</sup> and PCC	0.05 to 0.09	0.075 to 0.135	0.09 to 0.11
Milled Asphalt and Milled PCC	0.06 to 0.09	0.09 to 0.135	0.09 to 0.11
<b>Notes:</b>			
*As provided by the asphalt emulsion supplier (see 2357.2A, "Bituminous Material")			
Use when approved by the Engineer			
<sup>†</sup> Older than 1 year			

**E Bituminous Temperature**

The application temperature of the bituminous material will be:

CSS-1, CSS-1H 70 to 160° F  
 MC-250 165 to 220° F

**F Bituminous Sampling**

Sample asphalt emulsion from either the spigot or a nozzle on the distributor according to the schedule of materials control.

**G Pedestrian Crossings**

Spread sand on newly tacked surfaces at regularly utilized and open for public use pedestrian crossings.

**H Acceptance of Tack Material**

The Engineer will address failures related to 3151, "Bituminous Material," in accordance with 2357.5A, "Monetary Adjustments." Deficiencies related to workmanship or application will be addressed in accordance with 1512, "Unacceptable and Unauthorized Work."

**2357.4 METHOD OF MEASUREMENT**

Bituminous material used for tack coat will be measured by volume at 60° F...

**2357.5 BASIS OF PAYMENT**

Payment for the accepted quantity of asphalt emulsion and cutback shall be at the Contract price per unit of measure. The cost of providing and applying sand at pedestrian crossings will be incidental.

Payment for the tack coat will be made based on the following schedule:

<b>Item No:</b>	<b>Item:</b>	<b>Unit:</b>
2357.506	Bituminous Material for Tack Coat	Gallon

If the contract does not contain a pay item for Bituminous Material for Tack Coat, the cost will be incidental to the project work with no direct compensation made.

**2360 PLANT MIXED ASPHALT PAVEMENT**

**2360.1 DESCRIPTION**

This work consists of constructing plant mixed asphalt pavement on a prepared surface. Plant mixed asphalt pavement designed according to a gyratory mix design method for use as a pavement surface.

**A Mixture Designations**

The Department will designate the mixture for asphalt mixtures in accordance with the following:

- (1) The first two letters indicate the mixture design type:
  - (1.1) SP = Gyratory Mixture Design.
- (2) The third and fourth letters indicate the course:
  - (2.1) WE = Wearing and shoulder wearing course, and
  - (2.2) NW = Non-wearing Course.
- (3) The fifth letter indicates the maximum aggregate size:
  - (3.1) A = 1/2 in [12.5mm], SP 9.5,
  - (3.2) B = 3/4 in [19.0mm], SP 12.5,
  - (3.3) C = 1 in [25.0mm], SP 19.0, and
  - (3.4) D = 3/8 in [9.5mm], SP 4.75.
- (4) The sixth digit indicates the Traffic Level (ESAL's × 10<sup>6</sup>) in accordance with Table 2360-1, "Traffic Levels".

<b>Table 2360-1 Traffic Levels</b>	
<b>Traffic Level</b>	<b>20 Year Design ESALs</b>
2 *	< 1
3	1 – < 3
4	3– < 10
5	10 – ≤ 30
6	>30 (See SMA Provision)
NOTE: The requirements for gyratory mixtures in this specification are based on the 20-year design traffic level of the project, expressed in Equivalent Single Axle Loads (ESAL's) 1 × 10 <sup>6</sup> ESALs	
* AADT < 2,300	
AADT > 2,300 to < 6,000	

- (5) The last two digits indicate the air void requirement:
  - (5.1) 40 = 4.0 percent for wear mixtures, and
  - (5.2) 30 = 3.0 percent for non-wear and shoulder.
- (6) The letter at the end of the mixture designation identifies the asphalt binder grade in accordance with Table 2360.1-2, "Asphalt Grades".

<b>Table 2360.1-2 Asphalt Grades</b>	
<b>Letter</b>	<b>Grade</b>
A	PG 52S – 34
B	PG 58S – 28
C	PG 58H – 34
E	PG 58H – 28
F	PG 58V – 34
H	PG 58V – 28
I	PG 58E – 34
L	PG 64S – 22
M	PG 49S – 34

Ex: Gyrotory Mixture Designation -- SPWEB540E (Mix Design Type, Course, Aggregate Size, Traffic Level, Voids, Binder)

**2360.2 MATERIALS**

**A Aggregate**

Use aggregate materials in accordance with 3139

**B Asphalt Binder Material -----3151**

**C Additives**

The Department defines additives as material added to an asphalt mixture or material that does not have a specific pay item.

Do not incorporate additives into the mixture unless approved by the Engineer. Add anti-foaming agents to asphalt cement at the dosage rate recommended by the manufacturer. The Contractor may add mineral filler in quantities no greater than 5 percent of the total aggregate weight. The Contractor may add hydrated lime in quantities no greater than 2 percent of the total aggregate weight. Do not add a combination of mineral filler and hydrated lime that exceeds 5 percent of the total aggregate weight. Use methods for adding additives as approved by the Engineer.

**C.1 Mineral Filler -----AASHTO M 17**

**C.1.a Mineral Filler – Hydrated Lime**

Provide hydrated lime for asphalt mixtures with no greater than 8 percent unhydrated oxides (as received basis) and meeting the requirements of AASHTO M 216. Use a method to introduce and mix hydrated lime and aggregate as approved by the Engineer before beginning mixture production.

**C.2 Liquid Anti-Stripping Additive (Contractor Added)**

If adding a liquid anti-strip additive to the asphalt binder, complete blending before mixing the asphalt binder with the aggregate. Only use liquid anti-strip additives that ensure the asphalt binder meets the Performance Grade (PG) requirements in 3151. The Contractor may use asphalt binder with liquid anti-strip added at the refinery or the Contractor may add liquid anti-strip at the plant site. If using asphalt binder with liquid anti-strip added at the refinery, ensure the supplier tests the binder and additive blend to confirm compliance with the AASHTO M 320. If an anti-strip agent is added at the plant, the plant mixed asphalt producer is considered a supplier, and the binder must conform to the requirements of 3151. Do not pave until the asphalt binder and additive blend testing results meet the criteria in 2360.2B, "Asphalt Binder Material".

**C.2.a Mixture Requirements at Design**

Design the mixture with the same asphalt binder supplied to the plant site using mixture option 1, "Laboratory Mixture Design" or mixture option 2, "Modified Mixture Design".

Provide documentation with either design option and include the amount of anti-strip needed to meet the minimum tensile strength requirements. Verify that the binder with the anti-strip meets the PG binder requirements for the mixture.

**C.2.b Contractor Production Testing Requirements**

Sample and test the asphalt binder and anti-strip blend daily. The Contractor may test the blend by viscosity, penetration, or dynamic sheer rheometer (DSR) of the blend. If the contract requires the use of a polymer modified asphalt binder in the mixture, use the DSR as the daily QC test.

Send the Engineer and MnDOT Chemical Laboratory Director a weekly QC report summarizing the results of the daily testing.

Perform at least one test bi-weekly per project to ensure the binder and anti-strip blend meets the requirements of AASHTO M 320. Send the test results to the Engineer and MnDOT Chemical Laboratory Director.

Provide asphalt binder and anti-strip blend field verification samples in accordance with 2360.2G.7, "Production Test".

**C.2.c Liquid Anti-Strip Additive Metering System**

Include a liquid anti-strip flow meter and an anti-strip pump with the metering system. Connect the flow meter to the liquid anti-strip supply to measure and display only the anti-strip being fed to the asphalt binder.

Position the meter readout so that the inspector can easily read it.

Provide means to compare the flow meter readout with the calculated output of the anti-strip pump.

Provide a system that displays the accumulated anti-strip quantity being delivered to the mixer unit in gallons [liters] to the nearest gallon [liter] or in units of tons [metric tons] to the nearest 0.001 ton [0.001 tonnes].

Calibrate and adjust the system to maintain an accuracy of ± 1 percent.

Calibrate each plant set-up before producing the mixture.

"Stick" the anti-strip tank at the end of the day's production to verify anti-strip usage quantities. The Engineer may require "sticking" on a daily basis.

Ensure the system has a spigot for sampling the binder and anti-strip after blending.

Use alternative blending and metering systems only when pre-approved by the Engineer.

**C.3 Coating and Anti Stripping Additive .....3161**

**C.4 Warm Mix Asphalt (WMA)**

WMA is allowed on all projects. Any mix that is produced at temperatures 30°F or lower than typical HMA mixing temperature of the asphalt binder, as defined by the asphalt supplier, is considered as WMA. The WMA can be manufactured through use of foamed asphalt and/or chemical additive processes. Notify the Engineer in advance of using any WMA additive or process. When chemical additives are used, provide the plant mixing and the laboratory mixing, and compaction temperatures as recommended by the manufacturer of the additive.

**D Bituminous Tack Coat .....2357**

**E Mixture Design**

**E.1 Submittal Location**

Submit documentation and sample aggregate materials for review to the District Materials Laboratory.

**E.2 Aggregate Quality**

Provide aggregate in accordance with 3139.2.

**E.3 Restrictions**

Do not add aggregates and materials not included in the original mixture submission unless otherwise approved by the Engineer.

**E.4 Responsibility**

Design a gyratory mixture that meets the requirements of this specification in accordance with the following:

- (1) MnDOT Laboratory Manual Method 1820,
- (2) The Asphalt Institute's Superpave Mix Design Manual SP-2 (Use a 2 h short term aging period for volumetric),  
and
- (3) The Laboratory Manual.

**E.5 Type of Mixture Design Submittal**

**E.5.a Option 1 — Laboratory Mixture Design**

**E.5.a (1) Aggregate**

Submit the aggregate samples for option 1, at least 15 working days before beginning production samples for quality testing. At least 30 calendar days before beginning asphalt production, submit samples of aggregates that require the magnesium sulfate soundness test to the District Materials Laboratory. Test the samples for quality of each source, class, type, and size of virgin and non-asphaltic salvage aggregate source used in the mix design. Retain a companion sample of equal size until the Department issues a Mixture Design Report. Provide 24 h notice of intent to sample aggregates to the Engineer. Provide samples in accordance with the following:

<b>Table 2360.2-1 Aggregate Sample Size</b>		
<b>Classification</b>	<b>Sieve</b>	<b>Weight</b>
Virgin	Retained on No. 4	80 lb.
Virgin	Passing No. 4	35 lb.
Recycled asphalt pavement (RAP)	—	80 lb.
Recycled asphalt shingles (RAS)	—	10 lb. sample of representative RAS material

**E.5.a (2) Mixture Sample**

At least 7 working days before the start of asphalt production, submit the proposed Job Mix Formula (JMF) in writing and signed by a Level II Quality Management mix designer for each combination of aggregates to be used in the mixture. Include test data to demonstrate conformance to mixture properties as specified in Table 2360.2-4, “Mixture Requirements”, and 3139.2, “Bituminous Aggregates”. Use forms approved by the Department for the submission.

Submit an uncompacted mixture sample plus briquettes, in conformance with the JMF, compacted at the optimum asphalt content and required compactive effort for laboratory examination and evaluation. Provide a mixture sample size and the number of compacted briquettes and in accordance with the following:

<b>Table 2360.2-2 Mixture Sample Requirements</b>	
<b>Item</b>	<b>Gyratory Design</b>
Uncompacted mixture sample size	75 lb.
Number of compacted briquettes	2

**E.5.a (3) Tensile Strength Ratio Sample**

At least 7 days before actual production, submit sample to the District Materials Laboratory for verification of moisture sensitivity retained tensile strength ratio (TSR). The Engineer may test material submitted for TSR verification for maximum specific gravity  $G_{mm}$  compliance in addition to TSR results. The Engineer will reject the submitted mix design if the tested material fails to meet the  $G_{mm}$  tolerance. If the Engineer rejects a mix design, submit a new mix design in accordance with 2360.2E, “Mixture Design”. The Contractor may use one of the following options to verify that the TSR meets the requirements in Table 2360.2-4, “Mixture Requirements”.

**E.5.a (4) Option A**

Batch material at the design proportions including optimum asphalt. Split the sample before curing and allow samples to cool to room temperature, approximately 77 °F. Submit 80 lb. of mixture to the District Materials Laboratory for curing and test verification. Use a cure time of 2 h ±15 minutes at 290 °F cure time for both groups and follow procedures Laboratory Manual Method 1813.

**E.5.a (5) Option B**

Batch and cure in accordance with Option A. Compact and submit briquettes and uncompacted mixture in accordance with Table 2360.2-3, “Option B Mixture Requirements”.

<b>Table 2360.2-3 Option B Mixture Requirements</b>	
<b>Item</b>	<b>Gyratory Design</b>
Un-compacted mixture sample size	8,200 g
Number of compacted briquettes*	6
Compacted briquette air void content	6.5 % – 7.5 %
* 6 in [150 mm] specimens.	

For both options, cure for 2 h ±15 min at 290° F meeting the requirements in the MnDOT Laboratory Manual Method 1813.

**E.5.a (6) Aggregate Specific Gravity**

Determine the specific gravity of aggregate in accordance with Laboratory Manual Methods 1204 and 1205.

**E.5.b Option 2 — Modified Mixture Design**

The Contractor may use the modified mixture design if testing shows that the aggregates meet the requirements of 3139.2 in the current construction season and if the Level II mix designer submitting the mixture design has at least 2 years’ experience in mixture design. The Department will not require mixture submittal.

**E.5.b(1) Mixture Aggregate Requirements**

Size, grade, and combine the aggregate fractions in proportions that are in accordance with 3139.2A.

**E.5.b(2) JMF Submittal**

At least 2 working days before beginning asphalt production, submit a proposed JMF in writing to the District Materials Laboratory signed by a Level II Quality Management mix designer for each combination of aggregates. For each JMF submitted, include documentation in accordance with 2360.2E.5.a, “Option1 – Laboratory Mixture Design”, to demonstrate conformance to mixture properties as specified in Table 2360.2-4, -- Mixture Requirements, II and Table 3139.2-3, “Mixture Aggregate Requirements”. Submit the JMF on forms approved by the Department.

**E.5.b(3) Initial Production Test Verification**

The Department will take a mix verification sample within the first four samples at the start of production of each mix type. The Engineer will notify the Contractor electronically when a sample is to be taken and tested for tensile strength ratio (TSR). Initial production testing will be done within the first 5,000 tons [4500 tonnes] of the start of production.

**E.6 Mixture Requirements**

The Department will base mixture evaluation on the trial mix tests and in accordance with Table 2360.2-4, “Mixture Requirements”.

<b>Table 2360.2-4 Mixture Requirements</b>				
<b>Traffic Level</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
20-year design ESALs	< 1 million	1 – 3 million	3 – 10 million	10 – 30 million
<b>Gyratory mixture requirements:</b>				
Gyrations for N <sub>design</sub>	40	60	90	100
% Air voids at N <sub>design</sub> , wear	4.0	4.0	4.0	4.0
% Air voids at N <sub>design</sub> , Non-wear and all shoulder	3.0	3.0	3.0	3.0
Adjusted Asphalt Film Thickness, minimum micrometer	8.5	8.5	8.5	8.5
TSR*, minimum %	75	75	80†	80†
Fines/effective asphalt	0.6 – 1.2	0.6 – 1.2	0.6 – 1.2	0.6 – 1.2
* Use 6 in [150 mm] specimens in accordance with 2360.2G.7.I, “Field Tensile Strength Ratio (TSR)”.				
MnDOT minimum = 65				
† MnDOT minimum = 70				

**E.7 Minimum Ratio of Added Asphalt Binder to Total Asphalt Binder**

Control recycled materials used in mixture by evaluating the ratio of new added asphalt binder to total asphalt binder as show in Table 2360.2-5.

<b>Table 2360.2-5</b>			
<b>Requirements for Ratio of Added New Asphalt Binder to Total Asphalt Binder* min%:</b>			
Specified Asphalt Grade 2	Recycled Material		
	RAS Only	RAS + RAP	RAP Only
PG 58X <sup>3</sup> -28, PG 52S-34, PG 49-34, PG 64S-22			
Wear	70	70	70
Non-Wear	70	70	65
PG 58X <sup>3</sup> -34			
Wear & Non-Wear	80	80	80

1 The ratio of added new asphalt binder to total asphalt binder is calculated as (added binder/total binder) x 100  
 2 The Contractor can elect to use a blending chart to verify compliance with the specified binder grade. The Department may take production samples to ensure the asphalt binder material meets the requirements. The blending chart is on the Bituminous Office Website.  
<sup>3</sup>X=S,H,V,E

**E.8 Adjusted Asphalt Film Thickness (Adj. AFT) MnDOT Laboratory Manual Method 1854**

Ensure the adjusted asphalt film thickness (Adj. AFT) of the mixture at design and during production meets the requirements of Table 2360.2-4, "Mixture Requirements". Base the Adj. AFT on the calculated aggregate surface area (SA) and the effective asphalt binder content.

**E.9 Documentation**

Include the following documentation and test results with each JMF submitted for review:

- (1) Names of the individuals responsible for the QC of the mixture during production,
- (2) Low project number of the contract on which the mixture will be used,
- (3) Traffic level and number of gyrations,
- (4) The following temperature ranges as supplied by the asphalt binder supplier:
  - (4.1) Laboratory mixing and compaction,
  - (4.2) Plant discharge, and
  - (4.3) Field compaction.
- (5) The percentage in units of 1 percent (except the No. 200 sieve [0.075 mm] in units of 0.1 percent) of aggregate passing each of the specified sieves (including the No. 16, No. 30, No. 50, and No. 100) for each aggregate to be incorporated into the mixture. Derive the gradation of the aggregate from the RAP after extracting the residual asphalt.
- (6) Source descriptions of the following:
  - (6.1) Location of material,
  - (6.2) Description of materials,
  - (6.3) Aggregate pit or quarry number, and
  - (6.4) Proportion amount of each material in the mixture in percent of total aggregate.
- (7) Composite gradation based on (5) and (6) above. Include virgin composite gradation based on (6) and (7) above for mixtures containing RAP/RAS.
- (8) Bulk and apparent specific gravities and water absorption (by % weight of dry aggregate). Both coarse and fine aggregate, for each product used in the mixture (including RAP/RAS). Use MnDOT Laboratory Manual Method 1204 and 1205. The tolerance allowed between the Contractor's and the Department's specific gravities are Gsb (individual) = 0.040 [+4 and -4] and Gsb (combined) = 0.020.
- (9) FHWA 0.45 power chart represented by the composite gradation plotted on Federal Form PR-1115
- (10) Test results from the composite aggregate blend at the proposed JMF proportions showing compliance with Table 3139.2-3:
  - (10.1) Coarse Aggregate Angularity,
  - (10.2) Fine Aggregate Angularity, and
  - (10.3) Flat and Elongated

- (11) Extracted asphalt binder content for mixtures containing RAP/RAS with no retention factor included.
- (12) Asphalt binder percentage in units of 0.1 percent based on the total mass of the mixture and the PG grade.
- (13) Each trial mixture design includes the following:
  - (13.1) At least 3 different asphalt binder contents (with at least 0.4 percent between each point), with at least one point at, one point above and one point below the optimum asphalt binder percentage.
  - (13.2) Maximum specific gravity for each asphalt binder content calculated based on the average of the effective specific gravities measured by using at least two maximum specific gravity tests at the asphalt contents above and below the expected optimum asphalt binder content.
  - (13.3) Test results on at least two specimens at each asphalt binder content for the individual and average bulk specific gravities, density, and heights.
  - (13.4) Percent air voids of the mixture at each asphalt binder content.
  - (13.5) Adj. AFT for each asphalt binder content.
  - (13.6) Fines to Effective Asphalt (F/A) ratio calculated to the nearest 0.1 percent.
  - (13.7) TSR at the optimum asphalt binder content.
  - (13.8) Graphs showing air voids, adjusted AFT, Gmb, Gmm and unit weight vs. percent asphalt binder content for each of the three asphalt binder contents submitted with trial mix.
  - (13.9) Evidence that the completed mixture will conform to design air voids (Va), Adj. AFT, TSR, F/Ae (Fines to effective asphalt ratio).
  - (13.10) Gyratory densification tables and curves generated from the gyratory compactor for all points used in the mixture submittal.
  - (13.11) % new asphalt binder to total asphalt binder.
- (14) The Contractor has the option of augmenting the submitted JMF with additional sand or rock. When using this option, provide samples of the aggregate for quality analysis in accordance with 2360.2E.5, "Type of Mixture Design Submittal". Also provide mix design data for two additional design points per add-material. Provide one point to show a proportional adjustment to the submitted JMF that includes 5 percent, by weight, add-material at the JMF optimum asphalt percent. Provide a second point to show a proportional adjustment to the submitted JMF that includes 10 percent, by weight, add material at the JMF optimum asphalt percent. Report the following information for each of these two points:
  - (14.1) The maximum specific gravity determined by averaging two tests,
  - (14.2) Test results showing the individual and average bulk specific gravity, density, and height of at least two specimens at the optimum asphalt binder content,
  - (14.3) Percent air voids for the mixture for each point,
  - (14.4) Fines to Effective Asphalt ratio calculated to the nearest 0.1 of a percent,
  - (14.5) Crushing of the coarse and fine aggregate,
  - (14.6) Adj. AFT, and,
  - (14.7) Up to two add materials will be allowed.

#### **F Mixture Design Report**

The Department will provide a Mixture Design Report consisting of the JMF. Include the following in the JMF:

- (1) Composite gradation,
- (2) Aggregate component proportions,
- (3) Asphalt binder content of the mixture,
- (4) Design air voids,
- (5) Adj. asphalt film thickness, and
- (6) Aggregate bulk specific gravity values.

Show the JMF limits for gradation control sieves in accordance with aggregate gradation broadbands shown in Table 3139.2-2, percent asphalt binder content, air voids, and Adj. AFT. If the Department issues a Mixture Design Report, this report only confirms that the Department reviewed the mixture and that it meets volumetric properties shown in Table 2360.2-4 and Table 2360.2-5. The Department

makes no guaranty or warranty, either express or implied, that compliance with volumetric properties ensures specification compliance regarding placement and compaction of the mixture.

Provide materials meeting the requirements of the aggregate and mixture design before issuing a Mixture Design Report. The Department will review two trial mix designs per mix type designated in the plan per contract at no cost to the Contractor. The Department will verify additional mix designs at a cost of \$2,000 per design.

Provide a Department - reviewed Mixture Design Report for all paving except for small quantities of material as described in 2360.3G, "Small Quantity Paving".

For city, county, and other agency projects, provide the District Materials Laboratory a complete project proposal, including addenda, supplemental agreements, change orders, and plans sheets, including typical sections, affecting the mix design before the Department begins the verification process.

## **G Mixture Quality Management**

### **G.1 Quality Control (QC)**

The Contractor will perform Quality Control (QC) as part of the production process. QC is the process control of the operations related to mixture production and determining the quality of the mixture being produced. The QC sample is the Contractor's sample taken and tested during production and used to control the production process. Provide and maintain a QC program for plant mix asphalt production, including mix design, process control inspection, sampling and testing, and adjustments in the process related to the production of an asphalt pavement.

#### **G.1.a Plant Certification**

Provide the following to obtain certification:

- (1) Completed and submitted request form application for plant inspection.
- (2) Site map showing stockpile locations.
- (3) Signed asphalt plant inspection report showing the plant and testing facility passed as documented by Asphalt Plant Inspection Report (TP 02142-02, TP 02143-02). The inspection report must also include documentation showing plant and laboratory equipment has been calibrated and is being maintained to the tolerance shown in the Bituminous Manual and sections 1200, 1800, and 2000 of the Mn/DOT Laboratory Manual.
- (4) A Department-signed Mixture Design Report (MDR) before mixture production.

#### **G.1.b Maintaining Certification**

Maintain plant certification by documenting the production and testing of the certified plant asphalt mixtures. Sample and test asphalt mixtures in accordance with this section and meeting the requirements of the Schedule of Materials Control.

##### **G.1.b(1) Annual Certification**

Perform annual certification after winter suspension.

##### **G.1.b(2) Sampling Rate**

Sample at the rate in accordance with 2360.2G.6 and the requirements of the Schedule of Materials Control.

##### **G.1.b(3) Plant Moved**

Recertify the plant if the plant moves to a new or previously occupied location.

#### **G.1.c. Plant Certification Revocation**

The Engineer may revoke certification for any of the following reasons:

- (1) If the mix does not meet the requirements of 2360.2E.6, 2360.2E.7, and 3139.2A.
- (2) If there is a failure to meet the testing rates, or
- (3) If it is determined records were falsified.

If the Engineer revokes plant certification, the Department may revoke the Technical Certification of the individual or individuals involved. The Department will maintain a list of companies with revoked certifications.

**G.2 Quality Assurance (QA)**

The Engineer will perform Quality Assurance (QA) as part of the acceptance process. QA is the process of monitoring and evaluating various aspects of the Contractor 's testing as described below. The QA sample is the Department 's companion sample to the Contractor 's QC sample. QA testing is performed to accept the work. The Engineer will perform the following:

- (1) Conduct QA and verification sampling and testing,
- (2) Observe the QC sampling and tests,
- (3) Monitor the required QC summary sheets and control charts,
- (4) Verify calibration of QC laboratory testing equipment,
- (5) Communicate Department test results to the Contractor 's personnel on a daily basis, and
- (6) Ensure Independent Assurance (IA) sampling and testing requirements are met.

If the Engineer observes that the Contractor is not performing sampling and quality control tests in accordance with the applicable test procedures, the Engineer may stop production until the Contractor takes corrective action. The Engineer will notify the Contractor of observed deficiencies promptly, both verbally and in writing.

The Engineer may obtain additional samples, at any time and location during production, to determine quality levels in accordance with 2360.2G.3, "Verification Sample".

The Department will post a chart with the names and telephone numbers for the personnel responsible for QA.

The Engineer will calibrate and correlate laboratory testing equipment in accordance with the Bituminous Manual and Laboratory Manual.

<b>Table 2360.2-6</b>	
<b>Allowable Differences between Contractor and Department Test Results*</b>	
<b>Item</b>	<b>Allowable Difference</b>
Mixture bulk specific gravity ( $G_{mb}$ )	0.030
Mixture maximum specific gravity ( $G_{mm}$ )	0.019
Adjusted AFT (calculated)	1.2
Fine Aggregate Angularity, uncompacted voids (U) %	1
Coarse Aggregate Angularity, % fractured faces (%P)	15
Aggregate Individual Bulk Specific Gravity (+ No. 4 [+4.75 mm])	0.040
Aggregate Individual Bulk Specific Gravity (- No. 4 [-4.75mm])	0.040
Aggregate combined blend Specific Gravity ( $G_{sb}$ )	0.020
Tensile strength ratio (TSR), %	Table 2360.2-4
<b>Asphalt binder content:</b>	
Meter method, %	0.2
Spot check method, %	0.2
Chemical extraction methods, %	0.4
Incinerator oven, %	0.3
Chemical vs. meter, spot check, or incinerator methods	0.4
Incinerator oven vs. spot check	0.4
<b>Gradation sieve, % passing:</b>	
1 in , ¾ in , ½ in , ⅜ in	6
No. 4 [4.75 mm]	5
No. 8, No. 16, No. 30	4
No. 50	3
No. 100	2
No. 200	1.2
* Test tolerances listed are for single test comparisons.	

### **G.3 Verification Sample**

The Department will take at least one randomly determined sample daily per mix type from behind the paver or from the truck box and will consider this a verification sample. The split of this sample, given to the Contractor, must be tested by the Contractor and will replace the next scheduled QC sample. Sample enough Material to accommodate retesting in case the samples fail.

The Department will perform verification testing on production tests and will include the test results on the test summary sheet and compare test results to Specification requirements. Additionally, the Department's verification test will be compared to the Contractor's verification companion to validate compliance with Table 2360.2-6.

The Contractor may access the Department's verification test results for Gmm (mixture maximum gravity), Gmb (mixture bulk gravity), air voids (calculated), asphalt binder content, within 2 Working Days from the time the sample is delivered to the District Laboratory. The Department will provide the gradation, crushing, and Adj. AFT (calculated) results to the Contractor within 3 Working Days.

If the tolerances between the Contractor's verification companion and the Department's verification sample do not meet the requirements of Table 2360.2-6, the Department will retest the Material.

If the verification sample retests do not meet tolerances:

- 1) The Department will immediately investigate the cause of the difference. This will include a review of testing Equipment, procedures, worksheets, and personnel to determine the source of the problem. The Engineer may require both the Department and Contractor to perform at least one hot-cold comparison of mixture properties as discussed below.

- 2) The Department will test all QA samples for that day and base acceptance on QC data with substitution of Department test results for those parameters out of tolerance. Volumetric properties will be recalculated if necessary. If the Adj. AFT calculation does not meet the tolerance, equalize the Department Adj. AFT result by increasing the original Department value by 0.5 microns. Use the increased Department Adj. AFT for the individual Adj. AFT result and to calculate the moving average Adj. AFT results. The increased Department Adj. AFT will form the basis for acceptance.

Cease mixture production and placement if reestablished test results do not meet tolerances within 48 hours. Resume production and placement only after meeting the tolerances. The process for dispute resolution is available on the Bituminous Office website.

If the Engineer analyzes the data using statistical methods for determination of bias and finds a bias in the test results, the Engineer will specify which results to use. If through analysis of data, it is determined that there is a bias in the test results, the Engineer will determine which results are appropriate and will govern.

#### **G.3.a Hot-Cold Comparison**

To perform a hot-cold comparison, split the sample into three representative portions. The Engineer will observe the Contractor testing. The Contractor will compact and determine mix properties from one portion while still hot. Apply additional heating to raise the temperature of the sample to compaction temperature if necessary. Allow the second and third portions to cool to air temperature. One portion will be reheated and tested by the Department and the other portion will be reheated and tested by the Contractor. On the same day and at the same time as the District Materials Laboratory, reheat mix samples to 160°F to allow splitting of the sample into representative fractions for the various tests. Do not overheat the mixture portions used for testing maximum specific gravity. Heat samples to compaction temperature and compact.

Develop a calibration factor to compare the specific gravity of the hot compacted samples to reheated compacted samples. Use at least two gyratory specimens for each test. The Engineer or the Contractor may request that this test be repeated.

#### **G.4 Contractor Quality Control**

##### **G.4.a Personnel**

Submit an organizational chart listing the names and phone numbers of individuals and alternates responsible for the following:

- (1) Mix design,
- (2) Process control administration, and
- (3) Inspection.

Provide QC technicians certified as a Level I Bituminous Quality Management (QM) Tester meeting the requirements of the MnDOT Technical Certification Program for QC testing and Level II Bituminous QM Mix Designer to make process adjustments. Provide at least one person per paving operation certified as a Bituminous Street Inspector.

Provide a laboratory with equipment and supplies for Contractor quality control testing and maintain with the following:

- (1) Up-to-date equipment calibrations and a copy of the calibration records with each piece of equipment,
- (2) Telephone,
- (3) Fax and copy machine; however, the Engineer may waive the requirement to have a fax machine if internet and email are available,
- (4) Internet and Email,
- (5) Computer,
- (6) Printer, and
- (7) Microsoft Excel, version 2013 or newer

Laboratory equipment need to meet the requirements listed in Section 400 of the Bituminous Manual, Laboratory Manual, and these specifications, including having extraction capabilities. Before beginning production, the laboratory equipment needs to be calibrated and operational.

Calibrate and correlate all testing equipment in accordance with the Bituminous Manual and Laboratory Manual. Keep records of calibration for each piece of testing equipment in the same facility as the equipment.

##### **G.4.b Sampling and Testing**

Take QC samples at random tonnage or locations, quartered from a larger sample of mixture. Sample randomly and in accordance with the Schedule of Materials Control. Determine random numbers and tonnage or locations using the Bituminous Manual, Section 720.4, or ASTM D3665, Standard Practice for Random Sampling of Construction Materials, Section 5, or an Engineer approved alternate method of random number generation. Sample either behind the paver or from the truck box at the plant site. Other sampling locations can be approved by the Engineer. The Contractor must decide and notify the Engineer where samples will be taken before production begins. The Contractor and Engineer must both agree to a change of sampling location once production has begun. The procedure for truck box sampling is on the Bituminous Office website. The Contractor will obtain at least a 130-pound sample. Split the sample in the presence of the Inspector. When truck box sampling and testing is performed at the plant site, in order to account for asphalt absorption, the sample needs to be kept heated at the compaction temperature for 30 minutes before splitting and batching into test portions. The Inspector will retain possession of the portion of each split sample that is taken. Store compacted mixture specimens and loose mixture companion samples for 10 Calendar Days. Label these split companion samples with companion numbers.

If coarse and fine aggregate angularity are not evaluated for every QC sample retain the extracted gradation samples for the respective QC samples for additional testing. Keep the aggregate samples in containers with field identification labels for a period of 10 calendar days. The Engineer will identify which extracted gradation sample is the Verification Companion and whether it is to be tested for coarse and fine aggregate angularity.

**G.5 Production Test Requirements**

Determine the planned tonnage [metric tons] for each mixture planned for production during the production day. Divide the planned production by 1,000 and round to the next highest whole number. The result is the number of production tests required for the mixture. Table 2360.2-8, "Production Testing Rates" shows the required production tests.

Split the planned production into even increments and select sample locations as described above. If actual tonnage is greater than the planned tonnage, repeat the calculation above and provide additional tests if the calculation results in a higher number of production tests. During production, the Department will not require mixture volumetric property tests if mix production is no greater than 300 ton [270 tonne]. Provide production tests if the accumulative weight on successive days is greater than 300 ton [270 tonne].

If there is a choice of more than one MnDOT approved test procedure, select one method at the beginning of the project with the approval of the Engineer and use that method for the entire project. The Contractor and Engineer may agree to change test procedures during the construction of the project.

**G.5a Establishing an Ignition Oven Correction Factor MnDOT Lab. Manual 1853 Appendix**

On the first day of production, for each mixture type, both the Contractor and the Agency will establish an ignition oven correction factor from the produced mixture. Re-establish correction factors when:

There is aggregate or RAP substitutions

There are 3 or more tolerance failures on the extracted asphalt content between the Agency and the Contractor as defined by Table 2360.2-6, "Allowable Differences between Contractor and Department Test Results".

**G.6 Production Testing Rates**

**G.6.a Start –Up**

At the start of production, for the first 2,000 ton [1,800 tonne] of each mix type, perform testing at the following frequencies:

<b>Table 2360.2-7 Production Start-Up Testing Rates</b>		
<b>Production Test</b>	<b>Laboratory Manual Method</b>	<b>Section</b>
Bulk Specific Gravity	1806	2360.2G.7.b, "Gyratory Bulk Specific Gravity, Gmb"
Maximum Specific Gravity	1807	2360.2G.7.c, "Maximum Specific Gravity, Gmm"
Air Voids (calculated)	1808	2360.2G.7.d, "Air Voids – Individual and Isolated, (Calculation)"
Asphalt Content	1853	2360.2G.7.a, "Asphalt Binder Content"
Add AC/Total AC Ratio (calculated)	1853	2360.2G.7.a, "Asphalt Binder Content"
Adj. AFT {Calculated}	1854	2360.2G.7.b, "Gyratory Bulk Specific Gravity, Gmb"
Gradation	1203	2360.2G.7.f, "Gradation – Blended Aggregate"
Coarse Aggregate Angularity	1214	2360.2G.7.g, "Coarse Aggregate Angularity"
Fine Aggregate Angularity (FAA)	1206	2360.2G.7.h, "Fine Aggregate Angularity"
Fines to Effective Asphalt Ratio (calculated)	1203 & 1853	2360.2G.7.f, "Gradation - Blended. Aggregate" & 2360.2G.7.a, "Asphalt Binder Content"

**G.6.b Production**

After producing the first 2,000 ton of each mix type test at the following frequencies:

**Table 2360.2-8 Production Testing Rates**

<b>Production Test</b>	<b>Test Reference</b>	<b>Section</b>
Bulk Specific Gravity	<i>Laboratory Manual Method 1806</i>	2360.2G.7.b, "Gyratory Bulk Specific Gravity, Gmb"
Maximum Specific Gravity	<i>Laboratory Manual Method 1807</i>	2360.2G.7.c, "Maximum Specific Gravity, Gmm"
Air Voids {calculated}	<i>Laboratory Manual Method 1808</i>	2360.2G.7.d, "Air Voids- Individual and Isolated (calculation)"
Asphalt Content	<i>Laboratory Manual Method 18S3</i>	2360.2G.7.a, "Asphalt Binder Content"
Add AC/Total AC Ratio (calculated)	<i>Laboratory Manual Method 1853</i>	2360.2G.7.a, "Asphalt Binder Content"
Adj. AFT(Calculated)	<i>Laboratory Manual Method 18S4</i>	2360.2G.7.e, "Adjusted Asphalt Film Thickness (AFT)(Calculation)"
Gradation	<i>Laboratory Manual Method 1203</i>	2360.2G.7.f, "Gradation- Blended Aggregate"
Coarse Aggregate Angularity	<i>Laboratory Manual Method 1214</i>	2360.2G.7.g, "Coarse Aggregate Angularity"
Fine Aggregate Angularity (FAA)	<i>Laboratory Manual Method 1206</i>	2360.2G.7.h, "Fine Aggregate Angularity"
Fines to Effective Asphalt Ratio (calculated)	<i>Laboratory Manual Methods 1203 &amp; 1853</i>	2360.2G.7.f, "Gradation- Blended Aggregate" & 2360.2G.7.a, "Asphalt Binder Content"
TSR	<i>Laboratory Manual Method 1813</i>	2360.2G.7.i, "Field Tensile Strength Ratio (TSR)"
Aggregate Specific Gravity	<i>Laboratory Manual Methods 1204, 1205, and 181S</i>	2360.2G.7.j, "Aggregate Specific Gravity {Gsb}"
Mixture Moisture Content	<i>Laboratory Manual Method 1855</i>	2360.2G.7.k, "Moisture Content"
Asphalt Binder	<i>Bituminous Manual 720.2</i>	2360.2G.7.l, "Asphalt Binder Samples"

**G.7 Production Tests**

**G.7.a Asphalt Binder Content**

Spot checks are required only when the Engineer has waived the requirements of 2360.2G.8 relating to furnishing a computerized printout of the plant blending control system. A minimum of 1 spot check per day per mixture blend is required to determine the new added asphalt binder.

Use an incinerator oven meeting the requirements of the Laboratory Manual Method 1853. Do not use the incinerator oven if the percentage of Class B material is greater than 50 percent within the composite blend, unless the Contractor determines a correction factor approved by the Engineer.

Perform chemical extraction meeting the requirements of Laboratory Manual Method 1851 or 1852.

**G.7.b Gyrotory Bulk Specific Gravity, Gmb**

Use two specimens to determine gyrotory bulk specific gravity meeting the requirements of Laboratory Manual Method 1806. Set Gyrotory to an internal angle of  $1.16^\circ \pm 0.02^\circ$  according to AASHTO TP 71.

**G.7.c Maximum Specific Gravity, Gmm**

Determine maximum specific gravity meeting the requirements of Laboratory Manual Method 1807.

**G.7.d Air Voids – Individual and Isolated (Calculation)**

Calculate the individual and isolated air voids meeting the requirements of Laboratory Manual Method 1808. Use the maximum mixture specific gravity and corresponding bulk specific gravity from a single test to calculate the isolated air voids. Use the maximum specific gravity moving average and the bulk specific gravity from a single test to calculate the individual air voids.

Compact gyrotory design to  $N_{design}$  in accordance with Table 2360.2-4, "Mixture Requirementsll for the specified traffic level".

**G.7.e Adjusted Asphalt Film Thickness (AFT) (Calculation)**

Calculate the Adj. AFT meeting the requirements of the Laboratory Manual Method 1854.

**G.7.f Gradation – Blended Aggregate**

Determine the gradation of blended aggregate sample, from an extracted bituminous mixture, meeting the requirements of Laboratory Manual Method 1203.

**G.7.g Coarse Aggregate Angularity**

Test the Coarse Aggregate Angularity (CAA) meeting the requirements of Laboratory Manual Method 1214 to determine the CAA on composite blend from aggregates used in production of hot mix asphalt. Ensure CAA test results meet the requirements in accordance with Table 3139.2-3.

The Contractor may test mixtures containing virgin aggregates from composite belt samples. Test mixtures containing RAP from extracted aggregates taken from standard production samples. Test the percentage of fractured faces of the composite aggregate blend less than 100 percent twice a day for each mixture blend for at least two days, then one test per day if the test samples meet the CAA requirements. If the CAA crushing test results are greater than 8 percent of the requirements, take one sample per day and perform one test per week.

**G.7.h Fine Aggregate Angularity**

Use Laboratory Manual Method 1206 to test the composite blend from aggregates used in production of asphalt mixtures for Fine Aggregate Angularity (FAA) meeting the requirements of Table 3139.2-3. The Contractor may test mixtures that contain virgin aggregates from composite belt samples. Test mixtures that contain RAP from extracted aggregates taken from standard production samples. Perform two tests per day for each mixture blend for at least two days to test the percentage of uncompacted voids from the composite aggregate blend, then one test per day if the samples meet FAA requirements. If FAA test results are greater than 5 percent of the requirement, take one sample per day and one test per week.

**G.7.i Field Tensile Strength Ratio (TSR) Laboratory Manual Method 1813**

If the Engineer requires sampling and testing of the mixture to verify tensile strength ratio (TSR), both the Contractor and the Department will be required to test these samples within 72 hours after sampling. The Contractor shall obtain a sample weighing at least 110 lb. [50 kg] and split the sample in half to provide a sample for the Department and the Contractor. Label the Department companion of this split with the following information:

- (1) Date,
- (2) Time,
- (3) Project number, and
- (4) Cumulative tonnage to date.

After the sample is split and labeled, give the Department 's companion sample to the Department Street Inspector or Plant Monitor or to the Materials Engineer within 24 hours of sampling as directed by the Engineer. When using Option 2, obtain the sample within the first 5,000 ton of plant mixed asphalt produced or by the second day of production, whichever comes first, to verify tensile strength ratio (TSR). Take mixture samples from the windrow or truck box. Provide a 6 in [150 mm] specimen for gyratory design. The Contractor may test the sample at a permanent lab site or a field lab site. Refer to Table 2360.2-9, "Mixture Type, Minimum TSR", for the minimum acceptable TSR values for production. Stop production immediately if the material does not meet minimum TSR requirements. Do not resume production until after adding anti-strip to the asphalt binder. Determine the responsible party for the cost of the anti-strip in accordance with the Department and Contractor TSR values in Table 2360.2-10. If the Department is responsible for the cost of the anti-strip, the Department will only pay for the cost of the anti-strip for mixtures placed on that project. The Department will not pay for delay costs associated with making changes related to this testing.

<b>Table 2360.2-9 Mixture Type, Minimum TSR</b>			
<b>Traffic Level 2 – 3, %</b>		<b>Traffic Level 4 – 5, %</b>	
<b>Contractor</b>	<b>Department</b>	<b>Contractor</b>	<b>MnDOT</b>
75	65	80	70

<b>Table 2360.2-10 Anti-Strip Cost Responsibility</b>			
<b>Gyratory Level</b>	<b>Contractor TSR</b>	<b>MnDOT TSR</b>	<b>Responsibility</b>
2 – 3	≥ 75	≥ 65	No anti-strip required
		< 65	Contractor
	< 75	≥ 65	Department
		< 65	Contractor
4 – 5	≥ 80	≥ 70	No anti-strip required
		< 70	Contractor
	< 80	≥ 70	Department
		< 70	Contractor

Take another sample and test within the first 500 ton after production resumes. Stop production if the retest fails to meet the minimum specified value. Discuss a proposal to resolve the problem with the Engineer before resuming production. Do not operate below the specified minimum TSR if at least 2 successive tests fail the TSR requirements.

A new sample and retest are automatically required if a proportion changes by greater than 10 percent from the currently produced mixture for a single stockpile aggregate or the Engineer directs the Contractor to sample and retest.

**G.7.j Aggregate Specific Gravity ( $G_{sb}$ ) Laboratory Manual Methods 1204, 1205, 1815**

Sample and test aggregate stockpiles to verify aggregate specific gravity if directed by the Engineer in conjunction with the District Materials Engineer. Provide 90 lb. representative stockpile samples for each aggregate component. Split samples in half to provide material for both the Department and the Contractor. Label the Department companion with the following information:

- (1) Date,
- (2) Time,
- (3) Project number, and
- (4) Approximate cumulative tonnage to date.

Give the Department companion to the Department Street Inspector or Plant Monitor immediately after splitting or to the Materials Engineer within 24 hours of sampling as directed by the Engineer. The Materials Engineer will compare the aggregate specific gravity results to the Contractor's values on the current Mix Design Report. If the results deviate beyond the tolerance in accordance with Table 2360.2-6, "Allowable Differences between Contractor and Department Test Results", the Materials Engineer will

notify the Contractor and issue a new Mix Design Report with the current specific gravity results. Base new mixture placed after receiving notification of new specific gravity values on the Department results. The Engineer will notify the Contractor regarding new specific gravity values. The dispute resolution procedure for aggregate specific gravity is on the Bituminous Office website.

**G.7.k Moisture Content Laboratory Manual Method 1855**

Provide a mixture with moisture content no greater than 0.3 percent. Measure moisture content in the mixture behind the paver or, if approved by the Engineer, in the truck box. Sample and test as directed by the Engineer. Store the sample in an airtight container. Do not perform microwave testing.

Do not provide plant mixed asphalt with a moisture content greater than 0.3 percent.

**G.7.l Asphalt Binder Samples**

Obtain asphalt binder samples from a sampling valve located between the pump and the drum. Sample each type of asphalt binder used in mixture production after 50 tons of mixture has been produced, then sample at a rate of one per 250,000 gal. A minimum of 1 gallon of binder must be drawn and wasted from the sampling valve before the actual sample is drawn. For batch plants, obtain the asphalt binder sample from the weigh pod. Provide a 1 qt sized sample. The Inspector will monitor the sampling the Contractor performs. Record sample information on an Asphalt Sample Identification Card. Submit the sample to the Central Materials Laboratory. Contact the Department Chemical Laboratory Director for disposition of failing asphalt binder samples.

**G.8 Documentation**

Maintain documentation, including test summary sheets and control charts, on an ongoing basis. Maintain a file of gyratory specimen heights for gyratory compacted samples and test worksheets. File reports, records, and diaries developed during the work as directed by the Engineer. These documents become the property of the Department.

Number test results in accordance with the MDR and record on forms approved and provided by the Department.

**G.8.a Production Test Results**

Send production test results on test summary sheets to the District Materials Laboratory and to other sites as directed by the Engineer by 11 AM of the day following production by facsimile, or e-mail when approved by the Engineer.

Include the following production test results and mixture information on the Department approved test summary sheet:

- (1) Percent passing on all sieves in accordance with Table 3139.2-2 (including No. 16, No. 30, No. 50, No. 100),
- (2) Coarse and fine aggregate crushing,
- (3) Maximum specific gravity ( $G_{mm.}$ ),
- (4) Bulk specific gravity ( $G_{mb}$ ),
- (5) Percent total asphalt binder content ( $P_b$ ),
- (6) New added asphalt binder content,
- (7) Ratio of % new added asphalt binder to total asphalt binder,
- (8) Calculated production air voids ( $V_a$ ),
- (9) Calculated adjusted AFT (Adj. AFT),
- (10) Composite aggregate specific gravity ( $G_{sb}$ ) reflecting current proportions,
- (11) Aggregate proportions in use at the time of sampling,
- (12) Tons where sampled,
- (13) Tons represented by a test and cumulative tons produced,
- (14) Fines to effective asphalt ratio ( $F/A_e$ ),
- (15) Signature Line for MnDOT and Contractor Representative,
- (16) Mixture Moisture Content, and
- (17) MnDOT verification sample test result.
- (18) Identify, when used, the WMA additive or process and dosing rates.

Submit copies of failing test results to the Engineer on a daily basis.

**G.8.b Asphalt Manifest**

Provide the Engineer with asphalt manifests or bill of lading 's (BOL) on a daily basis.

Provide a daily plant diary, including a description of QC actions taken. Include changes or adjustments on the test summary sheets.

Provide weekly truck scale spot checks.

Provide a Department approved accounting system for mixes and provide a daily and final project summary of material quantities and types.

Provide a final hard and electronic copy of QC test summary sheets and control charts, and density worksheets at completion of bituminous operations on the project to the Engineer.

Provide an automated weigh scale and computer-generated weigh ticket. Ensure the ticket indicates the following information:

- (1) Project number,
- (2) Mix designation, including binder grade,
- (3) Mixture Design Report number,
- (4) Truck identification and tare, Truck tare weight is not required when the plant silo is equipped with a load cell to weigh the mixture independent of the truck weight. Truck tare weight is only required when a drive-over truck scale is utilized to determine the batch weight,
- (5) Net mass, and
- (6) Date and time of loading.

Do not include deviations from the minimum information on the computer-generated weigh ticket unless otherwise approved by the Engineer in writing.

Continue test summary sheets, charts, and records for a mixture produced at one plant site from contract to contract. Begin new summary sheets and charts annually for winter carry-over projects. Begin new summary sheets and charts when an asphalt plant is re-setup in the same location after it has moved out.

Furnish an electronic printout (long form recordation) from an automated plant blending control system at 20-minute intervals when the plant is producing mixture. The Engineer may waive this requirement if the plant does not have the capability to produce the automated blending control information; however, the Contractor must then perform daily spot checks to determine percent new asphalt added.

**G.8.c Drum Plants**

Include the following information on the plant control printout for Drum Plants:

- (1) Both the virgin and recycle belt feed rates (tons/hr),
- (2) Feeder bin proportions (%),
- (3) Total % asphalt cement in the mixture,
- (4) Virgin asphalt cement added (%)
- (5) Mixture Temperature °F,
- (6) Mixture code,
- (7) Date and time stamp, and
- (8) Current tons of mixture produced, and daily cumulative tons of mixture produced at time of printout.

Provide a daily electronic printout of the plant calibration (SPAN) numbers for each bin and meter.

**G.8.d Batch Plants**

Include the following information on the plant control printout for Batch Plants:

- (1) Both the virgin and recycle belt feed rates (tons/hr),
- (2) Feeder bin proportions (%),

- (3) Mixture Temperature °F,
- (4) Mixture code,
- (5) Date and time stamp, and
- (6) Current tons of mixture produced, and daily cumulative tons of mixture produced at time of printout.

Provide a daily electronic printout of the plant calibration (SPAN) numbers for each bin and meter.

**G.9 Control Charts**

Provide control charts and summary sheets computer generated from software approved by the Engineer.

The Contractor may use software available at the Bituminous Office website. Record the following data on standardized control charts:

- (1) Blended aggregate gradation, include sieves in accordance with Table 3139.2-2 for specified mixture;
- (2) Percent asphalt binder content ( $P_b$ );
- (3) Maximum specific gravity ( $G_{mm}$ );
- (4) Production air voids ( $V_a$ ); and
- (5) Adj. AFT.

Unless otherwise directed by the Engineer, plot individual test results for each test point and connect individual points with a solid line. Plot the moving average for each test variable starting with the fourth test and connect with a dashed line. Plot the Department’s QA and verification test results with triangles. Plot the specification JMF limits on the control charts using a dotted line.

**G.10 JMF Limits**

Base the production air voids and Adj. AFT on the minimum specified requirements in accordance with Table 2360.2-4, “Mixture Requirements”. Base gradations and asphalt binder content limits on the current Department reviewed Mixture Design Report. Provide gradation control sieves in accordance with Table 3139.2-2. Refer to the Mixture Design Report for the mixture production targets. JMF limits are the target plus or minus the limits in accordance with Table 2360.2-11, “JMF Limits (N=4)”. Use JMF limits as the criteria for acceptance of materials based on the moving average.

<b>Table 2360.2-11 JMF Limits (N=4)</b>	
Item	JMF Limits
Adj. AFT	- 0.5
Production air voids, %	$\pm 1.0$
Asphalt binder content, %	- 0.4
<i>Sieve, % passing:</i>	
1 in, ¾ in, ½ in, ⅜ in, No. 4	Broad band limits
No. 8 [2.36 mm]	Broad band limits
No. 200 [0.075 mm]	Broad band limits

**G.11 Moving Average Calculation**

Calculate a moving average as the average of the last four test results. Continue the calculation without interruption, except begin new summary sheets and charts annually for winter carry-over projects and if an asphalt plant is re-setup in the same site after it has been moved out.

**G.12 JMF Bands**

JMF Bands are the area between the target, as identified on the Mixture Design Report, and the JMF limits.

**G.13 JMF Adjustment**

Begin mixture production with aggregate proportions within 5 percent of the design proportions and mixture parameters in Table 2360.2-11 within the JMF limits shown. Use all the aggregate proportions included on the Mixture Design Report unless the aggregate proportion is shown as 0 percent. If the

Contractor provides the District Materials Laboratory with prior documented production data showing how production affects the mixture properties or if the Contractor provides the District Materials Laboratory with a written justification or explanation of material changes since the original mixture submittal waive the preceding requirements.

#### **G.13.a JMF Request for Adjustment**

The Contractor may make a request to the Bituminous Engineer or District Materials Engineer for a JMF adjustment to the mix design if the QC test results indicate a necessary change to achieve the specified properties. Do not use aggregates or materials not part of the original mix design to make adjustments unless otherwise approved by the Engineer, in conjunction with the District Materials Engineer or the Department Bituminous Engineer.

A Certified Level II Bituminous QM Mix Designer will review the requested change for the Department. If the request meets the design requirements in Table 3139.2-2, "Aggregate Gradation Broad Bands", Table 3139.2-3, "Mixture Aggregate Requirements", and Table 2360.2-4, "Mixture Requirements", the Department will issue a revised Mixture Design Report. Each trial mixture design submittal in accordance with 2360.2E, "Mixture Design" may have three JMF adjustments per mixture per project without charge.

Perform an interactive process with the Engineer before making JMF adjustments. Make JMF adjustments only within the mixture specification gradation design broadbands in accordance with Table 3139.2-2. Submit a new JMF if redesigning the mixture. Only reduce the JMF asphalt content if the moving average Adj. AFT is 8.5 $\mu$  or more and Individual Adjusted AFT is at least 7.5  $\mu$ .

The department will not allow consecutive requests for a JMF adjustment without production data. Continue calculation of the moving average after the approval of the JMF.

#### **G.13.b JMF Request for Adjustment for Proportion Change > 10%**

If requesting a JMF adjustment for a proportion change greater than 10 percent from the currently produced mixture for a single stockpile aggregate, provide supporting production test data from at least four tests run at an accelerated testing rate of one test per 500 ton [450 tonne] with the adjustment request. The Department will base acceptable verification and approval of the requested JMF on individual and moving average test results in addition to the requirements listed above. Individual test results must be within twice the requested JMF limits for percent asphalt binder, production air voids, and Adj. AFT. Individual gradations must be within the Broad Bands. The moving average values must be within the control limits in accordance with Table 2360.2-11. Continue to calculate the moving average after the change in proportions.

If the mixture meets the design requirements as discussed in 2360.2G.13.a, the District Materials Laboratory will sign the request for JMF adjustment effective from the point of the proportion change. If the mixture fails to meet the design requirements, the Department will either reduce the payment or direct the Contractor to remove and replace. Do not make consecutive requests for JMF adjustments without production data.

#### **G.13.c JMF Request for Adjustment When Cumulative Proportion Changes > 10%**

Submit a request for JMF adjustment when the cumulative change on any one product exceeds 10% from the original MDR. The Department will issue a revised MDR provided the mixture meets the requirements in Table 3139.2-2, "Aggregate Gradation Broad Bands", Table 3139.2-3, "Mixture Aggregate Requirements", and Table 2360.2-4, "Mixture Requirements".

#### **G.14 Failing Materials**

The Department will base material acceptance on individual and moving average test results. The Department will use isolated test results for acceptance of air voids at the start of mixture production. The Department will consider individual test results greater than two times the JMF bands as failing. The Department will fail moving average test results exceeding the JMF limits. Begin new summary sheets annually for winter carry-over projects.

Stop production and make adjustments if the moving average values exceed the JMF limits. Restart production after performing the adjustments and notifying the Engineer. Resume testing at the

accelerated rates and for the tests listed in Table 2360.2-7, "Production Start-Up Testing Rates", for the next 2,000 ton of mixture produced. Continue calculating the moving average after the stop in production.

The Department will consider mixture produced where the moving average of four exceeds the JMF limits as unsatisfactory in accordance with 2360.5B.7, "Moving Average Failure at Mixture Start-Up – Production Air Voids", 2360.5B.8, "Moving Average Failure at Mixture Start-Up — Adjusted AFT", 2360.5B-7, "Moving Average Failure – Production Air Voids", and 2360.5B.10, "Moving Average Failure — Percent Asphalt Binder Content, Gradation, and Adj. AFT".

If the total production of a mixture type for the entire project requires no greater than four tests the Department will accept the material in accordance with 2360.2G.14.b, "Isolated Failures at Mixture Start-Up — Production Air Voids", and 2360.5B.6, "Individual Failure — Gradation, Percent Asphalt Binder, Production Air Voids, and Adj. AFT".

**G.14.a Ratio of New Added Asphalt Binder to Total Asphalt Binder – Acceptance Criteria**

Minimum design ratio of new added asphalt binder to total asphalt binder is shown in Table 2360.2-12 below. During production the ratio must meet individual and moving average requirements as listed in Table 2360.2-12, "Ratio of New Added Asphalt Binder to Total Asphalt Binder Acceptance Criteria". If the individual or moving average ratio drops below the minimum requirement, the Contractor must stop production and make adjustments to correct the process. Restart production only after notifying the Engineer of the adjustments made. The calculation of the moving average will continue after the stop in production.

<b>Table 2360.2-12</b>			
<b>Ratio of New Added Asphalt Binder to Total Asphalt Binder Acceptance Criteria</b>			
Specified Asphalt Grade	Recycled Material		
	RAS Only	RAS + RAP	RAP Only
PG 58 <sup>1</sup> X-28, PG 52S-34, PG 49-34, PG 64S-22			
Wear (ind./moving average)	66/70	66/70	66/70
Non-Wear (ind./moving average)	66/70	66/70	61/65
PG 58X <sup>1</sup> -34			
Wear & Non-Wear (ind./moving average)	76/80	76/80	76/80
<sup>1</sup> X=S, H,V,E			

**G.14.b Isolated Failures at Mixture Start-Up – Production Air Voids**

At the start-up of mixture production, use the first three isolated test results for production air voids before establishing a moving average of four. Calculate isolated production air voids using the maximum mixture specific gravity and the corresponding bulk specific gravity from that single test. After testing four samples and establishing a moving average of four, the Department will base acceptance on individual and moving average production air voids.

The Department will not accept the material if any of the first three isolated test results for production air voids exceeds twice the JMF bands from the target listed on the Mixture Design Report at the start of production.

**2360 - TTWE SPECIAL BITUMINOUS MIXTURES (PRICE SCHEDULE ITEM 8)**

This work will consist of constructing a thin wearing course of plant-mixed asphalt on a prepared surface in accordance with the lines, grades, thickness, and typical cross sections shown on the plans or established by the Engineer.

Mix Designation for this mixture is as follows: TTWESpecial

**MATERIALS**

- A. The aggregate must consist of 100% taconite tailings. The use of recycled asphalt pavement (RAP) is not allowed.
- B. Aggregate Gradation

<b>Taconite Tailings Gradation</b>	
Sieve Size	Percent Passing
1/2"	100
3/8"	90 – 100
No. 4	60 – 100
No. 10	50 – 90
No. 40	5 – 40
No. 200	0 – 5

- C. Taconite Tailings  
Obtain taconite tailings from ore mined westerly of a north-south line located east of Biwabik, Minnesota (R15W-R16W) or from ore mined in southwestern Wisconsin.
- D. Asphalt Binder PG 58-28

**DESIGN**

TT mixes will contain a minimum of 7% asphalt binder by total weight of the mixture.

**SPECIFICATION REQUIREMENTS FOR CRACK AND JOINT SEALERS**

**3719 - HOT-POURED, CRUMB-RUBBER TYPE CRACK SEALER**

**3719.1 SCOPE**

Provide hot-poured, crumb-rubber type crack sealer for sealing cracks in concrete and bituminous pavements and miscellaneous structures.

**3719.2 REQUIREMENTS**

Provide crack sealer material meeting the following requirements:

- (1) On the Approved/Qualified Products List,
- (2) Consists of asphalt and crumb rubber blended together by the manufacturer to produce a homogeneous mixture,
- (3) When melted, the sealer does not separate or settle, and
- (4) Uniform consistency suitable for filling joints and cracks without inclusion of large air holes or discontinuities.

**A Physical Requirements**

Provide crack sealer meeting the requirements of ASTM D 6690, Type I with the following modifications in Table 3719.2-1 after one cycle of heating to the manufacturer's maximum heating temperature, cooling, and reheating to the manufacturer's maximum heating temperature.

<b>Table 3719.2-1 ASTM D 6690, Type I Modifications</b>	
<b>Test</b>	<b>Specification</b>
Recycled rubber, mass	≥ 18% of asphaltic components
Bond Test, 50% extension at 0 °F [-18 °C] *	No adhesion or cohesion bond failure after 5 cycles
Resilience at 77 °F [25 °C]	≥ 40%
Softening point	≥ 180 °F [82 °C]
Use sawed cement mortar blocks or asphalt HMA blocks prepared using the method found in the Laboratory Manual.	

**B Packaging and Marking**

Package and ship the sealer material in boxes weighing no greater than 50 lb. [23 kg]. Mark the boxes with the following information:

- (1) Material name,
- (2) Manufacturer name,
- (3) Brand name,
- (4) Weight,
- (5) Batch number, and
- (6) Maximum heating temperature recommended by the manufacturer.

**3719.3 SAMPLING AND TESTING**

**A Sampling**

Provide samples at rates and sizes meeting the requirements of the Schedule of Materials Control or as required by the contract.

The Engineer, in conjunction with the Materials Engineer, will perform tests on samples taken from the product proposed for use. Submit to the Engineer a manufacturer’s Certificate of Compliance for each sealer batch.

**B Methods of Test**

Perform tests meeting the requirements of ASTM D5329, except, perform the bond test using sawed cement mortar blocks or asphalt HMA blocks (consistent with the pavement type) prepared in accordance with the methods in the Laboratory Manual.

**3723 - JOINT AND CRACK SEALER (HOT-POURED ELASTIC TYPE)**

**3723.1 SCOPE**

Provide hot-poured elastic type joint and crack sealer to seal joints and cracks in concrete and bituminous pavements, bridges, and other structures.

**3723.2 REQUIREMENTS**

Provide a sealant material meeting the following requirements:

- (1) Listed on the Approved/Qualified Products List.
- (2) Composed of a combination of polymeric materials, fully reacted chemically to form a homogeneous compound.
- (3) When melted, ensure the sealant does not separate or settle and ensure the sealant does not contain a dispersed or settling component, and
- (4) Maintains a uniform consistency to seal joints and cracks without large air holes or discontinuities.

**A Physical Requirements**

Provide sealant meeting the requirements of ASTM D6690, Type II and the following modifications:

<b>Table 3723.2-1 ASTM D6690, Type II Modifications</b>	
<b>Test</b>	<b>Requirement</b>
Cone penetration at 77 °F [25 °C], 150 g, 5 s	60 – 90 dmm

<b>Table 3723.2-1 ASTM D6690, Type II Modifications</b>	
<b>Test</b>	<b>Requirement</b>
Bond at -20 °F [-29 °C], 3 cycles, 100% extension	No adhesion or cohesion bond failure after 3 cycles
Mandrel bend test at -29 °F [-34 °C], 1 in [25 mm] mandrel	No cracking
Resilience at 77 °F [25 °C]	≥ 40%

**B Packaging and Marking**

Package and ship the sealant material in boxes no greater than 50 lb. [23 kg]. Mark the containers with the following information:

- |                        |  |
|------------------------|--|
| (1) Material name,     | (4) Weight   |
| (2) Manufacturer name, | (5) Batch number, and  |
| (3) Brand name,        | (6) Maximum heating temperature, as recommended by the manufacturer. |

**3723.3 SAMPLING AND TESTING**

**A Sampling**

Provide samples in rates and sizes meeting the requirements of the Schedule of Materials Control, or as required by the contract.

The Engineer, in conjunction with the Materials Engineer, will perform tests on samples taken from the product proposed for use. Submit to the Engineer a manufacturer’s Certificate of Compliance with each sealant batch.

**B Methods of Test**

**B.1 Bond Test**

Perform tests meeting the requirements of ASTM D5329, except perform the bond test using sawed cement mortar blocks or asphalt HMA blocks (consistent with the pavement type) prepared using the methods found in the Laboratory Manual.

**B.2 Mandrel Bend Test ASTM D522, Method B**

The Engineer, in conjunction with the Materials Engineer, will perform the Mandrel Bend Test at -29 °F [-34 °C] using a 1 in [25 mm] mandrel, bending the specimen 180° over 5 s. The Engineer will prepare test specimens meeting the requirements of ASTM D6690, Type II, Flow Test, and condition the specimens at -29 °F [-34 °C] for at least 4 h.

**3725 - HOT-POURED, EXTRA LOW MODULUS, ELASTIC TYPE JOINT AND CRACK SEALER**

**3725.1 SCOPE**

Provide hot-poured, extra low modulus, elastic type joint and crack sealer to seal joints in concrete pavement, bridges, other structures and rout and seal applications on bituminous pavements.

**3725.2 REQUIREMENTS**

Provide a sealant material meeting the following requirements:

- (1) Listed on the MnDOT Approved Products List,
- (2) Composed of a combination of polymeric materials, fully reacted chemically to form a homogeneous compound,
- (3) When melted, ensure the sealant does not separate or settle, and
- (4) Maintains a uniform consistency to seal joints and cracks without inclusion of large air holes or discontinuities.

**A Physical Requirements**

Provide sealant meeting the requirements of ASTM D6690 Type IV with the following modifications in Table 3725.2-1.

<b>Table 3725.2-1 ASTM D6690 Type IV Modifications</b>	
<b>Test</b>	<b>Requirement</b>
Cone Penetration at 77° F [25° C], ASTM D5329	100 – 150 dmm
Cone Penetration at 0° F [-18° C], ASTM D5329 modified	≥ 25 dmm
Resilience, ASTM D5329	30% – 60%
NOTE: Ensure the material meets the requirements of Table 3725.2-1 after heating for 6 h with constant mixing in a laboratory melter at the manufacturer's maximum heating temperature.	

**B Packaging and Marking**

Package and ship the sealant material in boxes weighing no greater than 50 lb. [23 kg]. Mark the boxes with the following information:

- |                        |  |
|------------------------|--|
| (1) Material name,     | (4) Weight,  |
| (2) Manufacturer name, | (5) Batch number, and  |
| (3) Brand name,        | (6) Maximum heating temperature recommended by the manufacturer. |

**3725.3 SAMPLING AND TESTING**

Provide samples at rates and sizes meeting the requirements of the Schedule of Materials Control or as required by the contract.

The Engineer in conjunction with the Materials Engineer will perform tests on samples taken from the product proposed for use. The Contractor will provide manufacturer's Certificate of Compliance as specified in 1603 with each sealant batch.

**B Methods of Test**

Perform tests meeting the requirements of ASTM D5329, except perform the bond test using sawed cement mortar blocks or asphalt HMA blocks [consistent with the pavement type] prepared using the methods found in the MnDOT Lab.

**END OF SPECIFICATIONS**

**BITUMINOUS MATERIALS CONTRACT VENDOR INFORMATION.**

Contract users should print out and attach appropriate county price lists before providing printed copies of this Contract Release to end users without access to a computer and the OSP website.

The following is a list of all the Contract Vendors available to provide bituminous materials by county:

<u>CONTRACT VENDOR</u>	<u>CONTRACT NO.</u>	<u>TERMS</u>	<u>DELIVERY</u>
<b>AGASSIZ ASPHALT LLC</b> 67 State Street Newfolden, MN 56738	<b>216762</b>	<b>NET 30</b>	<b>PICK UP ONLY</b>
<b>VENDOR NO.:</b> 0000979617	<b>CONTACT:</b> Kevin Davidson or Austin Odberg <b>Email:</b> <a href="mailto:agassizasphalt@wikel.com">agassizasphalt@wikel.com</a>		<b>PHONE:</b> 218-449-4865
<b>COUNTIES:</b> Red Lake			
<b>BITUMINOUS PAVING, INC.</b> PO Box 6 Ortonville, MN 56278-0006	<b>211534</b>	<b>NET 30</b>	<b>PICK UP ONLY</b>
<b>VENDOR NO.:</b> 0000204163	<b>CONTACT:</b> Bill Bajari <b>Email:</b> <a href="mailto:billb@bpimn.com">billb@bpimn.com</a>		<b>PHONE:</b> 320-273-2113 <b>FAX:</b> 320-273-2120
<b>COUNTIES:</b> Big Stone			
<b>DUININCK INCORPORATED</b> 408 6th Street Prinsburg, MN 56281	<b>211892</b>	<b>NET 30</b>	<b>PICK UP ONLY</b>
<b>VENDOR NO.:</b> 0000198793	<b>CONTACT:</b> Kristopher Duinck <b>Email:</b> <a href="mailto:kristopherd@duinck.com">kristopherd@duinck.com</a>		<b>PHONE:</b> 320-978-6011 <b>FAX:</b> 320-978-4978
<b>COUNTIES:</b> Kandiyohi, Lyon, Nobles & Wright			
<b>HAWKINSON CONSTRUCTION COMPANY, INC.</b> 501 W County Rd 63 Grand Rapids, MN 55744	<b>211893</b>	<b>NET 30</b>	<b>PICK UP ONLY</b>
<b>VENDOR NO.:</b> 0000197558	<b>CONTACT:</b> Brian Anderson <b>Email:</b> <a href="mailto:brian@hawkinsonconstruction.com">brian@hawkinsonconstruction.com</a>		<b>PHONE:</b> 218-326-0309
	<b>CONTACT:</b> Steph Warren <b>Email:</b> <a href="mailto:steph@hawkinsonconstruction.com">steph@hawkinsonconstruction.com</a>		<b>PHONE:</b> 218-326-0309
<b>COUNTIES:</b> Itasca			

<u>CONTRACT VENDOR</u>	<u>CONTRACT NO.</u>	<u>TERMS</u>	<u>DELIVERY</u>
<b>MARK LEE ASPHALT &amp; PAVING INC.</b> 707 Van Dyke Rd Alexandria, MN 56308	<b>211525</b>	<b>NET 30</b>	<b>PICK UP ONLY</b>
<b>VENDOR NO.:</b> 0000823301	<b>CONTACT:</b> Mark Lee Email: <a href="mailto:mle@wisper-wireless.com">mle@wisper-wireless.com</a>	<b>PHONE:</b>	320-763-5410
	<b>CONTACT (PO Order):</b> Suzanne Bertrand Email: <a href="mailto:estimates@markleeasphalt paving.com">estimates@markleeasphalt paving.com</a>	<b>FAX:</b> <b>PHONE:</b>	320-763-9323 320-763-9343

**COUNTIES:** Douglas

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<b>MESABI BITUMINOUS, INC.</b> PO Box 728 Gilbert, MN 55741	<b>216765</b>	<b>NET 30</b>	<b>PICK UP ONLY</b>
<b>VENDOR NO.:</b> 0000206410	<b>CONTACT:</b> Tom Nemanich Email: <a href="mailto:mesabituminous@accessmn.com">mesabituminous@accessmn.com</a>	<b>PHONE:</b>	218-741-8291

**COUNTIES:** St. Louis

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<b>VALLEY ASPHALT PRODUCTS, INC.</b> 2020 N. Spring Street PO Box 787 New Ulm, MN 56073-0787	<b>245815</b>	<b>NET 30</b>	<b>PICK UP ONLY</b>
<b>VENDOR NO.:</b> 0000196395	<b>CONTACT:</b> Mathew J. Mathiowetz Email: <a href="mailto:mattm@mrpaving.com">mattm@mrpaving.com</a>	<b>PHONE:</b> <b>FAX:</b>	507-354-4171 507-359-4156

**COUNTIES:** Brown

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<b>NORTHERN PAVING, INC.</b> 49361 US 71 Bemidji, MN 56601	<b>211520</b>	<b>NET 30</b>	<b>PICK UP ONLY</b>
<b>VENDOR NO.:</b> 0000983969	<b>CONTACT:</b> Amber Schulke Email: <a href="mailto:npquotes@outlook.com">npquotes@outlook.com</a>	<b>PHONE:</b> <b>FAX:</b>	218-333-8888 218-759-1030

**COUNTIES:** Hubbard

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<b>OPP CONSTRUCTION LLC.</b> PO Box 13530 Grand Forks, ND 58208	<b>211536</b>	<b>NET 30</b>	<b>PICK UP ONLY</b>
<b>VENDOR NO.:</b> 0000198989	<b>CONTACT:</b> Greg Opp Email: <a href="mailto:gregopp@oppconstruction.com">gregopp@oppconstruction.com</a>	<b>PHONE:</b> <b>FAX:</b>	701-739-3322 701-795-7020

**COUNTIES:** Polk

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<u>CONTRACT VENDOR</u>	<u>CONTRACT NO.</u>	<u>TERMS</u>	<u>DELIVERY</u>
<b>PINE BEND PAVING COMPANY, INC.</b>	<b>216768</b> <b>NET 30</b>	<b>PICK UP ONLY</b>	

Contract Release: B-357(5)

PO Box 72  
Vermillion, MN 55085

**VENDOR NO.:** 0000204377

**CONTACT:** Richard Jacoby  
**Email:** [rjacoby@pinebendpaving.com](mailto:rjacoby@pinebendpaving.com)

**PHONE:** 612-919-0374

**CONTACT (PO Order):** Robin Hague  
**Email:** [rhague@pinebendpaving.com](mailto:rhague@pinebendpaving.com)

**PHONE:** 651-437-2333

**COUNTIES:** Dakota

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**SBS BLACKTOP SERVICE INC.**  
11656 Townline Rd  
Hibbing, MN 55746

**211522**

**5% in 10, NET 30**

**PICK UP ONLY**

**VENDOR NO.:** 0000972926

**CONTACT:** Tony Novak  
**Email:** [sbsblacktop@yahoo.com](mailto:sbsblacktop@yahoo.com)

**PHONE:** 218-262-3769

**CONTACT (PO Oder):** Derik Sabin  
**Email:** [sbsblacktop@yahoo.com](mailto:sbsblacktop@yahoo.com)

**FAX:** 218-263-1489  
**PHONE:** 218-969-0195

**COUNTIES:** St. Louis

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**MARTIN MARIETTA MATERIALS**  
PO Box 30013  
Raleigh, NC 27622

**230933**

**NET 30**

**PICK UP ONLY**

**VENDOR NO.:** 0000323115

**CONTACT:** Christopher Benson  
**Email:** [christopher.benson@martinmarietta.com](mailto:christopher.benson@martinmarietta.com)

**PHONE:** 763-424-5400

**COUNTIES:** Anoka, Carver, Chisago, Dakota, Hennepin, Ramsey, Scott, Sherburne, Washington, Wright

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**WADENA ASPHALT INC.**  
11394 Leaf River Road  
PO Box 603  
Wadena, MN 56482

**216770**

**NET 30**

**PICK UP ONLY**

**VENDOR NO.:** 0000192700

**CONTACT:** Tom Marquette  
**Email:** [218asphalt@gmail.com](mailto:218asphalt@gmail.com)

**PHONE:** 218-631-1606

**COUNTIES:** Wadena

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**W W BLACKTOPPING INC.**  
700 Industrial Road  
Mankato, MN 56001

**216763**

**NET 30**

**PICK UP ONLY**

**VENDOR NO.:** 0000207801

**CONTACT:** Mitchell Wolff  
**Email:** [mitch@wwblacktopping.com](mailto:mitch@wwblacktopping.com)

**PHONE:** 507-387-1518

**COUNTIES:** Blue Earth

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**COUNTY COVERAGE:** The following is a list of the counties and Contract Vendors providing bituminous materials within the county. Click on the county name below to view Contract Vendors pricing for that county.

**COUNTY**

**CONTRACT VENDOR**

AITKIN

*No Vendors; check adjacent counties.*

[ANOKA](#)

Martin Marietta Materials

BECKER

*No Vendors; check adjacent counties.*

BELTRAMI

*No Vendors; check adjacent counties.*

BENTON

*No Vendors; check adjacent counties.*

[BIG STONE](#)

Bituminous Paving, Inc.

[BLUE EARTH](#)

W W Blacktopping, Inc.

[BROWN](#)

Valley Asphalt Paving, Inc.



<u>COUNTY</u>	<u>CONTRACT VENDOR</u>
RICE	<i>No Vendors; check adjacent counties.</i>
ROCK	<i>No Vendors; check adjacent counties.</i>
ROSEAU	<i>No Vendors; check adjacent counties.</i>
<a href="#">SCOTT</a>	Martin Marietta Materials
<a href="#">SHERBURNE</a>	Martin Marietta Materials
SIBLEY	<i>No Vendors; check adjacent counties.</i>
<a href="#">ST. LOUIS</a>	SBS Blacktop Service, Inc., Mesabi Bituminous, Inc.
STEELE	<i>No Vendors; check adjacent counties.</i>
STEVENS	<i>No Vendors; check adjacent counties.</i>
SWIFT	<i>No Vendors; check adjacent counties.</i>
TODD	<i>No Vendors; check adjacent counties.</i>
TRaverse	<i>No Vendors; check adjacent counties.</i>
WABASHA	<i>No Vendors; check adjacent counties.</i>
<a href="#">WADENA</a>	Wadena Asphalt, Inc.
WASECA	<i>No Vendors; check adjacent counties.</i>
<a href="#">WASHINGTON</a>	Martin Marietta Materials
WATONWAN	<i>No Vendors; check adjacent counties.</i>
WILKIN	<i>No Vendors; check adjacent counties.</i>
WINONA	<i>No Vendors; check adjacent counties.</i>
<a href="#">WRIGHT</a>	Duininck, Incorporated, Martin Marietta Materials
YELLOW MEDICINE	<i>No Vendors; check adjacent counties.</i>

## CRACK AND JOINT SEALERS CONTRACT VENDOR INFORMATION.

The following is a list of all the Contract Vendors available to provide crack and joint sealer for pick up and/or delivery:

<u>CONTRACT VENDOR</u>	<u>CONTRACT NO.</u>	<u>TERMS</u>	<u>DELIVERY</u>
<b>BITUMINOUS PAVING, INC.</b> PO Box 6 Ortonville, MN 56278-0006	<b>211534</b>	<b>NET 30</b>	<b>PICK UP ONLY</b>
<b>VENDOR NO.:</b> 0000204163	<b>CONTACT:</b> Bill Bajari <b>Email:</b> <a href="mailto:billb@bpimn.com">billb@bpimn.com</a>	<b>PHONE:</b> <b>FAX:</b>	320-273-2113 320-273-2120
<b>DELIVERY ORIGIN:</b> Bituminous Paving, Inc., 43153 66th Ave, Odeessa, MN 56276			
<b>BITUMINOUS PAVING INC CRACK &amp; JOINT SEALER PRICING 2024</b>			

[https://osp.admin.mn.gov/sites/osp/files/2024-03/b-3575bituminouspaving\\_211534\\_p2024.pdf](https://osp.admin.mn.gov/sites/osp/files/2024-03/b-3575bituminouspaving_211534_p2024.pdf)

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Contract Release: B-357(5)

<u>CONTRACT VENDOR</u>	<u>CONTRACT NO.</u>	<u>TERMS</u>	<u>DELIVERY</u>
<b>CRAFCO, INC</b> 6250 Brook Hollow Parkway, Suite 100 Norcross, GA 30071	<b>264240</b>	<b>NET 30</b>	<b>FOR PICK UP OR DELIVERY</b>

<b>VENDOR NO.:</b> 0000252634	<b>CONTACT:</b> Darrin Nystrom <b>Email:</b> <a href="mailto:darrin.nystrom@whitecap.com">darrin.nystrom@whitecap.com</a>	<b>PHONE:</b> 651-398-1740 <b>FAX:</b> 320-251-2763
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**DELIVERY ORIGINS:**

Crafco Inc. 121 Industrial Park Rd, Halls, TN 38040  
Crafco Inc. 325 Road 128A, Cheyenne, WY 82007  
Crafco Inc. 234 Harvestore Drive, Dekalb, IL 60115  
Brock White Company, 2575 Kasota Ave, St Paul, MN 55108  
Brock White Company, 12785 Elk Lake Rd (County Rd 1), Elk River, MN 55330  
Brock White Company, 580 41st Ave North, St. Cloud, MN, 56303  
Brock White Company, 6784 10th Ave SW, Rochester, MN, 55902  
Brock White Company, 3855 Independence Rd, Suite 100, Baxter, MN, 56425  
Brock White Company, 4231 West 1st St Duluth, MN, 55807  
Brock White Company, 818 E 50th Street N, Sioux Falls, SD, 57104  
Brock White Company, 1425 41st Street N, Fargo, ND, 58102

**CRAFCO PRICING 2023**

<https://osp.admin.mn.gov/sites/osp/files/2024-04/b-3575whitecappricing2024.pdf>

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<b>FPT INFRASTRUCTURE, DIVISION OF FIBRECRETE PRESERVATION TECHNOLOGIES, INC.</b> 401 Old US 52 South Mount Airy, NC 27030	<b>212090</b>	<b>NET 30</b>	<b>FOR PICK UP OR DELIVERY</b>
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<b>VENDOR NO.:</b> 00001100978	<b>CONTACT:</b> Marcy Ream <b>Email:</b> <a href="mailto:marcy.ream@fptinfrastructure.com">marcy.ream@fptinfrastructure.com</a>	<b>PHONE:</b> 330-705-3417
	<b>CONTACT (PO Order):</b> Keith Miller <b>Email:</b> <a href="mailto:keith.miller@fptinfrastructure.com">keith.miller@fptinfrastructure.com</a>	<b>PHONE:</b> 336-479-3149

**DELIVERY ORIGIN:**

FPT Infrastructure, Inc., 401 Old US 52 S, Mount Airy, NC 27030

**FPT INFRASTRUCTURE INC CRACK & JOINT SEALER PRICING 2025**

<https://osp.admin.mn.gov/sites/osp/files/2025-05/b-3575fptinfrastructurecrackjointsealerpricing2025.pdf>

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Contract Release: B-357(5)

<u>CONTRACT VENDOR</u>	<u>CONTRACT NO.</u>	<u>TERMS</u>	<u>DELIVERY</u>
<b>HAWKINSON CONSTRUCTION COMPANY, INC.</b> 501 W County Rd 63 Grand Rapids, MN 55744	211893	NET 30	PICK UP ONLY

**VENDOR NO.:** 0000197558      **CONTACT:** Brian Anderson  
**Email:** [brian@hawkinsonconstruction.com](mailto:brian@hawkinsonconstruction.com)      **PHONE:** 218-326-0309

**CONTACT (PO Order):** Steph Warren      **PHONE:** 218-326-0309  
**Email:** [steph@hawkinsonconstruction.com](mailto:steph@hawkinsonconstruction.com)

**DELIVERY ORIGIN:**  
Hawkinson Construction Company, Inc., 501 W County Rd 63, Grand Rapids, MN 55744

**HAWKINSON CONSTRUCTION COMPANY INC CRACK & JOINT SEALER PRICING 2022**

<https://osp.admin.mn.gov/sites/osp/files/2024-10/b-3575hawkinsonconstructioncompanycrackjointsealerpricing2022.pdf>

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<b>MIDSTATES EQUIPMENT &amp; SUPPLY INC.</b> 606 County Rd #1 Mountain Lake, MN 56159	211529	NET 30	FOR PICK UP OR DELIVERY
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**VENDOR NO.:** 0000225391      **CONTACT:** Jacquelyn Strom  
**Email:** [midstates@midstatesequipment.net](mailto:midstates@midstatesequipment.net)      **PHONE:** 507-427-3807

**CONTACT (PO Order):** Abby Bargaen      **FAX:** 507-427-3709  
**Email:** [abbyb@midstatesequipment.net](mailto:abbyb@midstatesequipment.net)      **PHONE:** 800-929-3807 x1223  
or x1243

**DELIVERY ORIGIN:**  
Midstates Equipment & Supply Inc., 606 County Rd #1, Mountain Lake, MN 56159  
Maxwell Products, Inc., 650 Delong St, Salt Lake City, UT 84104

**MIDSTATES EQUIPMENT & SUPPLY INC CRACK & JOINT SEALER PRICING 2023**

<https://osp.admin.mn.gov/sites/osp/files/2023-05/b-3575midstatespricing2023.pdf>

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Contract Release: B-357(5)

**CONTRACT VENDOR**

**UNIQUE PAVING MATERIAL**  
3993 E 93rd Street  
Cleveland, OH 44105

**CONTRACT NO.**

**211528**

**TERMS**

**NET 30**

**DELIVERY**

**PICK UP ONLY**

**VENDOR NO.:** 0000249595

**CONTACT:** Michael A Pemberton  
**Email:** [bids@uniquepavingmaterials.com](mailto:bids@uniquepavingmaterials.com)

**PHONE:** 216-441-4880  
**FAX:** 216-341-8514

**CONTRACT (PO Order):** Betsy Kasperek  
Karin Deeb  
**EMAIL:** [CS@uniquepavingmaterials.com](mailto:CS@uniquepavingmaterials.com)

**DELIVERY ORIGINS:**

Hallet Dock - 3200 Winter St. Superior, WI 55807

WM Mueller & Sons, 14060 County Rd 40 Carver, MN 55315

Plaisted Co, 11555 205th Ave NW, Elk River, MN 55330

Red Rock Quarry, 48511 270th St, Jeffers, MN 56083

T.A. Schifsky, 2370 Hwy 36 E, St Paul, MN 55109

WW Blacktopping, 700 Industrial Rd, Mankato, MN 56001

**UNIQUE PAVING MATERIAL CRACK & JOINT SEALER PRICING 2023**

<https://osp.admin.mn.gov/sites/osp/files/2023-05/b-3575uniquepavingpricing2023.pdf>

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**BITUMINOUS MATERIAL SWIFT CONTRACT ITEM LINES:**

- [LINE 1] BITUMINOUS MATERIAL – PICK UP ONLY. (Type the line-item number(s) and corresponding description(s) in the commodity line item description field on the order.)
- [LINE 2] ASPHALT MATERIAL – PICK UP ONLY. (Type the line-item number(s) and corresponding description(s) in the commodity line item description field on the order.)

**BITUMINOUS MATERIAL SWIFT CONTRACT CATEGORY LINES:**

- [LINE 1] Category # 30121500 - Bituminous derivatives
- [LINE 2] Category # 30121600 – Asphalts

**CRACK & JOINT SEALER SWIFT CONTRACT ITEM LINES:**

- [LINE 1] CRACK & JOINT SEALER MATERIALS - DELIVERED FROM ORIGIN, WY (Type item #s & description(s) in line-item description field. Add delivery charge based on total loaded mile from Contract Vendor's location to agency's receiving point.)

**CRACK & JOINT SEALER SWIFT CONTRACT CATEGORY LINES:**

- [LINE 1] Category # 30121500 - Bituminous derivatives

**REVISIONS:**

- 05.01.2025 Contract #212090 and 216770 extended through April 30, 2026, with revised pricing. Contract #216765 extend through April 30, 2026, at the same prices, terms, and conditions.
- 04.22.2025 Contract #211520, 211522, 211525, 211528, 211529, 211534, 211536, 211892, 211893, 216762, 216763, 216768, 230933, and 245815 extended until April 30, 2026, at the same prices, terms, and conditions.
- 03.12.2025 Assignment agreement with White Cap executed to assign the contract to Crafc0, Inc., with a new contract number of 264240. Crafc0, Inc. extended through 04/30/2026 at the same prices, terms, and conditions.
- 02.25.2025 Administrative change to update Valley Asphalt Product, Inc., email address.
- 05.08.2024 Contract with Agassiz Asphalt extended through 04/30/2025, at the same prices, terms and conditions.
- 04.24.2024 Contract with Mesabi Bituminous, Inc., and Valley Asphalt Products, Inc., extended through 04/30/2025, at the same prices, terms, and conditions.
- 04.19.2024 Contract with Northern Paving, FPT Infrastructure, and Hawkinson Construction Company, Inc. extended through 04/30/2025, at the same prices, terms and conditions.  
Contract with White Cap extended with revised pricing, existing terms and conditions remain the same.  
Assignment agreement with M.R. Paving & Excavating, Inc. executed to assign the contract to Valley Asphalt Products, Inc., with a new contract number of 245815.
- 03.26.2024 Contract with Duininc, Inc., Mark Lee Asphalt & Paving, Inc., OPP Construction LLC, Pine Bend Paving Company, Inc., SBS Blacktop Service, Inc., Marin Marietta Materials, Wadena Asphalt Inc., Midstates Equipment & Supply Inc., and Unique Paving Material extended through April 30, 2025, at the same prices, terms, and conditions.  
Bituminous Paving, Inc. extended through April 30, 2025, with revised pricing.
- 11.06.2023 AMS/Buyer changed from Mai N Lor to Staci Stoerzinger.
- 07.11.2023 AMS/Buyer changed from Tou Yang to Mai N Lor.
- 06.21.2023 Assignment agreement with Tiller Corporation executed to assign the contract to Martin Marietta Materials with a new contract number of 230933. Contract 230933 is extended through 4/30/24 at the same prices, terms, and conditions.
- 06.13.2023 Assignment agreement with Brock White executed to assign the contract to White Cap with a new contract number of 229195. Contract 229195 is extended through 4/30/24 at the same prices, terms, and conditions.
- 05.25.2023 Contract with Northern Paving extended through 4/30/24 at the same prices, terms, and conditions.
- 05.16.2023 Updated contract release to remove the price schedules for Aitkin, Hubbard, Olmsted, Rice, and Winona counties.
- 05.03.2023 Contract with Brock White Company and Pine Bend Paving Company extended through 4/30/24 at the same prices, terms, and conditions.
- 04.28.2023 Contract with Unique Paving Material and Midstates Equipment & Supply extended through 4/30/24 at revised pricing with same terms and conditions.
- 04.13.2023 Contract with Hawkinson Construction and Bituminous Paving extended through 4/30/24 at the same, terms, and conditions.
- 04.12.2023 Contract with Duininc extended through 4/30/24 at the same prices, terms, and conditions.
- 04.10.2023 Contract with OPP Construction, SBS Blacktop Service, Mark Lee Asphalt & Paving and Fibrecrete Preservation Technology extended through 4/30/24 at the same prices, terms, and conditions.
- 03.28.2023 New contract with Pine Bend Paving Company has been executed.
- 02.23.2023 Brock White Company's contract prices has been revised to update new pricing

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- 01.24.2023 Contract with Agassiz Asphalt and Mesabi Bituminous extended through 4/30/2024 at the same prices, terms, and conditions.
- 01.17.2023 Contract with Wadena Asphalt extended through 4/30/2024 at the same terms, conditions, and revised pricing.
- 01.11.2023 Contract with W W Blacktopping extended through 4/30/24 at the same prices, terms, and conditions.
- 01.05.2023 Contract with M.R. Paving & Excavating and Tiller Corporation dba Martin Marietta Materials extended through 4/30/24 at the same prices, terms, and conditions.
- 01.04.2023 Updated MidStates Equipment & Supply product Elastoflex numbers from 52 to 410.
- 08.18.2022 New contract with Agassiz Asphalt, M.R. Paving & Excavating, Mesabi Bituminous, Tiller Corporation dba Martin Marietta, Wadena Asphalt and WW Blacktopping has been executed.