

# Harmonizing Ontario's HMA Specifications

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**ORBA**



**STRONGER TOGETHER**

# Presentation Outline

- **Recap: Present Concerns and Solution**
- **Why Harmonize?**
- **Evaluation Focus**
- **Conclusion**
- **Next Steps**



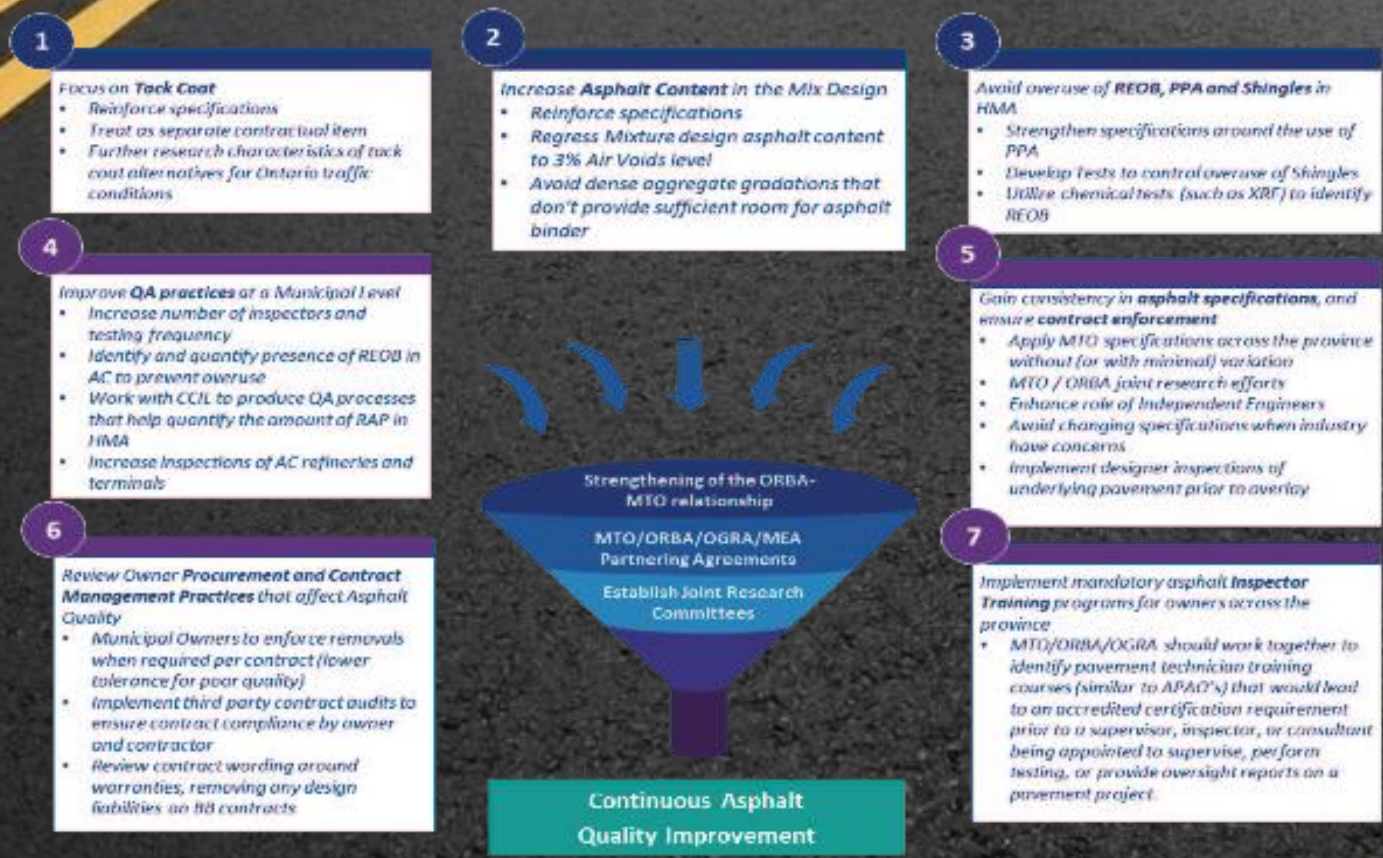
# Recap: Present Concerns

- Dense aggregate gradations that did not provide sufficient room for the asphalt binder in the mixture, leading to mixes that were more susceptible to early cracking,
- The lack of bonding between layers of hot mix asphalt (“HMA”), which were related to the quality of specifications and oversight of tack coat application;
- Cracks that reflected from lower pavement layers through asphalt overlays

## ASPHALT CEMENT QUALITY

# Recap: Solutions

## CONTINUOUS IMPROVEMENT FRAMEWORK



1

**Focus on Tack Coat**

- Reinforce specifications
- Treat as separate contractual item
- Further research characteristics of tack coat alternatives for Ontario traffic conditions

2

**Increase Asphalt Content in the Mix Design**

- Reinforce specifications
- Regress Mixture design asphalt content to 3% Air Voids level
- Avoid dense aggregate gradations that don't provide sufficient room for asphalt binder

3

**Avoid overuse of REOB, PPA and Shingles in HMA**

- Strengthen specifications around the use of PPA
- Develop tests to control overuse of Shingles
- Utilize chemical tests (such as XRF) to identify REOB

4

**Improve QA practices at a Municipal level**

- Increase number of inspectors and testing frequency
- Identify and quantify presence of REOB in AC to prevent overuse
- Work with CCIL to produce QA processes that help quantify the amount of RAP in HMA
- Increase inspections of AC refineries and terminals

5

**Gain consistency in asphalt specifications, and ensure contract enforcement**

- Apply MTO specifications across the province without (or with minimal) variation
- MTO / ORBA joint research efforts
- Enhance role of Independent Engineers
- Avoid changing specifications when industry has concerns
- Implement designer inspections of underlying pavement prior to overlay

6


**Review Owner Procurement and Contract Management Practices that affect Asphalt Quality**

- Municipal Owners to enforce removals when required per contract (lower tolerance for poor quality)
- Implement third party contract audits to ensure contract compliance by owner and contractor
- Review contract wording around warranties, removing any design liabilities on BB contracts

7

**Implement mandatory asphalt Inspector Training programs for owners across the province**

- MTO/ORBA/OGRA should work together to identify pavement technician training courses (similar to APACT's) that would lead to an accredited certification requirement prior to a supervisor, inspector, or consultant being appointed to supervise, perform testing, or provide oversight reports on a pavement project.

 Technical Recommendations

 Non-Technical Recommendations

**Continuous Asphalt Quality Improvement**



# Why Harmonize?



ONTARIO  
PROVINCIAL  
STANDARD  
SPECIFICATION

METRIC  
OPSS.MUNI 1101  
NOVEMBER 2016

**MATERIAL SPECIFICATION FOR  
PERFORMANCE GRADED ASPHALT CEMENT**

TABLE C

1101.01	SCOPE
1101.02	REFERENCES
1101.03	DEFINITIONS
1101.04	DESIGN AND SUBMISSIO
1101.05	MATERIALS
1101.06	EQUIPMENT – Not Used
1101.07	PRODUCTION
1101.08	QUALITY ASSURANCE
1101.09	OWNER PURCHASE OF I



ONTARIO  
PROVINCIAL  
STANDARD  
SPECIFICATION

METRIC  
OPSS.MUNI 1151  
April 2018

**MATERIAL SPECIFICATION FOR  
SUPERPAVE AND STONE MASTIC ASPHALT MIXTURES**

TABLE O

1151.01	SCOPE
1151.02	REFERENCES
1151.03	DEFINITIONS
1151.04	DESIGN AND SUBMISSIO
1151.05	MATERIALS
1151.06	EQUIPMENT
1151.07	PRODUCTION
1151.08	QUALITY ASSURANCE
1151.09	OWNER PURCHASE OF I



ONTARIO  
PROVINCIAL  
STANDARD  
SPECIFICATION

METRIC  
OPSS 1150  
NOVEMBER 2008

**MATERIAL SPECIFICATION FOR  
HOT MIX ASPHALT**

TABLE OF CONTENTS

1101-A	Commentary
1101-B	Additional Requirements Graded for Traffic Loadin



ONTARIO  
PROVINCIAL  
STANDARD  
SPECIFICATION

OPSS.MUNI 310  
November 2017

**CONSTRUCTION SPECIFICATION FOR  
HOT MIX ASPHALT**

TABLE OF CONTENTS

1101.01	SCOPE
1101.02	REFERENCES
1101.03	DEFINITIONS
1101.04	DESIGN AND SUBMISSION REQUIREMENTS
1101.05	MATERIALS
1101.06	EQUIPMENT
1101.07	PRODUCTION
1101.08	QUALITY ASSURANCE
1101.09	OWNER PURCHASE OF

APPENDICES

1151-A	Commentary
1151-B	Use of over 15% RAP by

1151.01	SCOPE
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This specification covers the requirements for the and mixing hot mix asphalt (HMA) including warm r work according to the Superpave and SMA mix de

1151.01.01	Specification Significance and U
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This specification is written as a municipal-orient developed to reflect the administration, testing, an municipalities in Ontario.

Use of this specification or any other specification :

APPENDICES

1150-A	Commentary
1150-B	Marshall Stability Design Criteria for Lower Traffic
1150-C	Marshall Stability Design Criteria When 100% Cru
	Aggregates Used in HL 3HS Do Not Apply

1150.01	SCOPE
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This specification covers the requirements for the materials, equipment, and proportioning and mixing hot mix asphalt, including recycled mixes and mixes

1150.01.01	Specification Significance and Use
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This specification has been developed for use in provincial- and municipi administration, testing, and payment policies, procedures, and practices re correspond to those used by many municipalities and the Ontario Ministry of T

Use of this specification or any other specification shall be according to the Cc

310.01	SCOPE
310.02	REFERENCES
310.03	DEFINITIONS
310.04	DESIGN AND SUBMISSION REQUIREMENTS - Not Used
310.05	MATERIALS
310.06	EQUIPMENT
310.07	CONSTRUCTION
310.08	QUALITY ASSURANCE
310.09	MEASUREMENT FOR PAYMENT
310.10	BASIS OF PAYMENT

APPENDICES

310-A	Commentary
310-B	Supplemental Requirements for Using the MTO Performance Graded Asphalt Cement (PGAC) Price Index in Municipal Contracts
310-C	Supplemental Requirements for Using Warm Mix Asphalt in Municipal Contracts

310.01	SCOPE
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This specification covers the requirements for the placement and compaction of hot mix asphalt designed using the Marshall or Superpave methods.

310.01.01	Specification Significance and Use
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This specification is written as a municipal-oriented specification. Municipal-oriented specifications are developed to reflect the administration, testing, and payment policies, procedures, and practices of many municipalities in Ontario.

Use of this specification or any other specification shall be according to the Contract Documents.

<p><u>Mix Design</u></p> <p>Marshall Superpave SMA WMA</p>	<p><u>RAP USAGE</u></p> <p>Allowed RAP Percentage Surface/Binder</p>	<p><u>PGAC Specification</u></p> <p>PG 58-28 PMA DENT/EXBBR MSCR Recovered PGAC</p>
<p><u>HMA Acceptance Criteria</u></p> <p>AC Content Gradation Compaction</p>	<p><u>Tack Coat Specification</u></p> <p>Types Application Practices</p>	

# Evaluation Focus: Mix Design

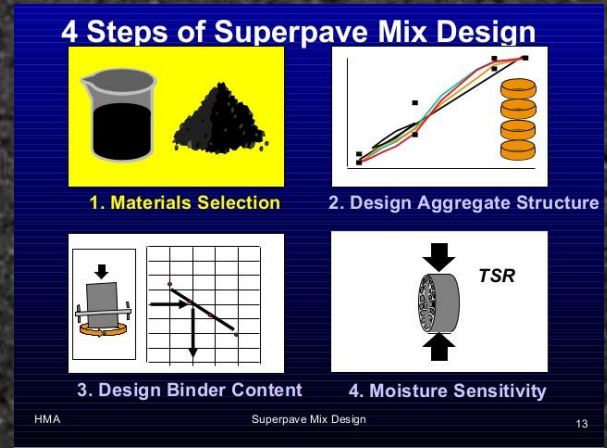
## Consensus Requirements:

- Increasing Asphalt Cement Content
- Use of Recycled Material
- Mixing and Compaction Temperatures
- Production Technologies
- Use of Additives
- Proportioning Mineral Fillers
- Use of Distinct Specifications - WMA

### Marshall Mix Design Procedure

Typical Marshall Design Criteria

Mix Criteria	Light Traffic (< 10 <sup>4</sup> ESALs)		Medium Traffic (10 <sup>4</sup> – 10 <sup>5</sup> ESALs)		Heavy Traffic (> 10 <sup>5</sup> ESALs)	
	Min.	Max.	Min.	Max.	Min.	Max.
Compaction (number of blows on each end of the sample)	35		50		75	
Stability (minimum)	2224 N (500 lbs.)		3336 N (750 lbs.)		6672 N (1500 lbs.)	
Flow (0.25 mm (0.01 inch))	8	20	8	18	8	16
Percent Air Voids	3	5	3	5	3	5





# Evaluation Focus: RAP Usage

## Concerns:

- Premature Cracking
- Limitations to RAP Use
- Additional Test Requirements
- Environmental & Economic Consequences





# Evaluation Focus: PGAC Specifications

## Concerns:

- Acceptance and Rejectable Criteria
- Inconsistencies with Test Procedures
- AC/Binder Literacy



# Evaluation Focus: HMA Acceptance Criteria

## Concerns:

- Need for Adequate QC/QA Practices
- Sampling Methods
- Acceptance Plans
- Imposed Penalties on Non-conformance



# Evaluation Focus: Tack Coat Specification

## Current Types:

- SS-1 Emulsified Asphalt
- SS-1 H
- MS-1

## Application Practices:

- Milled Surfaces
- Padded Surfaces
- Paved Surfaces

The goal of harmonization is to eliminate specification proliferation.

- **Timely Communication of Construction Notices**
- **General Compliance with Latest OPSS Specifications**
- **Selecting Criteria Impacting on Mix Volumetrics and Density Requirements**
- **Rationale for Selecting Test Procedures, Setting Criteria and Limits**
- **Personnel Training**
- **Strong Commitment from ALL Stakeholders**



# Next Steps

- Engage with Specifiers on Ways to Achieve Durable HMA Pavements:
  - Discuss to Better Understand These Specifications
- Encourage the NEED to Harmonize Specifications

**THANK YOU FOR LISTENING**