city of Norton Shores

4814 Henry Street Norton Shores, Michigan 49441 www.nortonshores.org

AGENDA 11a&b
DATE 8-5-19

July 29, 2019

Council Meeting of August 5, 2019
Subject: Pavement Warranty Program

The Honorable Mayor
and
Members of the City Council

Ladies and Gentlemen:

As part of the Transportation Funding Package of 2015 a requirement was included that each local road agency adopt a Local Pavement Warranty Program acceptable to the Michigan Department of Transportation (MDOT) by September 18, 2019.

The warranty is required by local agencies using state or federal funds on all projects that include $2,000,000 or more in paving related components. Two resolutions are required to adopt the Pavement Warranty.

Adoption of the attached resolutions will authorize the development and implementation of a Local Pavement Warranty Program.

Respectfully submitted,

Mark C. Meyers
City Administrator

GAB/sr
Attachment

Norton Shores will not discriminate against any individual or group because of race, sex, religion, age, national origin, color, marital status, handicap or political beliefs or other legally protected characteristics.

RESOLUTION

WHEREAS, the Michigan Legislature (MCL 247.663) requires each city or village to adopt a Local Agency Pavement Warranty Program that was approved by the Michigan Department of Transportation in 2018, and

WHEREAS, the Michigan Local Agency Pavement Warranty Program was developed by the Local Agency Pavement Warranty Task Force for use by all 533 cities and villages in the format approved by the Michigan Department of Transportation in 2018, and

WHEREAS, the Michigan Department of Transportation has reviewed and approved the Michigan Local Agency Pavement Warranty Program consisting of Special Provisions (Boilerplate, Concrete, HMA, Location, Pass-Through Warranty Bond); a Warranty Bond Form and Contract Form; and Guidelines for Local Agency Pavement Warranty Programs, and

NOW, THEREFORE, BE IT RESOLVED, the City of Norton Shores hereby adopts the Michigan Local Agency Pavement Warranty Program and accompanying documents in accordance to the requirements of MCL 247.663.

At a rescheduled meeting of the City Council of the City of Norton Shores, held at the Norton Shores Branch Library, 705 Seminole Road, on the 5th day of August 2019, the foregoing resolution was moved for adoption by Council Member. The motion was supported by Council Member.

Ayes:

Nays:

Resolution declared adopted/denied

_____

Shelly Stibitz, City Clerk

RESOLUTION

WHEREAS, the Michigan Legislature created a requirement (MCL 247.663) as part of the Transportation Funding Package of 2015 that requires each city and village to adopt a Local Agency Pavement Warranty Program that was approved by the Michigan Department of Transportation in 2018, and

WHEREAS, the City of Norton Shores adopted the Michigan Local Agency Pavement Warranty Program on August 5, 2019, and

WHEREAS, the City of Norton Shores agrees to consider a local pavement warranty on each project that includes $2,000,000 or more in paving-related items and includes any state or federal funds, and

WHEREAS, the Local Agency Pavement Warranty Program law requires each city and village to report annually on each project that includes $2,000,000 or more in paving-related items and includes any state or federal funds, whether or not a warranty was utilized in the project, and

WHEREAS, the City of Norton Shores agrees to implement the Michigan Local Agency Pavement Warranty Program consistent with the Guidelines for Local Agency Pavement Warranty Program document that was approved by the Michigan Department of Transportation in 2018; and which City of Norton Shores' adopted Implementation Policy defines the City of Norton Shores' intent of its pavement warranty program,

NOW, THEREFORE, BE IT RESOLVED, the City of Norton Shores hereby agrees to implement the Local Agency Pavement Warranty Program and annually report in accordance with the law.

At a rescheduled meeting of the City Council of the City of Norton Shores, held at the Norton Shores Branch Library, 705 Seminole Road, on the 5th day of August 2019, the foregoing resolution was moved for adoption by Council Member. The motion was supported by Council Member.

Ayes:

Nays:

Resolution declared adopted/denied

_____

Shelly Stibitz, City Clerk

city of Norton Shores

Internal Memo

July 26, 2019

TO: Mark Meyers, City Administrator

FROM: Gerald Bartoszek, Public Works Director GAB

SUBJECT: Pavement Warranty Program

As part of the Transportation Funding Package of 2015 a requirement was included that each local road agency in Michigan adopt a Local Pavement Warranty Program acceptable to the Michigan Department of Transportation (MDOT) by September 18, 2019. A warranty must be considered by the local agencies using state or federal funds on all projects that include $2,000,000 or more in paving related components.

A Local Agency Pavement Warranty Task Force was formed to develop a program meeting the requirements of the law. Two resolutions are required to adopt the Pavement Warranty. One resolution adopts the warranty program and the second resolution addresses the implementation of the program.

While we don't have any projects using state or federal funds of $2,000,000 or more in paving related components and are very unlikely to have any in this range in the near future, we are required to adopt a warranty program. Therefore, it is my recommendation to adopt the warranty program as prepared by the task force.

I request that this item be included on the August 5, 2019 City Council agenda.

GUIDELINES FOR LOCAL AGENCY PAVEMENT WARRANTY PROGRAM

By
CRA Engineering Committee
Local Agency Pavement Warranty Task Force

Revised 8-13-2018

PREFACE- Intent of the Local Agency Warranty Program

The Legislature (P.A. 175 of 2015) requires each local road agency to adopt a Local Pavement Warranty Program acceptable to the Michigan Department of Transportation. Warranties have the potential to improve the quality of road projects, benefitting the drivers, taxpayers and road agencies of Michigan

The intent of the Local Agency Pavement Warranty Program is to provide a warranty program that all local agencies can use for all hot mix asphalt and plain jointed concrete paving projects on public roads and streets. This pavement warranty program was created by the Local Agency Pavement Warranty Task Force, to establish a common pavement warranty program for all local agencies in Michigan. The goals of this Local Agency Pavement Warranty program is to standardize the review, to provide oversight of pavement warranty projects, and to make this program more transparent and uniform for private sector contractors.

This Local Agency Pavement Warranty Program is available for all local road agencies if they choose to use it. Local road agencies vary dramatically in size and sophistication; therefore the Local Road Warranty Task Force developed a warranty program to address the capabilities of the rural, the mid-sized urban and the large urban agencies. This approach provides a warranty program that meets the intent of Public Act 175 of 2015 (MCL 247.662 and 247.663), and provides all local road agencies with a pavement warranty program that provides value to the public.

The Local Road Warranty Task Force recognizes there may be substantial benefits and public confidence resulting from a comprehensive pavement warranty program. However, the existing pavement structure, drainage and planned improvements for each project will need to be evaluated on an individual basis to critically assess a justification or basis for a pavement warranty. Road agencies should anticipate increased project costs related to higher bid prices and costs for the warranty administration such as: pavement monitoring, defect documentation, official notifications, joint field inspections; defect remediation and dispute resolution.

The intent of this GUIDELINES FOR LOCAL AGENCY PAVEMENT WARRANTY PROGRAM, is to provide an overview and guidance on implementing a pavement warranty project. This guideline is intended for local agency use and it not intended to be a contract document.

be subjected to a significant amount of overloads (higher than average daily truck counts and/ or heavier than normal axle loading) during the anticipated warranty term, the road may not be a good candidate for pavement warranties. Therefore, the Local Agency Pavement Warranty Program is recommended for road segments designated as "all-season road" which are designed for year-round normal loading.

While the law indicates where possible a pavement warranty shall be secure when the paving project exceeds $2 million, the Task Force recognizes project bids are often 10 percent over the engineer's opinion of cost, and that a warranty requirement cannot be retroactively applied to a road project after the bids are opened. Thus, the Task Force has recommended the more conservative $1.8 million engineer's opinion of cost for pavement related items, as the point when the local agency decides if the warranty special provisions are included in the bid documents, rather than the $2 million stated in the law.

The Task Force believes the Michigan Legislature was speaking in the context of new Michigan Transportation Funds for roads, which are exclusively state revenue sources, when it included the Local Agency Pavement Warranty Program alongside the new funding legislation in the 2015 Transportation Package. It also seems clear the Legislature was speaking not just to the new transportation funds, but also to the other road funds under its control, which includes the federal fund**s** flowing through MDOT to the local road agencies.

The Local Agency Pavement Warranty Program also recognizes that if the only source of revenue for a local road agency paving or reconstruction projects is entirely locally derived revenue (non- Act 51 or Federal Funds) such as local general fund, millage revenue, special assessment districts or other locally raised revenue; then these projects will not be subject to the Local Agency Pavement Warranty Program reporting requirements.

It's important to note that this Local Agency Pavement Warranty Program may also be used by that local road agency on any paving project regardless if the $2 million dollar threshold for pavement related items has been reached or not. This approach ensures that Local Pavement Warranties can be used on any project with any funding source, including Michigan Transportation Funds, and can utilize the same requirements to provide greater understanding and transparency to contractors, stakeholders and the public.

Warranty Contract Process

For those construction projects advertised and let through the MDOT Local Agency Programs, the construction contract is between the prime contractor and MDOT. The prime contractors' surety company names MDOT as the obligee in the performance bond in the original contract. For Local Agency Pavement Warranty projects, an additional warranty contract and pavement warranty bond will be required prior to award, see Appendix D. The bid proposal shall include a contract consistent with the model contract and bond form shown in Appendix D. These documents will serve as the contract and warranty bond between the local road agency and the paving contractor for the warranty work. The warranty bond will be provided by the paving contractor in the name of the local road agency.

The MDOT Local Agency Agreement will reference the local road agency's responsibility to administer the warranty portion of the contract. Upon the acceptance of the construction work, the prime contractor's contract and performance bond with MDOT will be released and no longer in effect. At this point the warranty contract and warranty bond are triggered to begin the new contract for the warranted work during the warranty term.

Warranty Documents

The Local Agency Pavement Warranty consists of the warranty contract and warranty bond as well as the appropriate special provisions:

- Local Road Agency Special Provision for Hot Mix Asphalt and Concrete Pavement Warranty
- Local Road Agency Special Provision for Warranty Work Requirements for Hot Mix Asphalt Pavement
- Local Road Agency Special Provision for Warranty Work Requirements for Jointed Plain Concrete Pavement
- Local Road Agency Special Provision for Pavement Warranty Information

The Local Road Agency Special Provision for Hot Mix Asphalt and Concrete Pavement Warranty establishes the common terms and definitions applied to pavement projects requiring a warranty. The Local Road Agency Special Provision for Warranty Work Requirements for Hot Mix Asphalt Pavements warrants the Local Road Agency against specific defects in HMA pavements. The Local Road Agency Special Provision for Warranty Work Requirements for Jointed Plain Concrete Pavement warrants the Local Road Agency against specific defects in concrete pavements. Local Road Agency Special Provision for Pavement Warranty Information provides the beginning and ending locations for warranted work and the applicable warranty work requirements special provision.

Under the Local Agency Pavement Warranty special provisions the Prime Contractor is responsible for correcting defects in the pavement caused by elements within the contractor's control (i.e., the materials supplied, the workmanship, etc.), during the warranty period. The Pavement Warranty Contract Provisions and Warranty Bond may pass through to subcontractors, and with this the responsibility to correct warranty defects, at the direction of the Prime Contractor and upon written notice to the agency prior to the start of the work.

The contractor assumes no responsibility for defects that are design related unless the paving contract is design-build. When a defect is attributable to the materials and/or workmanship and/or the design, the responsibility for correcting the defect (or defects) will be shared by the agency and the contractor. The contractor is responsible for the percentage of fault attributable to the workmanship and/or materials, and the agency is responsible for the percentage of fault attributable to the design. Note: The agency may elect to require the contractor to provide the pavement design(s) in the contract documents and specifications. In this case, the Contractor shall also be responsible for the percentage of fault attributable to the pavement design.

Warranty Process

The process flow charts as shown in Appendix A describe the steps involved in the warranty administration process. The warranty term begins with the acceptance of the warranted work during construction of the project. Warranty Administration involves periodic condition inspections of the mainline pavement areas throughout the warranty term; joint field inspections; documentation of findings, official notifications; joint determination of defects; initiation of corrective action, inspection & documentation of the corrective action taken, filing those inspection reports as necessary, and if necessary a conflict resolution process. If at any time, a safety issue or significant defect is observed or reported, prior to a scheduled inspection, an interim inspection will be initiated by the agency. If emergency repairs are determined to be necessary the agency can perform these repairs without altering the contractor's responsibilities under the warranty contract.

Supplemental Lien Bonds and Liability Insurance

In addition to the warranty bond that is in place, if corrective work is necessary the contractor must furnish supplemental lien bond to the local agency covering the corrective work. The Engineer is responsible for estimating the amount of the supplemental lien bond required. The amount should be approximately equal to the dollar amount of the corrective work. The contractor must also have liability insurance in place prior to performing corrective work during the warranty period. The contractor should not be allowed on-site to perform corrective work during the warranty period until the supplemental lien bond is in place and the proper insurances verified. Depending on the nature and scope of the corrective work, the local agency may waive this supplemental lien bond, but not the liability insurance.

Warranty Inspections

Warranty inspections are limited to only mainline pavement areas. There are two types of inspections conducted during the warranty period. The cursory inspection is a simplified inspection to quickly identify segments in the project that may have distresses that exceed threshold values. This cursory inspection normally does not require a lane closure and is conducted from the roadway shoulder estimating distress lengths and widths. The detailed inspection requires direct measuring and reporting of all observed distress in each segment. Traffic control may be required to complete the detailed inspection.

The minimum inspection frequency for the various warranty provisions are specified in the applicable warranty inspection guidelines, see Appendix B. The minimum number of inspections is dependent upon the warranty duration. The local road agency may elect to perform additional inspections over & above the recommended minimum interim inspections. The suggested time frames in the inspection guidelines allow local road agencies to notify the contractor regarding warranty compliance. Interim inspections may be delayed if weather makes it difficult to inspect the road or creates an unsafe condition. Final inspections shall be completed in a timely manner to ensure that there is enough time to document any thresholds that exceed the condition thresholds and notify the contractor prior to the expiration of the warranty.

The designation of lanes during the warranty inspection shall be detailed adequately so that it is clear to all involved in the warranty process which lane is being referenced. If necessary, a sketch should be included. It is important to use the same lane numbering designation for all inspections conducted throughout the warranty period.

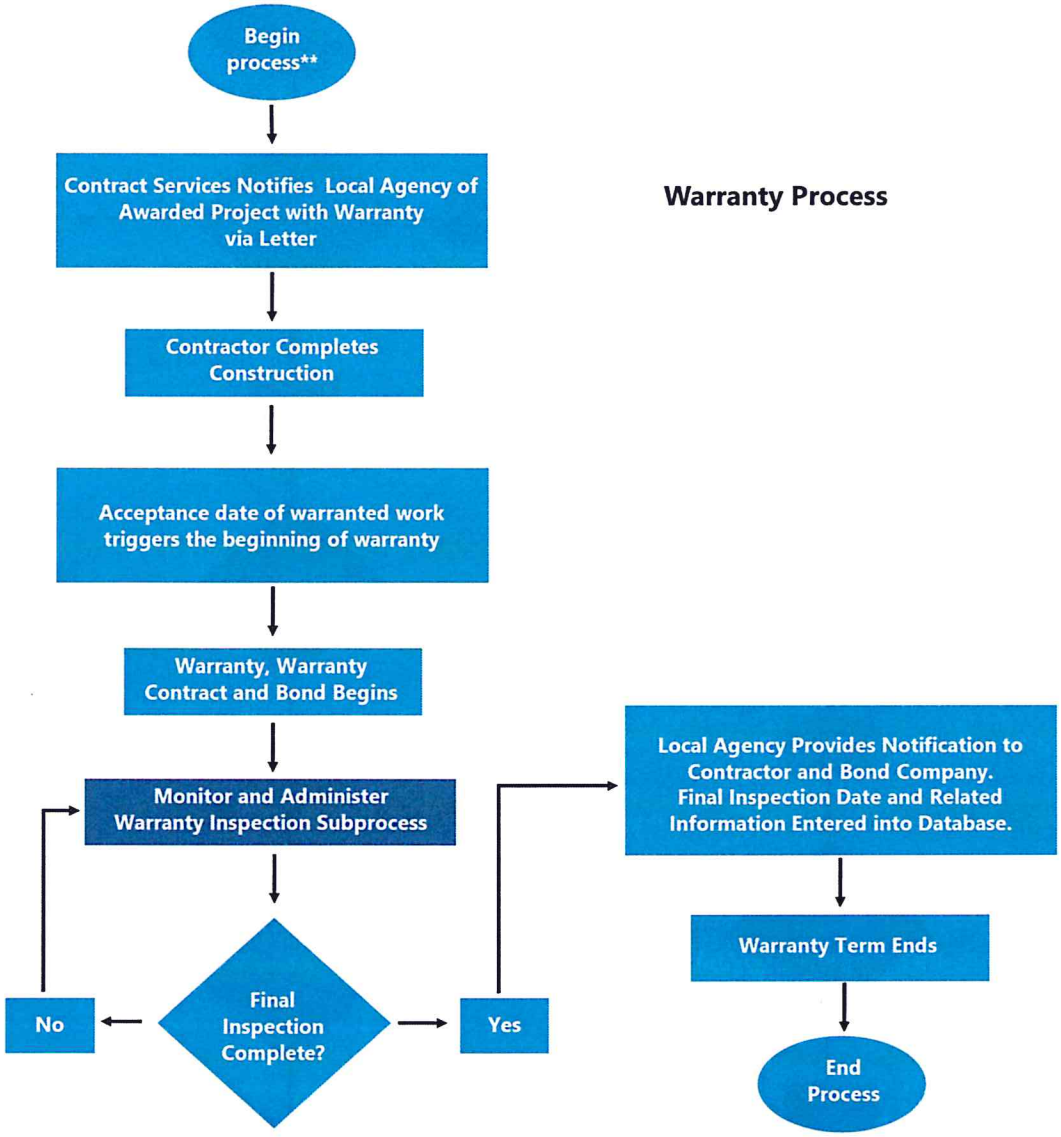
If defects are found in any inspection, they should be carefully and accurately documented, even if the severity or number does not meet the threshold to require corrective work. These notes shall be kept in the inspection files and reviewed prior to all future inspections of the work. The inspectors of the work should pay specific attention to areas previously noted, record those defects, and list any changes in those defects differing from the last inspection.

Correction of Defects

If inspections during the warranty term show a defect has exceeded the allowable threshold as defined in either the Hot Mixed Asphalt or Concrete Warranty specification, the contractor shall be notified of the finding. The agency should call for a joint field investigation to determine the cause of the defect, and to discuss the best possible remediation of the problem. If additional forensic investigation is desired, the scope of the investigation, party or consultant to conduct

APPENDIX A

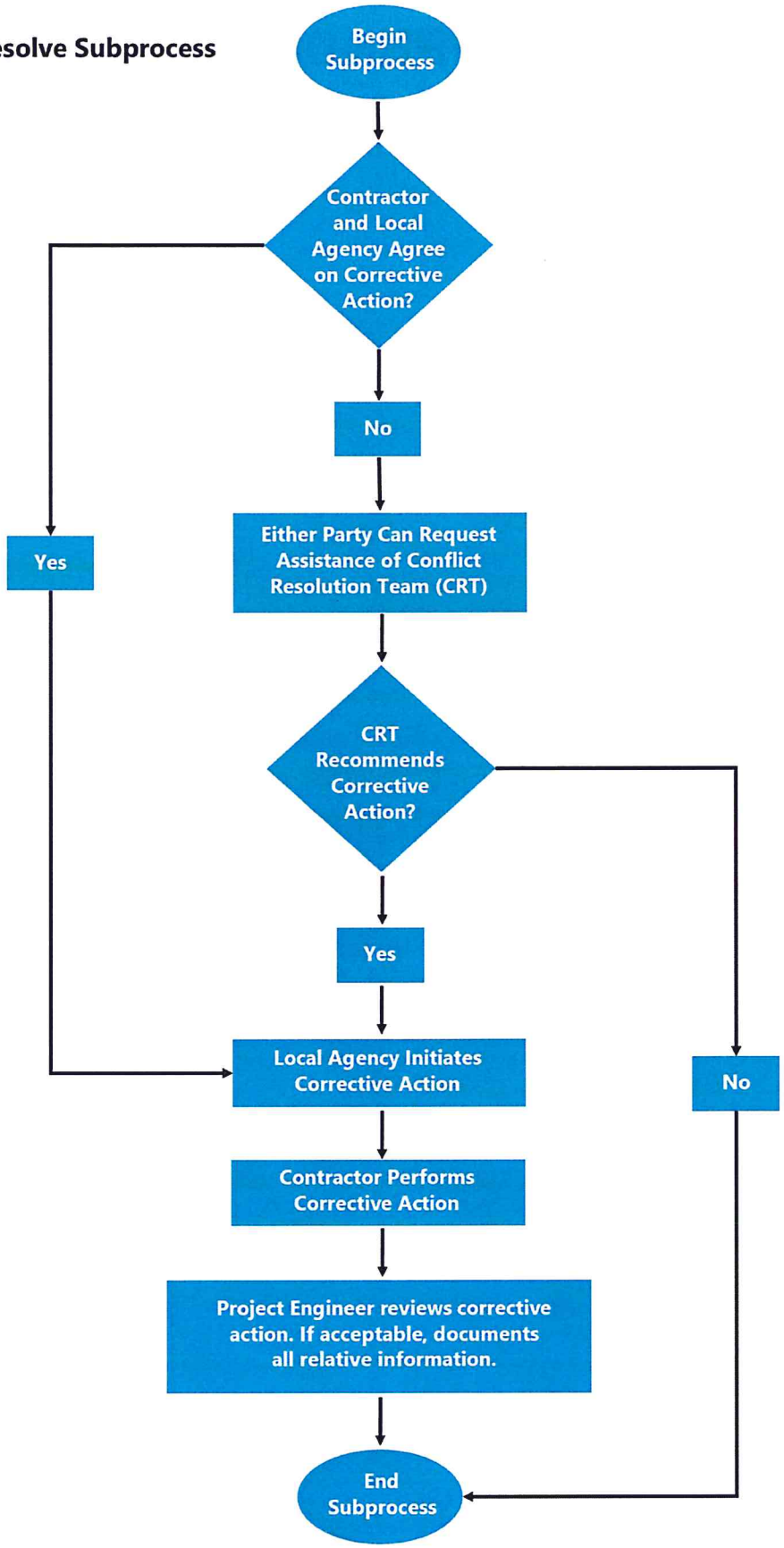
Flow Charts



Warranty Process

**This is the process if MDOT has oversight and/or MDOT let bid.
If project is locally let, with no MDOT oversight, the local agency shall determine the process.

Resolve Subprocess



LOCAL AGENCY
WARRANTY INSPECTION GUIDELINES
HMA NEW CONSTRUCTION / RECONSTRUCTION

Warranty period: 5 Year

Inspection Period Begins: Interim - 6 months after Initial Acceptance
Final - 56 months after initial Acceptance
(Local Agency may do additional inspections)

Notes:

1. Segments defined as 528 foot (1/10 mile).
2. Each lane will be evaluated separately.
3. The threshold level for each distress type is determined separately.

Procedure:

For both **INTERIM** & **FINAL** inspections

1. **Perform overview inspection**. Based on results of overview inspection, recommend the project for either:
   a. Acceptable – no corrective work needed. If this is the final inspection recommend acceptance of the work, or
   b. Detailed inspection – more detailed inspection and / or measurements are needed

2. **Perform detailed inspection if required**. Based on the results of detailed inspection, either:
   a. Acceptable – no corrective work needed. If this is the final inspection recommend acceptance of the work, or
   b. Warranty work is needed – Provide contactor written notice of the distresses and locations needing corrective work.

Condition Parameter Measurement:

Performance parameters will be measured as described for each of the following distress types in mainline pavement areas:

1. **Transverse Cracking** - Total number of transverse cracks in a segment. Each individual crack must exceed 5 feet in length to be included in the total.
2. **Longitudinal Cracking** - Total linear feet of longitudinal cracks in a segment. Each individual crack must exceed 5 feet in length to be included in the total.
3. **De-bonding**- Total longitudinal length, in feet, of de-bonding in a segment. Potholes are to be classified as de-bonding. Measure individual de-bonding locations in the longitudinal direction, regardless of width of the distress location and sum these lengths for the segment.
4. **Raveling -** Total longitudinal length, in feet, of raveling in a segment. Measure individual raveling locations in the longitudinal direction, regardless of width of the distress location and sum these lengths for the segment.
5. **Flushing** - Total longitudinal length, in feet, of flushing in a segment. Measure individual flushing locations in the longitudinal direction, regardless of width of the distress location and sum these lengths for the segment.
6. **Rutting** - The average rut depth, in inches, in a segment. Each wheel path shall be evaluated separately. If rutting is found, the pavement surface will be measured beginning at the POB and every 132 feet thereafter to determine average rut depth to quantify rutting for a

b. Provide a description of the magnitude and location(s) of the distress condition(s) observed which justify the Detailed Inspection.

5. If **all** conditions above are false:
   a. Recommend work is acceptable.
   b. If this is an interim or other non-final inspection, put notes in file.
   c. If this is final inspection recommend final acceptance.

Detailed Inspection Procedure:

1. Determine the questionable segments suspected of exceeding threshold limits for each individual distress type based on the overview inspection notes.

2. Document the lane, direction and distance from POB, of each questionable segment identified in Step 1.

3. For each questionable segment, measure and record the amount of each individual distress type and record on the inspection form.
   a. Transverse Cracking
   b. Longitudinal Cracking
   c. De-bonding
   d. Raveling
   e. Flushing
   f. Rutting
   g. Alligator Cracking

4. Determine if any of the threshold limits for transverse cracking, longitudinal cracking, de-bonding, raveling, flushing, or alligator cracking, listed under Overview Inspection, are exceeded.

5. Evaluate segments where the average rut depth appears to exceed 0.25 inches as follows.
   a. Measure the average rutting at all questionable segments to verify that the threshold was exceeded.

6. Warranty work is required at those segments for which any of the threshold limits for transverse cracking, longitudinal cracking, de-bonding, raveling, flushing, rutting, or alligator cracking are exceeded. Provide the contractor with results of the inspection indicating segments where warranty work is required.

thereafter to determine average rut depth to quantify rutting for a particular segment. Rut measurements will be done using a straight rigid device that is a minimum of 7 feet long and of sufficient stiffness that it will not deflect from its own weight, or a wire under sufficient tension to prevent sag when extended 7 feet. Measurements will be taken by placing this "straightedge" across the pavement surface perpendicular to the direction of travel. The straightedge shall contact the surface on at least two bearing points with one located on either side of the rut. The straightedge is properly located when sliding the straightedge along its axis does not change the location of the contact points. Rut depth is then measured at the point of greatest perpendicular distance from the bottom of the straightedge to the pavement surface.

7. **Alligator Cracking** – Total area, in square feet, of alligator cracking in a segment. Measure individual alligator cracked areas and sum the areas for the segment.

Overview Inspection Procedure:

1. Review any notes from previous inspections.

2. Perform a "windshield" survey of the entire location length. Based solely on visual examination and estimated measurements, approximate the individual distress quantities for questionable segment(s) of each distress type and record on the inspection form. Details which should be noted for the inspection include, but are not limited the following:
    a. The lane or ramp where the distress was noted and the associated direction.
    b. Approximate distress location (i.e. 1/4 mile north of the POB, or at the intersection of 1st St in SW quadrant, or near drive for house #123..)
    c. The distress quantity, in general terms (i.e. minor amounts of longitudinal cracking; mid lane flushing).
    d. Areas where temporary maintenance makes it difficult to determine the type of distress, (i.e. presence of cold patching material).

3. Estimate if any of the following distress threshold conditions are exceeded
    a. Transverse Cracking exceeds 3 total in the segment length (3 cracks within 528 feet) for any 2 segments. All reflective cracking shall be ignored as these will not count against the allowable amount.
    b. Longitudinal Cracking exceeds 25 percent of the segment length (132 feet within 528 feet) for any 2 segments. All reflective cracking shall be ignored as these will not count against the allowable amount.
    c. Debonding exceeds 5 percent (5%) of the segment length (26 feet within 528 longitudinal feet) for any 1 segment..
    d. Raveling exceeds 8 percent (8%) of the segment length (42 feet within 528 longitudinal feet) for any 1 segment.
    e. Flushing exceeds 5 percent (5%) of the segment length (26 feet within 528 longitudinal feet) for any 1 segment.
    f. Average rut depth exceeds 0.375 (3/8) inches for any 1 segment.

LOCAL AGENCY
WARRANTY INSPECTION GUIDELINES
HMA OVERLAY

Warranty period: 1 Year

Inspection Period Begins: Final - 10 months after Initial Acceptance
(Local Agency may do additional inspections such as at 6 months after initial acceptance, after spring break up, etc.)

Notes:

1. Segments defined as 528 foot (1/10 mile).
2. Each lane will be evaluated separately.
3. The threshold level for each distress type is determined separately.

Procedure:

1. Preform **overview inspection**. Based on results of cursory inspection, recommend the project for either:
   a. Acceptable – no corrective work needed. If this is the final inspection recommend acceptance of the work, or
   b. Detailed inspection – more detailed inspection and / or measurements are needed

2. **Perform detailed inspection if required**. Based on the results of detailed inspection, either:
   a. Acceptable – no corrective work needed. If this is the final inspection recommend acceptance of the work, or
   b. Warranty work is needed – Provide contactor written notice of the distresses and locations needing corrective work.

Condition Parameter Measurement:

Performance parameters will be measured as described for each of the following distress types in mainline pavement areas:

1. **Transverse Cracking** - Total number of transverse cracks in a segment. Only count cracks that are not "reflective" from a prior crack or joint. Count all transverse cracks that cannot be positively identified as "reflective" or are questionable. Each individual crack must exceed 5 feet in length to be included in the total. Ignore transverse cracking for all single course overlays, or if the total thickness of multiple course overlays is 2" or less.
2. **Longitudinal Cracking** - Total linear feet of longitudinal cracks in a segment. Only count cracks that are ***not*** "reflective" from a prior crack or joint. Count all longitudinal cracks that cannot be positively identified as "reflective" or are questionable. Each individual crack must exceed 5 feet in length to be included in the total. Ignore transverse cracking for all single course overlays, or if the total thickness of multiple course overlays is 2" or less.
3. **De-bonding**- Total longitudinal length, in feet, of de-bonding in a segment. Potholes are to be classified as de-bonding. Measure individual de-bonding locations in the longitudinal direction, regardless of width of the distress location and sum these lengths for the segment.
4. **Raveling -** Total longitudinal length, in feet, of raveling in a segment. Measure individual raveling locations in the longitudinal direction, regardless of width of the distress location and sum these lengths for the segment.

c. Debonding exceeds 5 percent (5%) of the segment length (26 feet within 528 longitudinal feet) for any 1 segment.
d. Raveling exceeds 8 percent (8%) of the segment length (42 feet within 528 longitudinal feet) for any 1 segment.
e. Flushing exceeds 5 percent (5%) of the segment length (26 feet within 528 longitudinal feet) for any 1 segment.
f. Average rut depth exceeds 0.375 (3/8) inches for any 1 segment.
g. Any amount of alligator cracking.

4. If **any** condition above (in item 2) is estimated to be true:
   a. Perform Detailed Inspection; and
   b. Provide a description of the magnitude and location(s) of the distress condition(s) observed which justify the Detailed Inspection.

5. If **all** conditions above are false,
   a. Recommend work is acceptable.
   b. If this is an interim or other non-final inspection, put notes in file
   c. If this is final inspection recommend final acceptance.

Detailed Inspection Procedure:

1. Determine the questionable segments suspected of exceeding threshold limits for each individual distress type based on the overview inspection notes.

2. Document the lane, direction and distance from POB, of each questionable segment identified in Step 1.

3. For each questionable segment, measure and record the amount of each individual distress type and record on the inspection form.
   a. Transverse Cracking
   b. Longitudinal Cracking
   c. De-bonding
   d. Raveling
   e. Flushing
   f. Rutting
   g. Alligator Cracking

4. Determine if any of the threshold limits for transverse cracking, longitudinal cracking, de-bonding, raveling, flushing, or alligator cracking, listed under Overview Inspection, are exceeded.
5. Evaluate segments where the average rut depth appears to exceed 0.25 inches as follows.
   a. Measure the average rutting at all questionable segments to verify that the threshold was exceeded.

6. Warranty work is required at those segments for which any of the threshold limits for transverse cracking, longitudinal cracking, de-bonding, raveling, flushing, rutting, or alligator cracking are exceeded. Provide the contractor with results of the inspection indicating segments where warranty work is required.

Overview Inspection Procedure:

1. Review any notes from previous inspections of the work.

2. Perform a "windshield" survey of the entire project length. Inspect all driving lanes. Based solely on visual examination and estimated measurements, approximate the individual distress quantities for the questionable segment(s) of each distress type and record on the inspection form. Details which should be noted for the inspection include, but are not limited the following:
   a. The lane or ramp where the distress was noted and the associated direction.
   b. Approximate distress location (i.e. 1/4 mile north of the POB, or at the intersection of 1st St in SW quadrant, or near drive for house #123..)
   c. Estimate the distress quantity. Also include a description of distress in general terms (i.e. minor amounts of longitudinal cracking; every joint has loss of sealant).
   d. Areas where temporary maintenance makes it difficult to determine the type of distress, (i.e. presence of cold patching material).

3. If this is an **interim** or other non-final inspection, Put notes in file and STOP HERE.

4. If this is the final inspection, estimate if any of the following distress threshold conditions are exceeded
   a. Transverse Cracking exceeds 2 total for any 1 segment. (2 cracks within 528 feet).
   b. Longitudinal Cracking exceeds 5 percent (5%) of the segment length (26 feet within 528 feet) for any 1 segment.
   c. Map Cracking exceeds 10 percent (10%) of the segment area (632 square feet within 528 longitudinal feet assuming 12 foot lane width) for any 1 segment.
   d. Spalling exceeds 10 percent (10%) of each slab. Can be non-contiguous. Include all 4 sides of the slab.
   e. Scaling exceeds 15 percent (15%) of the slab area.
   f. Corner cracking exceeds 1 for any 1 segment.
   g. Joint Sealant failure exceeds 10 percent (10%) total joint length in a segment. Include both longitudinal & transverse joints
   h. Any shattered slabs.

5. If any condition above is true:
   a. Perform Detailed Inspection; and
   b. Provide a description of the magnitude and location(s) of the distress condition(s) observed which justify the Detailed Inspection.

6. If all conditions above are false and this is the final inspection, recommend Final Acceptance.

Detailed Inspection Procedure: This will be done at **FINAL** inspection when distresses are estimated to be at threshold levels, and at **INTERIM** inspections as directed by the engineer.

1. Determine the questionable segments suspected of exceeding threshold limits for each individual distress type based on the overview inspection notes.

APPENDIX C

Inspection Forms

Under Development

The inspections forms have not been developed to-date; the Task Force Education Committee is working with LTAP to create inspection forms compatible with the RoadSoft program to enable tracking the warranty inspection forms to the actual location along a road segment

INSPECTION FORM FOR CONCRETE WARRRANTY WORK

Inspected By: _____ Date: _____

Type of inspetion: ___ Interim ___ Final ___ Special

Type of Construction: ___ Plain Concrete
___ Reinforced Concrete

Condition Parameter or Defect	Threshold Limits Per Segment (Length = 528 feet)	Max. Defective Segments Per Driving Lane-Mile (a)
Transverse Crack	2	1
Longitudinal Crack	5% of segment length	1
Map Cracking	10% of segment area	1
Edge Spalling	10% each slab (b) < 2 slabs	1
Surface Scaling	15% of the slab area < 1 slab	1
Corner Cracking	1	1
Joint Sealant Failure	10% joint length (c) < 2 slabs	1
Shattered Slab	0 (d)	0

Distresses Found? ____Yes (Describe below, attach additonal sheets if needed) ____No

Distresses Found: (Describe type, severity & location)

Corrective action needed? _____ Yes _____ No _____ Needs further evaluation

Signed (INSPECTOR): _____

Checked by (ENGINEER): _____

MICHIGAN
LOCAL AGENCY
SPECIAL PROVISION
FOR
PASS-THROUGH WARRANTY BONDS

LM 1 of 1 9/5/2017

a. Description. This special provision establishes the conditions under which and method for a contractor to assign responsibility for the warranty obligations and the providing of a warranty bond to a warranty contractor(s). Second tier subcontractor assignments are prohibited.

b. Requirements. Ensure the Warranty Contract(s) and warranty bond(s) are on forms provided by the Local Agency. Ensure the bonds meet the requirements of Michigan law and of the Local Agency and include other items such as the powers of Attorney and Endorsement as specified by the Local Agency.

c. Method. The assignment must be made to the warranty contractor(s) that will perform the work covered by the warranty. If for any reason after signing the Warranty Contract and providing the Warranty Bond, the warranty contractor does not perform the work, the warranty contractor will remain obligated for the warranty obligations and the warranty bond obligations will remain in effect unless the Local Agency consents in writing to substituting a different contractor to assume those warranty obligations and accepts a substitute warranty bond.

The assignment of warranty work must be designated with and at the time of electronic bid submittal. To become a warranty contractor responsible for the warranty obligations of the contract, and providing a warranty bond, the warranty contractor must complete and submit to the Local Agency a Warranty Contract and a Warranty Bond for each warranty it will be responsible for. Ensure the Warranty Contract is signed by an authorized signer of the warranty contractor, as identified in its prequalification application.

Submit the Warranty Contract and Warranty Bond to the Local Agency prior to award of the construction contract to the prime contractor for the work to which the warranty applies. Ensure the warranty contractor is prequalified in the work classification for the type of work to be warranted. The Warranty Bond must guarantee performance of all warranty obligations for the covered work, in accordance with the Warranty Contract. All provisions of the prime contract will be applicable to the warranty contractor in regard to the warranty work, except as otherwise expressly provided in the Warranty Contract.

Under no circumstances does the assignment of the warranty work and the execution of a Warranty Contract create any obligations to the Local Agency beyond the obligations undertaken in the prime contract. The purpose of the Local Agency accepting the assignment of warranty obligations is to allow a warranty contractor to stand in place of the prime contractor for purposes of the warranty work without increasing any obligation or liability that the Local Agency would have had if the prime contractor had not assigned the warranty work.

d. Measurement and Payment. This work will not be paid for separately, but will be included in costs for other pay items.

PASS THROUGH WARRANTY CONTRACT

This contract ID number_____is executed on the date signed below by the_____ of the <local agency name> between the Warranty Contractor, Prime Contractor and the Local Agency in conjunction with the execution of this contract ID number, between the Local Agency and the Prime Contractor.

(Warranty Contractor)

(Prime Contractor)

The work included within this Warranty Contract is, described here:

The Warranty Contractor represents that it has entered into a subcontract with the Prime Contractor to perform Warranted Work for the project, but that any failure to have properly done so, or any breach or failure in the performance of that subcontract, shall not diminish or otherwise affect the obligations of the Warranty Contractor to the Local Agency under this warranty contract. Nor shall the obligations of the Warranty Contractor to the Local Agency under this warranty contract be diminished or affected if the Prime Contractor or some other person performs some or all of the Warranted Work or warranty obligations for the project, unless the Local Agency consents to, and executes, a written amendment to this warranty contract.

Insofar as they pertain to the warranty rights and obligations, the terms of the contract are hereby incorporated by reference into this warranty contract and, for purposes of this warranty contract, references in the contract to the contractor shall be deemed to refer to the Warranty Contractor.

The Warranty Contractor hereby agrees to fulfill and perform, without qualification or exception, all of the warranty obligations under the terms of the contract, as if they were the Prime Contractor. Until acceptance of the Warranted Work, the Prime Contractor will be responsible to the Department for ensuring completion of the Warranted Work and to the Local Agency for fulfilling the terms of the warranty for that work. Upon acceptance of the Warranted Work, the Warranty Contractor shall have full responsibility for the warranty obligations and the Prime Contractor will be relieved of further obligation for performing those warranty obligations.

The Warranty Contractor agrees that its obligations to the Local Agency under this warranty contract are the same as if the Warranty Contractor was the Prime Contractor; the Warranty Contractor can assert no rights, defenses or qualifications to the warranty obligations under the contract that would have been unavailable to the Prime Contractor, if the Prime Contractor had retained contractual responsibility for the warranty. The Warranty Contractor may assert the same rights under the terms of the warranty as could have been asserted by the Prime Contractor, if the Prime Contractor had retained contractual responsibility for the warranty.

This warranty contract may be executed prior to execution of the contract with the Prime Contractor, provided that if the Local Agency fails to execute the contract with the Prime Contractor this warranty contract shall be null and void.

By: _____

Title: _____

By: _____

Typed name: _____

Local Agency: _____

Date: _____

By: _____

Title: _____

APPENDIX F

Education and Training

Under Development

Education of Local Road Agencies on Local Pavement Warranty Program

Since the passage of the 2015 Transportation Package, the CRA has been informing its members of the coming warranty requirement; the *Engineering Updates* provided by the CRA-MML Engineering Specialist have also described the imminent Local Pavement Warranty Program. The CRA provided updates about the Local Pavement Warrant Program at its nine regional Council meetings during fall-winter 2017-2018; at its County Engineers Workshop in February 2018; at its Highway Conference in March 2018, and at its Road Commissioners Conference in April 2018. The CRA is also developing this Guidance Document on Local Pavement Warranties to serve as the training manual for. The CRA has scheduled and dedicated a large portion of its annual 2017 Law Symposium to a session on Implementing the New Local Pavement Warranties on December 5, 2017; speakers include the legal counsel from the Road Commission for Oakland County and CRA-MML Engineering Specialist Steve Puuri. The CRA-MML Engineering Specialist Steve Puuri and two bond counsel representatives provided an update at the Michigan Concrete Association.

In addition, the Local Pavement Warranty Task Force has created an Education Committee that has been developing model agency adoption resolutions and training materials. The Task Force has partnered with the Local Technical Assistance Program to develop and conduct training program for decision makers and project staff. The Education Committee is poised to distribute adoption and training materials upon approval of the Local Agency Pavement Warranty Program by MDOT. Finally, the Task Force has developed this Guidance Document to assist local agency decision makers and project staff with implementing their Local Agency Pavement Warranty program.

MICHIGAN
LOCAL AGENCY
SPECIAL PROVISION
FOR
HOT MIX ASPHALT and CONCRETE PAVEMENT WARRANTY

RJR 4/8/2018

a. **Description.** The Hot Mix Asphalt (HMA) and Concrete Pavement Warranty (Pavement Warranty) consists of the contract warranty provisions, warranty bond, the terms of this special provision, the terms of the special provisions for Warranty Work Requirements for HMA and Concrete Pavements, and the Specifications for Warranty Work included in the contract. This special provision establishes the common terms, definitions, and requirements applied to pavement projects requiring a warranty. The Pavement Warranty assures and protects the Local Agency (Agency) from specific defects in pavements due to materials and/or workmanship.

Under the Pavement Warranty special provisions the Contractor is responsible for correcting defects in the pavement caused by elements within the Contractor's control (i.e., the materials and/or workmanship), during the warranty term. The Pavement Warranty passes through to subcontractors and / or suppliers at the direction of the Contractor and upon written notice to the Agency. The Agency is responsible for the pavement design. Therefore, the Contractor assumes no responsibility for design related defects. A pavement defect due to the materials, workmanship and the design, will result in a shared responsibility for correcting the defect by the Agency and the Contractor. The Contractor is responsible for the percentage of fault attributable to the materials and/or workmanship. The Agency is responsible for the percentage of fault attributable to the design. Note: The Agency elects to require the Contractor to provide the pavement design(s) in *design-build* contract documents and specifications. In this case, the Contractor is responsible for the percentage of fault attributable to the design

b. **Definitions.**

Abrasion. The wearing (loss) of a material by tire friction or snow plowing.

Acceptance Date of Warranted Work. The date when the warranted work is complete, has been determined by the Agency to be in compliance with the contract specifications, and is continuously open to traffic. This is the date of warranted work acceptance (See Section c. Warranted Work Acceptance) and constitutes the start of the warranty period. There may be more than one acceptance date of warranted work for a project.

Adhesion. The bonding of a material to an underlying pavement surface.

Asphalt Flushing. The accumulation of excess asphalt binder on the pavement surface that creates a shiny, reflective condition, and becomes tacky to the touch at high temperatures.

Cohesion. The resistance of a material to internal rupture.

Conflict Resolution Team (CRT). The three-person team responsible for voting in resolution of disputes between the Agency and the Contractor regarding any claim of non-compliance with the warranty requirements.

Local Agency. A road commission or municipality with legal responsibility for the roads or streets within their respective governmental jurisdictions. Sometimes referred to as Agency.

Loss of Cover Aggregate. Areas of coarse and fine aggregate removal from the pavement surface caused by the mechanical action of troweling and/or grooving the concrete surface during placement.

Opening to Traffic. The allowance of vehicles on the new pavement with the appropriate lane markings/ striping and signage.

Over-band. A type of crack sealing in which sealing material is allowed to completely cover prepared cracks by extending onto the adjacent pavement surface.

Raveling. Surface disintegration of a HMA pavement, due to the loss of coarse or fine aggregate material that occurs over an area or in a continuous longitudinal strip. Wear caused by snowplow abrasion is not considered raveling.

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

Scaling. The concrete surface has a visible, exposed, rough texture from a loss of either aggregate or mortar.

Shattered Slab. A concrete pavement slab broken into four or more sections by full-depth cracks.

Spall. Broken or missing piece of concrete contiguous with the perimeter edge of a slab with a surface area exceeding two square inches.

Warranty Bond. A bond (the lesser amount of 5% (percent) of the total contract amount or $1,000,000) issued by a surety which guarantees meeting of the warranty requirements.

Warranted Work. Completed warranted work upon acceptance that is to be evaluated throughout the warranty term.

Warranty Work. Corrective actions / repairs performed to correct deficiencies in the completed warranted work in order to achieve final acceptance (Section I of this special provision) at the end of the warranty term.

Warranty. A surety guarantee that the warranty requirements will be met.

c. **Warranted Work Acceptance**. The Agency and the Contractor must jointly review all completed warranted work, or a portion thereof, as determined by the Agency. If the work does not meet contract requirements, the Contractor must make all necessary corrections, at their expense, prior to acceptance. Warranted work acceptance will occur as soon as the Agency's confirmation is in writing in the Agency's acceptance notice. And that contract requirements have been met for the warranted work and has been continuously open to traffic. The date on which acceptance date of warranted work occurs is the start date for the warranty term.

   Warranted work acceptance will be documented in the Agency's acceptance notice and executed jointly by the Agency and the Contractor. A copy of the acceptance notice will be sent to the Contractor's warranty bond surety agent by the Agency. Neither the warranted work acceptance nor any prior inspection, acceptance or approval by the Agency diminishes the Contractor's responsibility under this warranty.

3. Will be responsible for performing all repairs, resulting from being in non-compliance with the warranty requirements, using Agency approved materials and methods. Corrective actions and/or repairs shall commence before the expiration of the 60-day period of notification unless otherwise approved by the Agency.

4. Will be responsible to perform emergency repairs of the warranted work upon verbal and written notification from the Agency as per Section k. Emergency Repairs in this Special Provision.

5. Must notify the Agency and submit a written course of action for performing the needed warranty work a minimum of 10 (ten) calendar days prior to commencement of warranty work, except in the case of emergency repairs as detailed in this special provision. The submittal must propose a schedule for performing the warranty work and the materials and methods to be used.

6. Must follow an Agency approved maintaining traffic plan when performing warranty work. Ensure all warranty work is performed under permit issued by the Agency's Engineer. The permit fee and an individual permit performance bond will not be required. The permit insurance requirements, however, will apply.

7. Must furnish to the Agency, if warranty work required, a supplemental lien bond covering any warranty work being performed. The supplemental bond is furnished prior to beginning any warranty work. Ensure the supplemental bond is in the amount required by the Agency to cover the costs of warranty work.

8. Must complete all warranty work prior to conclusion of the warranty period, or as otherwise agreed to by the Agency.

9. Will be liable during the warranty period in the same manner as Contractors currently are liable for their construction related activities with the Agency pursuant to the current MDOT Standard Specifications for Construction including, but not limited to subsections 104.07.C, 107.10, and 107.11 or revisions thereto. This liability will 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 will include liability for injuries and/or damages and any expenses resulting therefrom which are not attributable to normal wear and tear of traffic and weather; but are due to non-compliant materials, faulty workmanship, and to the operations of the Contractor as set forth more fully in subsections 104.07.C, 107.10 and 107.11 of the current MDOT Standard Specifications for Construction or revisions thereto.

g. Evaluation Method. The Agency will conduct pavement evaluations by dividing the project into segments. Each individual driving lane will be divided into segments of 528 feet (1/10 mile) in length for measuring and quantifying the condition parameters. The Evaluation Method will include field pavement condition reviews. The Agency reserves the right to waive this evaluation in emergency situations.

The beginning point for laying out segments will be the Point of Beginning (POB) of the project. Segments will be laid out consecutively to the Point of Ending (POE) of the project. The original segmentation of the project will be used for all successive reviews throughout the warranty term.

h. Condition Parameters. Condition parameters are used to measure the performance of the warranted pavement during the warranty term. Each condition parameter threshold limit is applied to each segment and defines the number of allowable defective segments before corrective action (warranty work) is required.

Prior to emergency repairs of warranted work, the Agency will document the basis for the emergency action. In addition, the Agency will preserve documentation of the defective condition.

However, should the Contractor be unable to perform emergency repair requirements, to the Agency's satisfaction and within the time frame required by the Agency, the Agency will perform, or have performed any emergency repairs deemed necessary. Any such emergency repairs undertaken will not relieve the Contractor from meeting the warranty requirements of this special provision. Any costs associated with the emergency repairs will be paid by the Contractor if determined to be the fault of the Contractor.

l. **Final Acceptance.** The Agency and Contractor must jointly review all of the warranted work and any warranty work at the end of the warranty term to determine meeting of contract requirements. The Agency's final acceptance date of warranted work and any warranty work will occur as soon as the Agency's confirmation is in writing, on the Agency's final acceptance notice as jointly executed by the Agency and Contractor And that contract requirements have been met for the warranted work and any warranty work. The Agency will authorize the release of the warranty bond, and with a copy of the final acceptance notice sent to the Contractor's warranty bond surety agent.

m. **Non-extension of Contract.** This special provision must not be construed as extending or otherwise affecting the claim process and statute of limitation applicable to this Contract.

n. **Measurement and Payment.** All costs, including engineering and maintaining traffic costs, associated with meeting the requirements of this special provision are considered to be included in the contract unit prices for the warranted work items_regardless of when such costs are incurred throughout the warranty term or after the end of the warranty term as jointly agreed upon between the Agency and the Contractor. These costs include but are not limited to, all materials, labor and equipment necessary to complete the required warranty work.

MICHIGAN
LOCAL AGENCY
SPECIAL PROVISION
FOR
WARRANTY WORK REQUIREMENTS FOR HOT MIX ASPHALT PAVEMENTS

a. Description. This special provision is for use with MICHIGAN LOCAL ROAD AGENCY SPECIAL PROVISION FOR HOT MIX ASPHALT and CONCRETE PAVEMENT WARRANTY for Local Agency projects constructing a Hot Mix Asphalt (HMA) pavement that will be warranted against defects in workmanship and materials.

Follow Section 501 of the current MDOT Standard Specifications for Construction to determine initial acceptance of a warranted project.

b. Definitions of the Work Types as defined in this specification

Long Term Warranty **-** This includes ***New Construction / Reconstruction*** and HMA placement on an approved aggregate base where the subbase and drainage have been analyzed and determined that the planned improvements meet design life requirements.

Medium Term Warranty– This includes ***Rehabilitation*** and when HMA is placed on an aggregate base, subbase, and/or drainage situation, which was not analyzed to assure that the existing materials and/or planned improvements meet the pavement's design life requirements and the project did not include or improve the base, sub-base and/or drainage. This includes crush-shape-pave projects and other similar 3R work.

Short Term Warranty– This is for ***Overlays*** when HMA is placed on existing HMA, concrete or composite pavement.

c. Terms of the Warranty

Limits of Warranted Work - Warranted work includes all HMA placed in driving lanes in the project limits, unless otherwise indicated on project documents.

Warranty Term – A timeframe which begins at the Acceptance Date of Warranted Work of a completed HMA project. Multi-phased projects may have multiple "Acceptance Dates of Warranted Work." Warranty term length is specified in Table 1

Warranty Bond - The Contractor shall furnish a single term bond worth 5% of the total contract or $1,000,000 whichever is less, secured in the name of the road owner and/or the agency in charge of the project. The effective starting date of the warranty bond will be the Acceptance Date of Warranted Work. The warranty bond will be released at the end of the warranty period or upon satisfactory completion of all warranty work; whichever is later.

Warranty Requirements - Table 1 lists maximum allowable defect thresholds for each condition per 1/10-mile lane segments and the maximum allowable number of defective segments for each condition parameter. If the Contractor has exceeded any warranty requirement, even in non-contiguous segments, the Engineer will request warranty fixes.

Each Driving lane will be assessed separately. Any warranty work required of the Contractor to correct deficiencies for any condition, will be full-width across the entire driving lane.

a. For a single course overlay, or multiple course overlays less than 2" thick, transverse and longitudinal cracking will not be warranty conditions.

b. For segments less than 1/10 mile in length, divide the segment length in feet by 528. The multiply the threshold limit shown in the table by this fractional number. Round the result to the nearest whole number for the new threshold limit. In no case can the threshold limit be less than 1.

The maximum allowable number of defective segments per condition for a specific driving lane is determined by multiplying the length of the specific driving lane in miles by the maximum allowable defective segments per mile as shown in the table for that condition. Round all fractional values n to the nearest whole number. In no case can the max. segments per driving lane limit be less than 1.

c. The Engineer shall waive this requirement if it is determined the cracks are reflective cracks from the surface being overlaid.

d. Rut-depth threshold applies to each wheel path individually.

e. For single course overlays constructed on existing rutted pavement without first milling, wedging or otherwise fixing the existing ruts > 1/2 inch, the Engineer shall waive this requirement.

f. The Engineer will evaluate for rutting throughout the warranty period. If rutting is found in a 1/10-mile segment, the rutting will be measured in that segment at the POB and every 132 feet thereafter.

The Engineer will take rut measurements with a straight, rigid device at least 7 feet long that does not deflect from its own weight, or a wire that remains taut when extended 7 feet. The Engineer will place across the pavement, perpendicular to travel with at least one bearing point on either side of a rut. The straightedge is properly located when sliding it along its axis does not change these contact points. The Engineer will measure rut depth at the greatest distance from the bottom of the straightedge to the bottom of the paved rut.

g. Any amount of alligator and/or block cracking is unacceptable, and must be removed and replaced as directed by the Engineer.

Table 2: Suggested Corrective Actions

Condition Parameter	Recommended Action
Transverse cracking	Seal, or cut/seal (per Engineer direction)
Longitudinal cracking	Seal, or cut/seal (per Engineer direction)
De-bonding	Mill, resurface affected courses
Raveling	Mill, resurface affected courses
Flushing	Mill, resurface affected courses
Rutting	Microsurface or mill/resurface (a)
Alligator or block cracking	Remove and replace (b)

Note: The actual fix approved by the Engineer may differ from these suggestions.

a. The Engineer's recommended action depends on rut depth.

b. Removal and replacement will be required for any areas exhibiting alligator or block cracking to the extent and depth of the cracking.

MICHIGAN
LOCAL AGENCY
SPECIAL PROVISION
FOR
WARRANTY WORK REQUIREMENTS FOR JOINTED PLAIN CONCRETE PAVEMENT

a. Description. This special provision is for use with MICHIGAN LOCAL ROAD AGENCY SPECIAL PROVISION FOR HOT MIX ASPHALT and CONCRETE PAVEMENT WARRANTY for construction/reconstruction projects using jointed concrete pavement on an unbound or stabilized aggregate base that will be warranted against defects in workmanship and materials.

When a local agency concrete project is to be warranted, its Initial Acceptance shall follow Section.602 of the current MDOT Standard Specifications for Construction.

b. Terms of the Warranty

Limits of the Warranted Work - Warranted work includes all jointed plain concrete pavement placed in driving lanes within the project limits, unless described otherwise on the plans.

Warranty Term - A timeframe which begins at the Acceptance Date of Warranted Work of a completed Concrete Pavement project. Multi-phased projects may have multiple "Acceptance Dates of Warranted Work." The Warranty Term will last five (5) years, unless otherwise specified in the contract.

Warranty Bond - The Contractor shall furnish a single term bond worth 5% of the total contract or $1,000,000 whichever is less, secured in the name of the road owner and/or the agency in charge of the project. The effective starting date of the warranty bond will be the Acceptance Date of Warranted Work. The warranty bond will be released at the end of the warranty period or upon satisfactory completion of all warranty work; whichever is later.

Warranty Requirements - Table 1 lists maximum allowable defect thresholds for each condition per 1/10th-mile lane segments and the maximum allowable number of segments for each condition parameter. If the Contractor has not met any warranty requirement, even in non-contiguous segments, the Engineer will request warranty fixes.

Each driving lane will be assessed separately. Any warranty work required of the Contractor to correct deficiencies for any condition, will be full-width across the driving lane.

c. Quality Control / Quality Assurance (QA/QC). The Contractor is responsible for project quality and must provide QC testing procedures and results.

The Engineer will perform Quality Assurance (QA) testing as a spot-check to determine Initial Acceptance or assess penalties if specifications are not met. QA testing does not relieve the Contractor of QC responsibilities. A Contractor may not use QA tests as evidence in a warranty dispute.

d. Initial Ride Quality Acceptance. Initial Ride Quality requirements are outlined in the bid documents.

Table 2: Recommended Corrective Action

Condition Parameter or Defect	Recommended Action (a)
Longitudinal Cracking (b)	Retrofit load transfer
Transverse Cracking (b)	Retrofit load transfer
Corner Cracking	Full-depth, tied, concrete patch
Map Cracking	Remove and replace
Spalling	Repair with epoxy or cement mortar (c)
Surface Scaling	Diamond grind surface (d)
Joint Sealant Failure	Remove and replace seal material (e)
Shattered Slab	Full depth slab replacement (f)

a. If multiple defects are present, the Engineer may revise the recommended actions, up to and including removal and replacement.
b. The Engineer's requested corrective treatment will depend on the crack's location and depth. Full-depth T-cracks require retrofit load transfer (> 90% load transfer efficiency) as a minimum. Full depth/full length L-cracks require slab removal and replacement, if outside influence of lane ties.
c. The Engineer's requested repair depends on the area and depth of spall, relying on most current specifications in the MDOT Material's Technology Section, Construction and Technology Division.
d. Diamond grinding applies to entire slab surface area where scaling exists.
e. Replace with existing material type. Neoprene seals are removed and replaced full-width.
f. All shattered slabs must be removed and replaced.