

Pavement Preservation Conference
and Technology Implementation
Puerto Rico Nov. 14-17, 2011

Bridge Preservation

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Deck Preservation Program

- Establish specific goals of the program
- Set performance levels to determine the effectiveness of the program
- Identify bridge elements to receive preservation treatments
- Determine materials/treatments specific to each element
- Program treatment cycles
- Determine the effectiveness of the materials and treatments
- Modify Preservation Program (materials/treatments) if necessary

Bridge Preservation Treatments

- Joints and Headers
- Partial and Full Depth Concrete Repairs
- Deck Treatments

Joints And Headers

Pre-formed Seal Silicone



Joints And Headers

Pre-formed Polymer Foam



Joints And Headers

Poured Urethane



Joints And Headers

Pre-formed Compression Seals



Joints And Headers

Polyurethane Elastomeric Headers



Joints And Headers

Methyl Methacrylate Headers



Joints And Headers

Asphaltic Plug Joints



Joints And Headers

Preservation and Repair

- Annual inspection and cleaning of debris
- Re-apply adhesive on un-bonded locations
- Remove and replace joint sections that are torn or perforated
- Maintain headers and joint bonding surfaces.

Partial and Full Depth Concrete Repairs Materials

- Portland Cement Concrete
 - 28 Day Cure
 - Curing Compound (Wet Cure)

- Fast Setting Concrete
 - 1-4 Hour Cure
 - Wet Cure

- Polymer Concrete
 - 1 Hour Cure
 - Dry Cure

Proper Repair Procedure

- Determine the extent of the repair area
 - Chain drag
 - Hammer sounding
 - Ground penetrating radar (GPR)

- Preparation
 - Saw cut perimeter
 - Jackhammer damaged area (30lb max)
 - Sand blast reinforcing
 - Clean with dry compressed air



Proper Repair Procedure

- Mixing/Placing of Repair Material
 - Mixing equipment
 - Vibration
 - Finishing
- Curing
 - Wet cure
 - Curing compound
 - Dry cure



Importance of Deck Preservation

- Deterioration Can Expand Very Quickly
- Public Serviceability, Opinion and Safety
- Rehabilitation and Replacement is Expensive
- Preservation Treatments are Cost Effective
- Preservation Treatments Extend Serviceable Life

Deck Treatments

- Surface and Crack Sealing
- Wearing Surface
 - Skid Resistance
 - Waterproofing
 - Wearing Surface

Bridge Deck

Surface and Crack Sealing

- When is the Best Time to Seal Surfaces and Cracks
 - New Construction/Rehabilitation
 - Existing Decks with Cracking
 - Decks with Cracking and Extensive Spalling - (?)



Surface and Crack Sealing Materials

- Silane and Siloxane
water or solvent based (percent active solution)
- Linseed Oil
- Methyl Methacrylate & High Molecular Weight Methacrylate
- Low Viscosity Epoxy

Surface Sealers

- Silane/Siloxane/Linseed Oil
 - Make surface porosity and smaller cracks hydrophobic
 - Will not seal larger cracks
 - Must be re-applied to decks to maintain effectiveness
 - Low initial cost
 - Easy to apply

Surface and Crack Sealers

- Methyl Methacrylate, High Molecular Methacrylate, Low Viscosity Epoxy
 - Seal surface porosity and cracks
 - Good penetration into cracks and seal with cured material
 - Reapplication not required
 - Higher cost
 - Easy to apply

Very Thin and Thin Overlays

- Protect concrete deck from intrusion of moisture
- Reduce corrosion potential
- Increase skid resistance
- Easily maintained
- Low initial cost
- Long service life

Deck wearing Surfaces

- **Very Thin (1/4" – 1/2")**

 - Methyl Methacrylate and Epoxy**

 - Dead load 3 – 4 lbs/ sq ft
 - Service life approx 20 years

- **Thin (3/4" – 1 1/2")**

 - Polyester and Latex Modified Concrete**

 - Dead load 17.5 lbs/ sq ft
 - Service life approx 20 years

Very Thin Overlays

Epoxies and Modified Epoxies (1/4"-1/2")

Application Methods

- Multi-Coat Broom and Seed (ACI 548.07)
 - Specialized Mixing Equipment
 - Standard Labor and Tools



Very Thin Overlays

Epoxies and Modified Epoxies (1/4"-1/2")

Application Methods

- Slurry (ACI 548.08)
 - Mechanical Mixing Machines
 - Standard Labor and Tools



Very Thin Overlays

Methyl Methacrylate (1/4"-3/8")

Application Method

- Slurry Application (ACI 548.10)
 - Mechanical Mixing Machines
 - Standard Labor and Hand Tools



Thin Overlays

Polyester (3/4 - 1 1/4")

Application Method



- Resin/Aggregate Mortar
 - Special Mixing Equipment
 - Vibratory Screed (Compaction)
 - Tine Surface Profile

Thin Overlays

LMC (Latex Modified Concrete)

Application Method

- Cement/Aggregate/Liquids
(ACI 548.04)
 - Special Mobile Mixer
 - Finishing Machines/
Vibratory Screed



Thank You!

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