



Walker Industries

- Established 1887
- 5 Generations
- Aggregate
- Hot Mix Asphalt
- Paving
- Asphalt Emulsion
- Pavement Preservation
- Contracting
- Landfill
- Waste Transfer
- Environmental Services



Pavement Preservation

- Norjohn since 1973
 - Tack Coat
 - Dust Control
 - Surface Treatment
 - Chip Seal
 - Micro-Surfacing
 - Cold Recycled Mix
 - Open Graded Mix
 - FiberMat™
 - **Bonded Wearing Course**
 - **Investigating New Technologies – Scrub Seal**



Scrub Seal

Norjohn is interested in adding Scrub Seal to our repertoire of pavement preservation techniques.

1. Equipment to place the material and “scrub” it into the surface.
2. A modified asphalt emulsion suitable for scrub seal.
3. A customer willing to try scrub seal, in a trial of suitable size that we can monitor its effectiveness (under different conditions, vs. traditional techniques, vs. other techniques etc.).
4. An independent party that investigates the selected roads, before, during and after placement with regular follow up.



Scrub Seal

- A scrub seal is a crack-filling, sealing and rejuvenating seal.
- An asphalt emulsion is sprayed and scrubbed mechanically with a broom into small cracks and other surface imperfections.
- The emulsion may also contain polymers, crumb rubber or rejuvenating oils.
- A chip spreader then applies a layer of aggregate aggregate onto the surface placing and into the emulsion-filled cracks and voids.
- A pneumatic tire roller is then used over the seal.



Scrub Seal



Scrub Seal



Scrub Seal



Scrub Seal

- Scrub seals are designed for use on structurally sound asphalt pavements with minor to moderate surface defects.
- A scrub seal fills and seals low to moderate severity cracks and other surface defects, seals and protects asphalt pavements from sunlight, rain and snow, smoothes surface texture, inhibits raveling, protects underlying pavement structure and extends pavement life.
- Scrub seals save money and time by reducing or eliminating the need for sealing the cracks prior to applying the asphalt surface treatment.



Scrub Seal

- https://www.youtube.com/watch?v=LV4o-C_FUFA



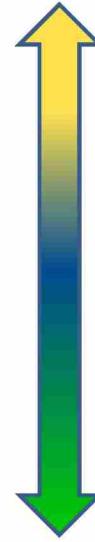
Scrub Seal

- Scrub seals are not appropriate over rutted, potholed or rough surfaces, over unstable pavement structures or over pavements with poor drainage.
- Scrub seals should be constructed when the weather will be dry and warm enough to allow thorough curing.
- The emulsion must be tested for ability to be “scrubbed” without breaking.
- The equipment and expertise may not be available everywhere.

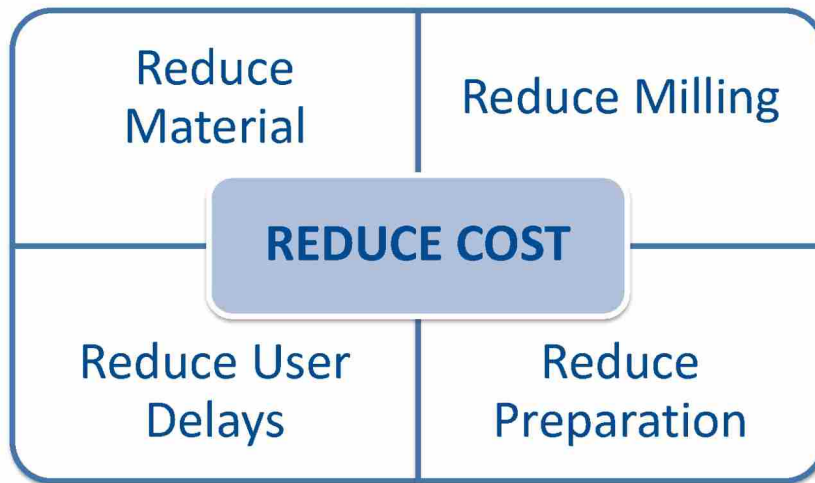


Bonded Wearing Course

- Integration
 - Aggregates
 - Hot Mix
 - Asphalt Emulsion
 - Pavement Preservation Contracting
 - Customers
- Earth 1st
 - Reduce Impact
 - Materials
 - Emissions – Warm Mix capabilities
 - Cost to the Customer
 - Leadership
 - Commitment to the Ontario Market



Bonded Wearing Course



Bonded Wearing Course

- Bonded Wearing Course (BWC) is a gap graded, ultra thin hot mix asphalt (HMA) applied over a thick polymer modified asphalt emulsion membrane with a specialized paver



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- Hot Mix Plant
- Warm Mix

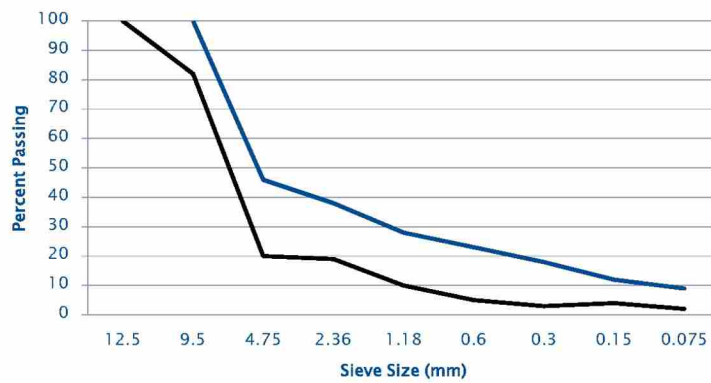


Bonded Wearing Course

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- 9.5mm
- 12.5mm

Gap Graded Aggregate



Bonded Wearing Course

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- 14mm
- 19mm



Bonded Wearing Course

- Bonded Wearing Course (BWC) is a gap graded, ultra thin hot mix asphalt (HMA) applied over a **thick** polymer modified asphalt emulsion membrane with a specialized paver

0.6 – 1.2 litres/m²



Bonded Wearing Course

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- Rapid break
- Polymer modified
- CRS-1P

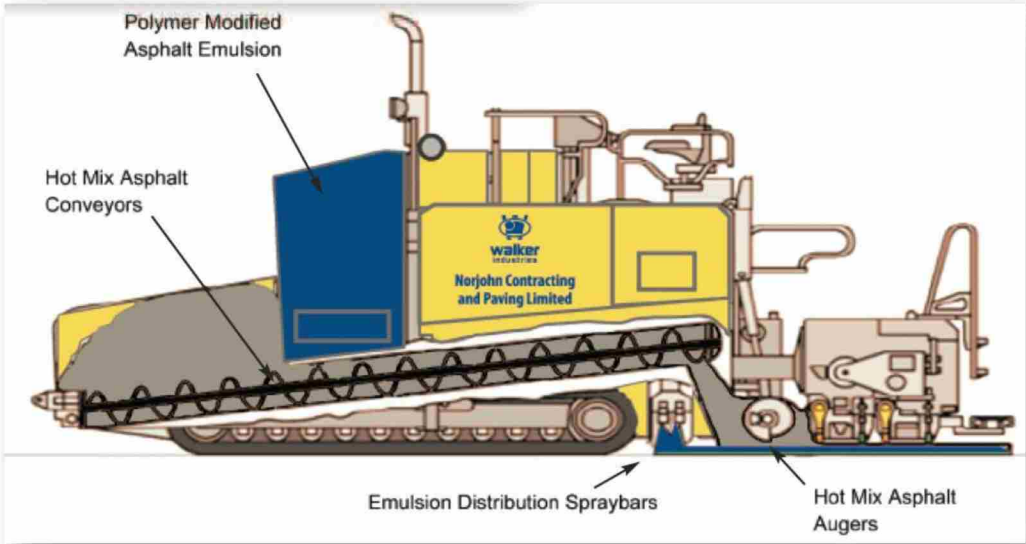


Bonded Wearing Course

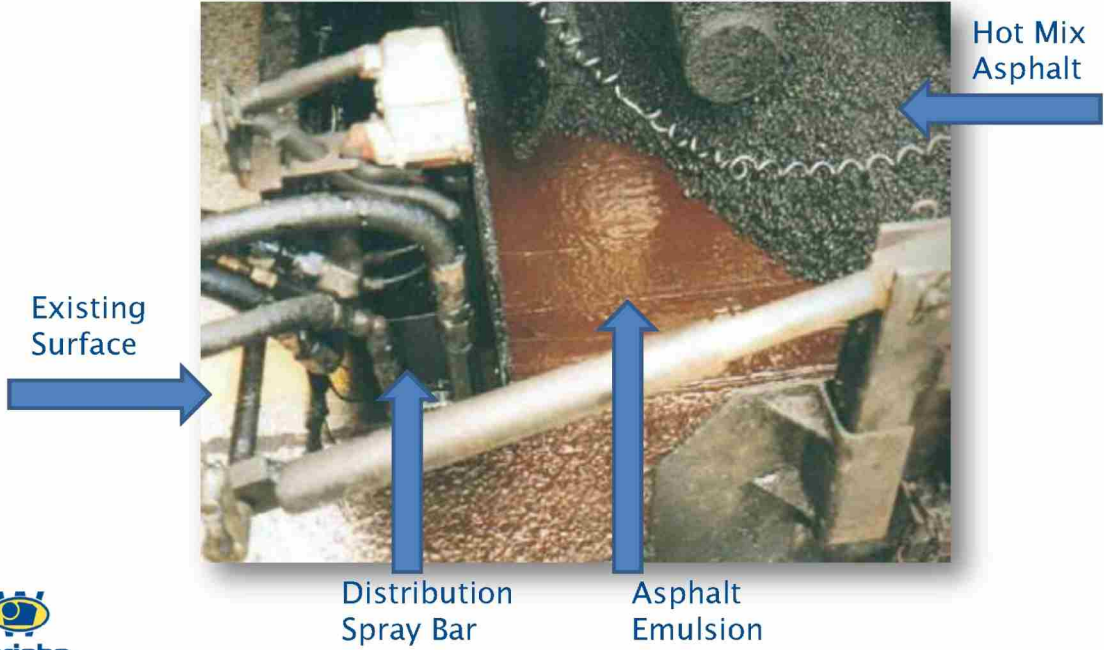
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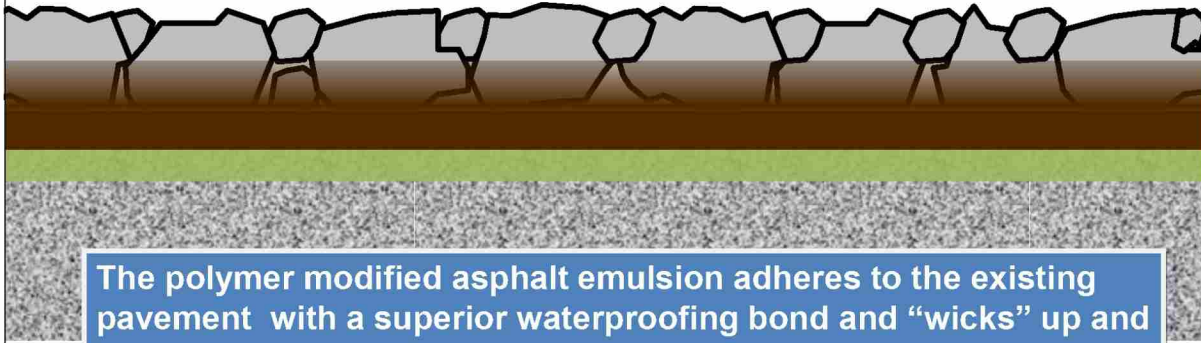
“Spray” Paver



“Spray” Paver



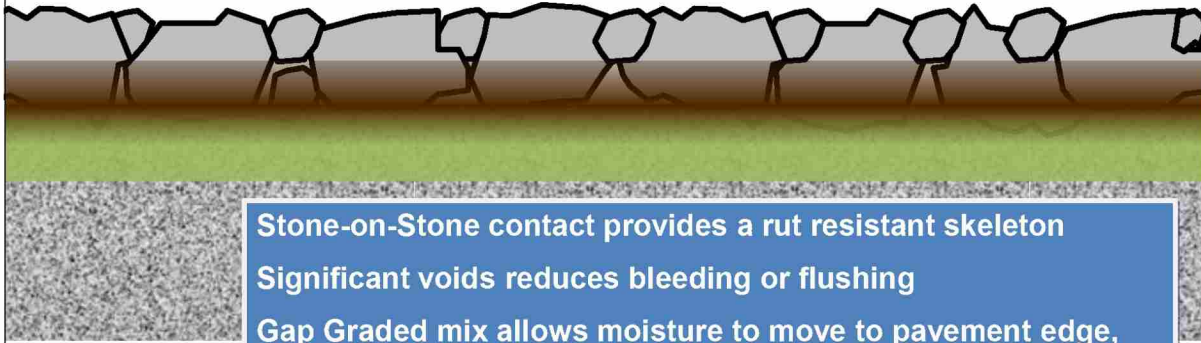
Bonded Wearing Course



The polymer modified asphalt emulsion adheres to the existing pavement with a superior waterproofing bond and “wicks” up and around the coated HMA aggregate.



Bonded Wearing Course

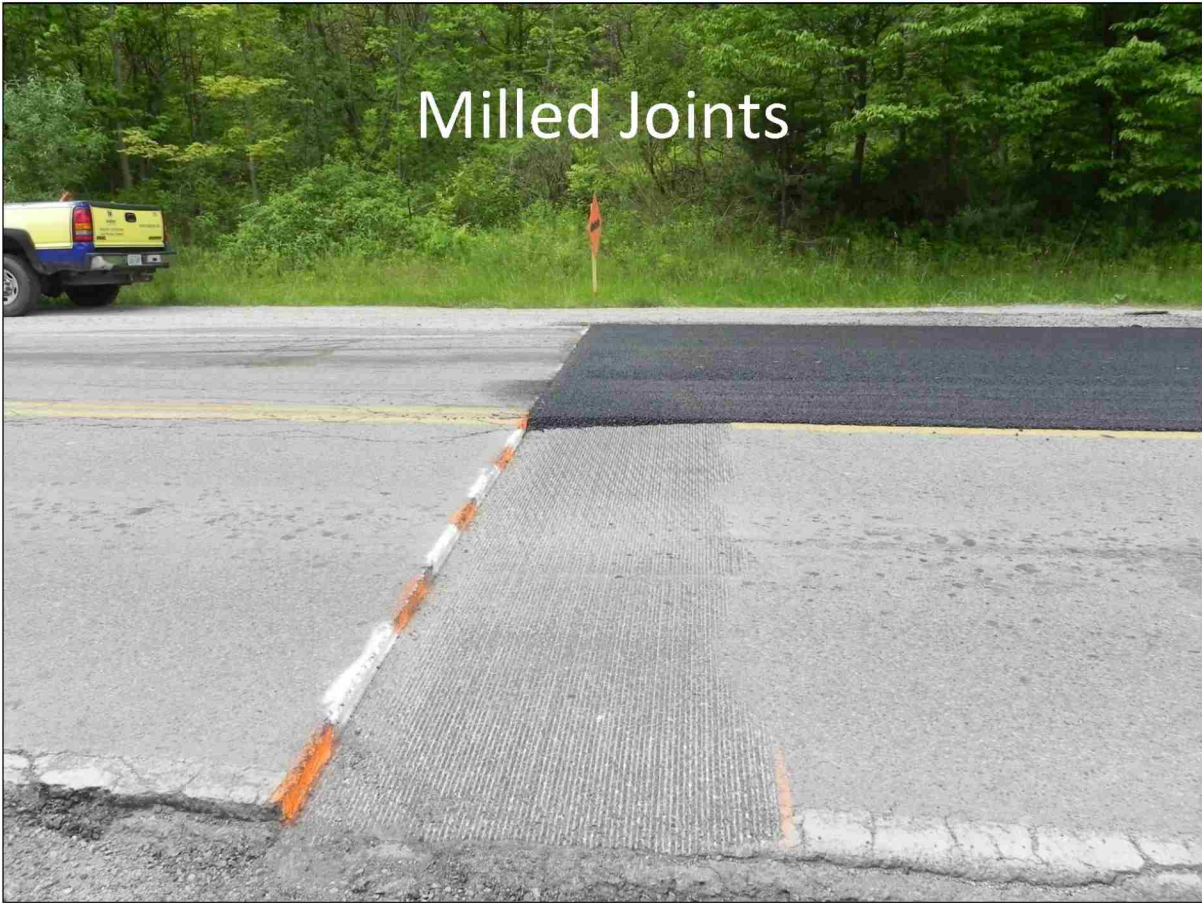


Stone-on-Stone contact provides a rut resistant skeleton
Significant voids reduces bleeding or flushing
Gap Graded mix allows moisture to move to pavement edge,
improving skid resistance and back spray

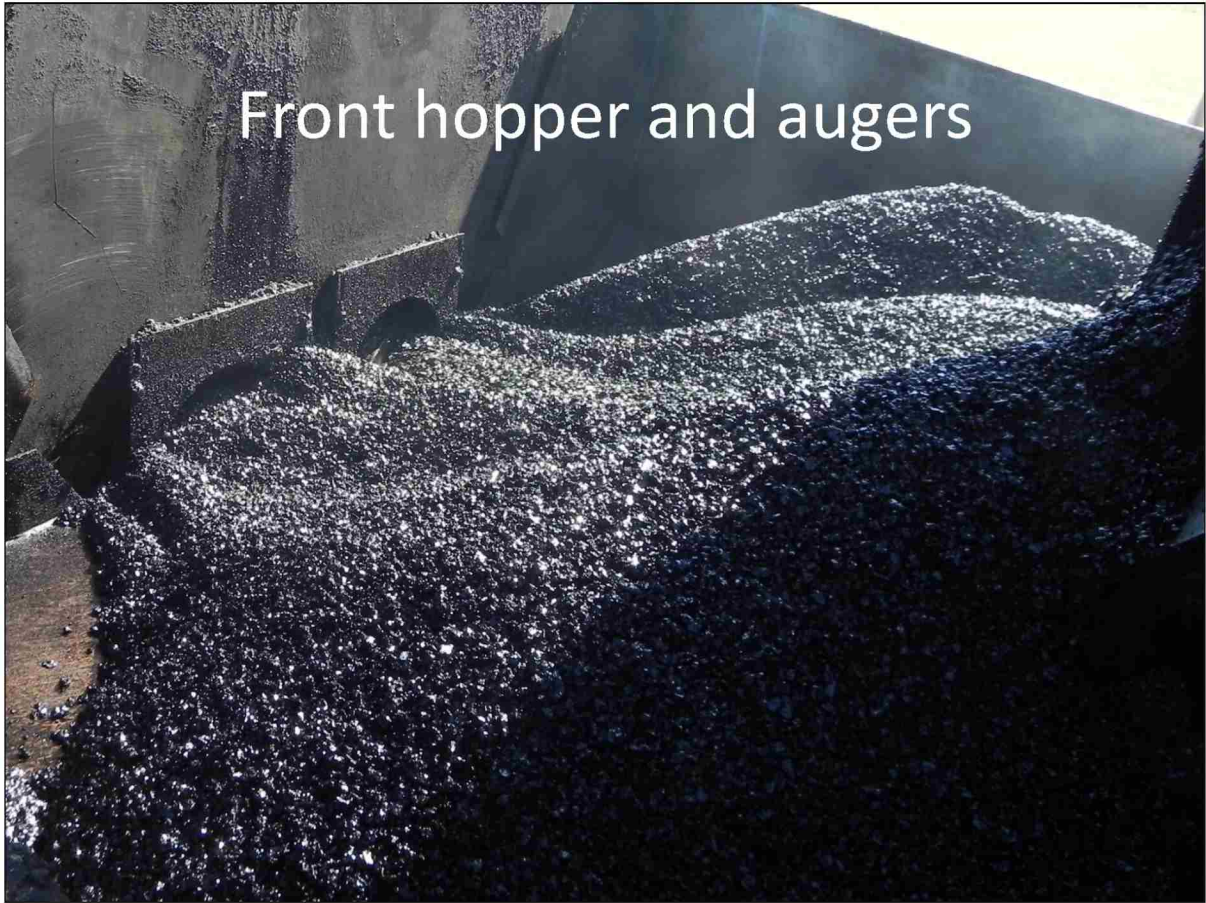




Milled Joints



Front hopper and augers



Paver Controls



Spray Bar and Screed





Back of the screen

20 m per minute



Dual drum steel roller

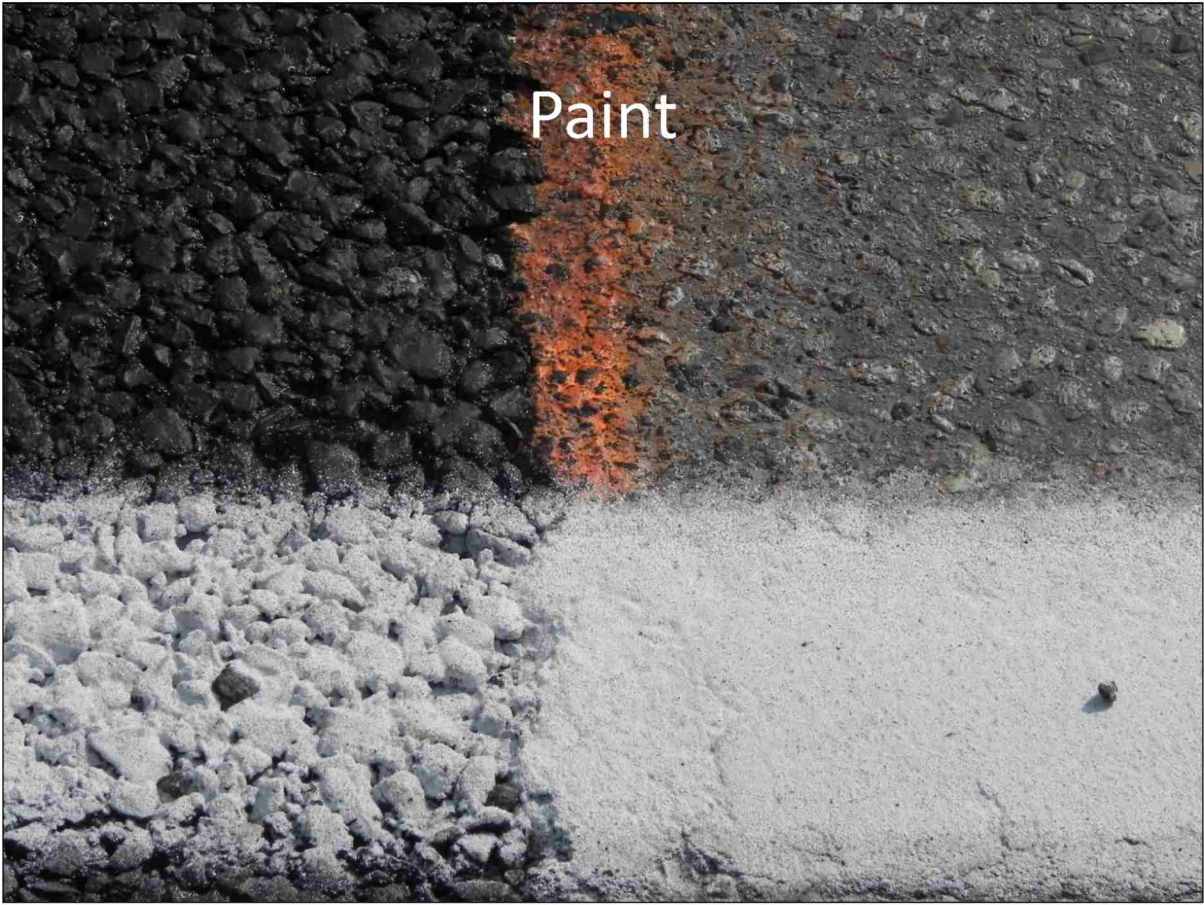




Emulsion recharge







Completed Project



Bonded Wearing Course

(Trial for LINC and RHVE – on Dartnall ramp)

- **Lowers Life-Cycle Costs**
 - Durable
 - Crack-Resistant
- **Superior Bond with PMA Emulsion**
 - Seals out Water
 - Resists Raveling and Delamination
- **Open Macro-Texture provides**
 - Excellent Skid Resistant
 - Quick Drainage to Edge of Pavement
 - Reduces Tire Backspray
 - Reduces Noise
- **Minimizes Milling**
- **Tack Coat is built in**
- **Reduces need for additional Shoulder Material**



Bonded Wearing Course

- New Construction Overlay
- Pavement Preservation Treatment
- Corrective treatment
 - Addressing Specific Concerns
- Flexible Pavements
- Portland Concrete Cement Pavements
- All Traffic Levels
 - Residential Streets
 - Urban Collectors and Arterials
 - 400 Series Highways



Ongoing studies







BWC – corrective actions

BWC – corrective actions



BWC – corrective actions





BWC

CRM

Bonded Wearing Course

- Limitations
 - Thin Flexible Surface – Not Structural Layer
 - To be placed on structurally sound pavements
 - Low temperatures
 - Freezing conditions
 - Wet surfaces







QUESTIONS ?

