

2/5/03

BITUMINOUS PAVEMENT 5 YEAR WARRANTY (For Calendar Year 2004)

Specifications 2350/2360 are modified to include the following:

A. Description. Bituminous Pavement 5 Year Warranty

A.1. General. This work consists of the construction and warranty of a new or reconstructed bituminous pavement conforming to the lines and grades shown on the plans. The contractor will establish the job mix formula, select materials, and be responsible for the pavement performance and warranty work on the finished pavement for five years following completion of the bituminous pavement in accordance with Mn/DOT Specification 2350/2360 and the following provisions. This warranty work applies to all bituminous mixtures placed under the warranted bituminous pavement bid items. All provisions of Mn/DOT Specification 2350/2360 apply except as modified by these warranty provisions.

A.2. Definitions and Terms

Final Warranted Pavement Construction Acceptance (FCA). The date when the warranted pavement construction is complete and open to public traffic without restrictions. This date constitutes the start of the warranty period.

Final Warranty Acceptance (FWA). The date that defines the completion of the five-year warranty period. At the end of the warranty period, the contractor will be relieved of the responsibility to perform further work provided all warranty work has been completed. At which time, the warranty bond will be released by the Department.

Warranty Bond. A surety that guarantees that the warranty requirements are met.

Warranty Work. Corrective action taken to bring the warranted work into contract compliance for release of the warranty bond.

Quality Control Plan (QCP). A written plan that documents the Contractors material and construction control process. As a minimum the plan shall include each of the following:

1. A list of the quality control tests that will be used to control the material and construction quality.
2. The quality control sampling, testing, and documentation frequencies.
3. The bituminous pavement job mix formulas planned for the project.
4. A list of project materials and sources.
5. A description of bituminous mixture production and placement.

The sampling, materials, tests, and testing frequencies shall meet the requirements of Mn/DOT Specification 2350/2360 and the Mn/DOT Schedule of Materials Control. Except for the following:

- 1) When the bituminous mixture is uniform, the contractors testing may be reduced as follows: When the standard deviation of the last 4 test results for maximum specific gravity is less than 0.008 and the standard deviation of the last 4 test

results for bulk specific gravity is less than 0.010, contractor testing rates may be reduced up to 50%. (SAMPLING RATES SHALL NOT BE REDUCED)

- 2) When the bituminous mixture meets the uniformity criteria defined in 1) above, the production gradation testing rate may be reduced to one per day.
- 3) Mixture sampling may be performed from the truck box at the plant for 50% of the samples. Verification samples shall be taken from behind the paver.

Innovative sampling and testing methods and/or rates that do not meet current Mn/DOT requirements may be proposed in the QCP and will be approved or rejected at the discretion of the Mn/DOT Bituminous Engineer. The QCP must be approved by Mn/DOT prior to the start of warranted bituminous pavement construction. Approval of the QCP will be a joint action by Mn/DOT.

- A.3. Bituminous Pavement, Warranted.** This item consists of all bituminous pavement placed on driving lanes that has a total thickness of 4 inches or greater and is placed in two or more lifts, and all bituminous mixture placed on shoulders that has a total thickness of 3 inches or greater and is placed in two or more lifts.

B. Warranty Bond

Amount and Term. The Contractor must furnish a single-term warranty bond in the amount of 30% of the total bid amount for the warranted bituminous pavement. The warranty bond shall be furnished to the Department at the same time as the other Contract Bonds specified in Standard Specification (1305). The effective starting date of the warranty bond must be the date of FCA. The warranty bond will be released at the end of the warranty period (at FWA) or after all warranty work has been completed, whichever is latest.

- C. Dispute Resolution Team.** The Dispute Resolution Team will have the final authority to make decisions if a conflict occurs. The team will resolve disputes by a majority vote. The team will consist of one Contractor representative, one Department (District or Central Office) representative, and a third party mutually agreed upon by both the Department and the Contractor. The cost of the third party will be equally shared between the Department and Contractor. The team members will be called to action by the Mn/DOT Director of the Office of Materials and Road Research in accordance with the Mn/DOT Dispute Resolution Process on file in the Bituminous Unit. The team will use the Mn/DOT Distress Identification Manual, as necessary to resolve a dispute.

D. Pavement Distress Surveys, Evaluations, and Contractor Monitoring.

- D.1 Pavement Distress Surveys.** The Department will conduct a pavement distress survey (semi-automated or manual) of the warranted bituminous pavement during each year of the warranty period. The Department will conduct semi-automated distress surveys of the mainline pavement according to the normal frost free surveying cycle of the Department. The Department will provide advance notification of distress survey dates to the Contractor. The Department's semi-automated surveying cycle is dependent on the location of the highway and the highway classification. The Mn/DOT Distress Identification Manual will be used to determine and measure the different types of distress.

The pavement semi-automated distress surveys will be conducted by dividing the highway system into nominal one-mile sections. A 500 foot long segment in each mile, at the Mile Post sign, will be evaluated for pavement distress. If areas other than the surveyed segments are suspected of meeting or exceeding a threshold level, or significant distress occurs at any time, the Department will divide the entire mainline project pavement into 500 foot segments and conduct a distress survey (semi-automated or manual) in any, or all, segment(s). The distress survey results will be made available to the District, Central Office, and Contractor within 14 days after completion of the survey. Pavement distress threshold criterion are listed in Section J.

If any of the threshold level criterion are met and the contractor agrees to the validity of the pavement distress survey results, the Contractor shall correct the distress in accordance with the Time Requirements of Section G. Corrective actions shall be determined according to Section G. If any of the threshold level criterion are met and the contractor does not agree to the validity of the pavement distress survey results, written notification of the dispute will be made to the Engineer. If the Engineer and the Contractor can not resolve the dispute, the Dispute Resolution Team will resolve the dispute.

D.2. Contractor Monitoring. During the warranty period, the Contractor may monitor the pavement using nondestructive procedures. The Contractor will provide advance notification to the Department of all monitoring dates. Coring, milling or other destructive procedures may not be performed by the Contractor, without approval of the engineer.

E. Rights and Responsibilities of the Contractor.

The Contractor:

- (a) Must warrant to the Department that the warranted work will be free of defects in materials and workmanship as required by this specification.
- (b) Must obtain Department approval of a Quality Control Plan prior to the start of warranted bituminous pavement construction. (The QCP must be submitted to the Department 15 days prior to the start of warranted bituminous production).
- (c) Is responsible for performing all temporary or emergency repairs that are necessitated by noncompliance with the warranty requirements, using Department-approved materials and methods.
- (d) Must notify the Department and submit a written plan for performing the needed warranty work fourteen calendar days before starting warranty work, except in case of emergency repairs as detailed in this section. The submittal must propose a schedule for performing the warranty work and the materials and methods to be used.
- (e) Must follow a Department-approved traffic control plan (TCP) when performing, inspection, monitoring, emergency work or warranty work.
- (f) Must schedule warranty work during non-peak-hour traffic periods that are identical to those required for the bituminous overlay construction.
- (g) Is required to supply to the Department original documentation that all insurance required by the contract is in effect during the period that warranty work is being performed. This will include Railroad Protective Liability, when appropriate.
- (h) Must complete all warranty work prior to conclusion of the warranty period, or as otherwise agreed to by the Department.

- (i) Must be liable during the warranty period in the same manner as contractors currently are liable for their construction-related activities with the Department pursuant to the 2000 Edition *Standard Specifications for Construction*, including, but not limited to, sections 1708-Railroad-Highway Provisions, 1712-Protection and Restoration of Property and, 1714-Responsibility for Damage Claims. This liability must arise and continue only during the period when the Contractor is performing warranty work. This liability is in addition to the Contractor performing and/or paying for any required warranty work, and must include liability for injuries and/or damages and any expenses resulting therefrom that are not attributable to normal wear and tear of traffic and weather, but are due to noncompliant materials, faulty workmanship, and the operations of the Contractor.

F. Acceptance

Final Warranty Acceptance. The Department and the Contractor must jointly review all completed warranted work or a portion thereof, as determined by the Department. If the work does not meet the contract requirements, the Contractor must make all necessary corrections, at its own expense, prior to acceptance. Acceptance will occur as soon as the Department determines that the contract requirements have been met for the warranted work. The date on which acceptance occurs is termed the date of Final Warranty Acceptance (FWA).

Exclusion for Corrections. The Department may accept the work and begin the warranty period, excluding any area needing corrective work, to accommodate seasonal limitations or staged construction.

Disclaimer. Neither the FCA nor any prior inspection, acceptance, or approval by the Department diminishes the Contractor's responsibility under this warranty.

Documentation. Both FCA and FWA acceptance will be documented in writing and executed jointly by the Department and the Contractor. The Department will send a copy of the documentation to the Contractor's warranty bond surety agent upon completion of the warranty period.

Material. Acceptance of material in penalty under the Department's quality assurance program will not relieve the Contractor from meeting the material and workmanship warranty requirements for the accepted material.

G. Corrective Action Requirements

Criteria. Warranty work will be required when the following criteria are met as a result of defect in materials and/or workmanship. If fifty percent or more of the segments in any mile exceed the threshold limits for any condition parameter, the entire mile will require corrective action; otherwise, only the affected segments will require corrective action.

Threshold Limits. The specific threshold limits are shown in tables in Section J.

Nonwarranted Conditions. During the warranty period, the Contractor will not be held responsible for pavement distresses that are caused by factors unrelated to materials and workmanship. These include, but are not limited to, chemical and fuel spills, vehicle fires,

snowplowing and ice control, and destructive testing done by the Department during the warranty period. Other factors considered to be beyond the control of the Contractor that may contribute to pavement distress will be considered by the Department on a case-by-case basis upon receipt of a written request from the Contractor.

The warranty requirements will be waived if and when the accumulated number of Equivalent 18,000 pound Single Axle Loads (ESAL's) on the warranted pavement exceeds the Design 5 year accumulated ESAL's by 50% or more.

Time Requirements for Corrective Action. The Contractor will be responsible for taking corrective action within thirty calendar days after notice by the Department. If corrective action work cannot be started within thirty days of notification, due to seasonal limitations or scheduling, the Contractor must notify the Department in writing and determine a schedule for completion of the corrective action work. Failure by the contractor to respond to the Department or take corrective action within the specified period of time shall be cause for the Department to complete the corrective action work and recover the costs of such work from the warranty bond.

H. Emergency Repairs

If the Department determines that emergency repairs are necessary for public safety, the Department may perform or have performed repair action. The District Engineer, or his/her representative, will authorize emergency repairs. Prior to emergency repairs, the Department will document the basis for the emergency action, and will preserve evidence, such as photographs or videotapes, of the defective condition. Emergency repairs will be coordinated with the Contractor when possible. Emergency repairs that are warranty work (Contractor's responsibility) will be charged to the Contractor.

I. Flexible Pavement: Hot-Mix Bituminous Pavement

Application. This section is applicable to pavement warranties on hot-mix bituminous pavements. Distress identification must be according to the "Mn/DOT Distress Identification Manual" and the following definitions.

Limits of Warranted Work. The warranted work includes all bituminous pavement placed on driving lanes within the project limits, with a total thickness of 4 inches or greater and placed in two or more lifts and all bituminous mixture placed on shoulders within the project limits, with a total thickness of 3 inches or greater and placed in two or more lifts.

Warranty Term. The warranty term will be five years from the date of FCA.

Condition Parameters. Condition parameters are used to measure the performance of the bituminous overlay during the warranty term. Each condition parameter has a threshold level applied to each segment before corrective action (warranty work) is required. A condition survey (semi-automated or manual) will be done by the Department each year to determine compliance with the warranty provisions.

Definitions

Transverse Crack. A crack that is predominantly perpendicular to the pavement centerline.

Longitudinal Open Joint. A crack that is predominantly parallel to the pavement centerline. Includes centerline, traffic lane, and shoulder-traffic lane joints.

Multiple/Block Cracking. A pattern of cracks that divide the pavement into approximately rectangular pieces. Rectangular block sizes range from approximately 1 square foot (sq. ft.) to 100 sq. ft.

Longitudinal Cracking. Crack(s) predominantly parallel to the pavement centerline, but not at pavement joints.

Alligator/Fatigue Cracking. A series of interconnected cracks in the early stages of development, developing into many-sided, sharp-angled pieces, usually less than one foot on the longest side, with a characteristic chicken-wire or alligator pattern.

Debonding. A physical separation of the new pavement surface from the underlying pavement surface. Debonding will be visually identified as shoving, or the loss of new surface course. Surface potholes, regardless of depth, will be classified as debonding, to the extent that the condition was derived from the debonding of the new surface course.

Raveling. Wearing away of the hot-mix asphalt pavement surface caused by the dislodging of aggregate particles and loss of asphalt binder.

Flushing. Excess bituminous binder occurring on the pavement surface, which may cause a shiny, glass-like, reflective surface that may be tacky to the touch; usually found in the wheel paths.

Rutting. A longitudinal surface depression in the wheel path. It may have associated transverse displacement.

Popouts. Small pieces of pavement or aggregate broken loose from the surface greater than 3/8 inch in diameter.

- J. Threshold Limits.** The following table lists the allowable threshold limit for each condition parameter within each project segment. If any of the threshold limits is exceeded as a result of a defect in materials and/or workmanship, corrective action (warranty work) will be required. The defective segments for surface distress do not have to be contiguous to necessitate corrective action. Each driving lane and shoulder must be evaluated independently. Any pavement surface requiring removal or replacement to correct deficiencies for any condition parameter must be placed full-width across the driving lane or shoulder.

ALLOWABLE THRESHOLD LIMITS – HOT-MIX ASPHALT PAVEMENTS

Condition Parameter	500 ft. Segment Threshold Limits
Transverse Cracking - Low Severity - Medium Severity - High Severity	Three cracks per segment (minimum length = 6ft) Three cracks per segment (minimum length = 6ft) Two cracks per segment (minimum length = 6ft)
Longitudinal Joint - Low Severity - Medium Severity - High Severity	40% of the segment length. None Allowed None Allowed
Longitudinal Cracking	None allowed.
Multiple/Block Cracking	None allowed.
Alligator/Fatigue Cracking	None Allowed
Debonding & Potholes	None Allowed
Raveling	1% of the segment area.
Flushing (Single wheel path)	2% of the segment length.
Rutting	Rut depth of 0.375 inch or greater (25 Feet of the segment length)
Popouts	29 / Square Yard (Minimum 20 SY/segment)

- K. Corrective Actions.** The following corrective actions are suggested to illustrate acceptable treatments for the various condition parameters. The Contractor may use the Department-recommended corrective action where appropriate, or an alternative action, subject to Department approval. If 50 percent or more of segments in any mile exceed the threshold limits for any condition parameter, the entire mile will require corrective action; otherwise, only the segment exceeding the threshold limit will require corrective action.

**CORRECTIVE ACTIONS
HOT-MIX ASPHALT OVERLAYS**

Condition Parameter	Recommended Action
Transverse Cracking - Low Severity - Medium Severity - High Severity	Rout and Seal Rout and Seal/Mill and Resurface (2 ft. width) (1) Mill and Resurface (2 ft. width)
Longitudinal Joints - Low Severity - Medium Severity - High Severity	Crack Fill Rout and Seal. Mill and Resurface (2 ft. width)
Longitudinal Cracking	Crack Fill
Multiple/Block Cracking	Mill and Resurface. (150% of distressed area)
Alligator/Fatigue Cracking	Mill and Resurface. (150% of distressed area)
Debonding	Mill and Resurface. (150% of distressed area)
Raveling	Mill and Resurface/Microsurface (1)
Flushing	Mill and Resurface.
Popouts	Mill and Resurface.
Rutting	Mill and Resurface/Microsurface(2)

Footnotes: (1) Corrective action is dependent on the extent of the distress.
(2) Corrective action is dependent on the rut depth and in-place air voids.

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- L. Elective/Preventive Maintenance.** Elective/preventive maintenance will be a Contractor option. Elective/preventive maintenance to be performed and materials to be used will be coordinated jointly by the Contractor and the Engineer. All elective/preventive maintenance shall be incidental with no direct compensation or additional cost to the Department.
- M. Method of Measurement.** The warranted bituminous pavement bid items will be measured by the ton, based on the quantity of mixture placed, completed, and accepted. The Contractor will present records of shipment for the quantities placed under this special provision.
- N. Basis of Payment.** Bituminous Pavement, Warranted as measured above, will be paid for at the contract unit price. That price will be full compensation for furnishing, preparing, hauling, mixing and placing all materials, including asphaltic materials; for compacting mixtures; for preparation of foundation, unless otherwise provided; for the warranty bond(s), and warranty work, and required documentation; for traffic control; and for all labor, tools, equipment and incidentals necessary to complete the work.