

DECK PRESERVATION REPORTS

2012 SEBPP Conference
Atlanta, GA

Group number: Table 2

Discussion topic: Deck Preservation

Discussion Highlights (note main discussion items)

- Deck comments-Cleaning bridge decks regular maintenance prolongs the deck by doing this.
- Cycle of cleaning spring and fall. Have decks clean go into winter months-freeze and thaw.
- Life of the concrete, rain, spalling, deterioration of the rebar.
- 10" decking then years later grind off you still have 3" to rebar then overlay to preserve decking
- Maintenance plan for bridges

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- Have a plan for the structure schedule from new to every year
- Condition rating 5 or better for looking at bridges in good condition.
- Bridge washing spring and fall

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Have a preventive maintenance plan
- Have a plan and write it down and stick with it

Group number: 3

Discussion topic: Deck Preservation

Discussion Highlights (note main discussion items)

- Joint types that are currently used - Silicone, preformed compression, strip seals, finger joints, evazote. Performance seems as expected, pulling loose, drying out, those types of problems emerge. Timeframes are typically within 2-3 years for when this happens.
- Types of Mat'l working well for concrete surface repairs - Surtreat conc. rehab product (liquid form) prevents damage, displaces damaging elements and rejuvenates Portland cement. Asphalt (cold patch) poor performance, puts people at risk. Polymer concrete is used for less than 10SquareFoot repairs - in Puerto Rico.
- Age or condition for crack sealing - Typically it is recommended on each inspection to address cracking. 1/8" to 1/4" is the general condition when cracks are repaired.
- Deck cleaning - Not aware of much guidance given by states on cleaning decks.
- Scoping deck preservation - More interest seems to come from the local and municipal levels than state.

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- Fly ash used in concrete in Puerto Rico to prevent deck cracking.

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- States would develop a state specific plan in conjunction with FHWA on addressing deck cracking.
- States should decide on a frequency for deck cleaning and refer to the Bridge Preservation Guide as per FHWA.
- Checklist near the end of the construction phase with clear and detailed explanation of steps taken with regard to deck preservation.
- Better communication about resources available between FHWA, states, local governments, etc.
- More presentations at these types of conferences about the Guides as they come out

Group number: Table 4

Discussion topic:

Discussion Highlights (note main discussion items)

- Concrete surface repairs

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- shallow spalls fibercrete hard to take out temperature affects rebar
- latex overlay on a new deck-70's still ok some overlay collapse failure material underneath
- 1-10 sealing methacolate?? good others have to repeat-reapply- on a schedule ADT
- eliminate joints reaction to live loads and deterioration driving maintenance decisions
- BMS-when to first apply when to reapply on an existing structure-number of years would you spend money what is break point
- chlorides delaminations if deck ok then epoxy overlay
- concrete restorative material for preservation

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Are there regional or bridge type or environmental standards that can be applied across a number of states?
- Is there a lifecycle time line that can be identified or developed regionally?

Group number: Table #5

Discussion topic: Decks, joints,

Discussion Highlights (note main discussion items)

TYPES OF JOINTS

Types Deck seals

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

Deck seals proper prep work to structure . cost of sealent

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

Compression joints, Silicone joints, Rubber seals, Strip seals.

Modular joints

Polymer overlay 10 - 15

Methacrylate seal 1- 10 years

Silane seal 1 to 5 years

Mod Latex overlay 20 - 25 years.

Hydro demo

More research on life expediency

Group number: Table 6

Discussion topic: Deck Preservation

Discussion Highlights (note main discussion items)

- Deck Joints
- Decks
- Specifications

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- Life of joint - Lack of preparation - stay with what works -Examine movement - Surface preparation
- Decks - Specifications to evaluate problems - Concrete overlays - Working on specification of preservation
- Specifications - Wide variety of specifications Between owners

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- More standardized specification on deck preservation
- More accurate data from field
- Comparison - consolidate of preservation specification
- Training for contractors and construction inspectorsand state maintenance in proper instulation - resolve problem happening early in bridge life

Group number: 7

Discussion topic: Deck Preservation
Techniques & Strategies

Discussion Highlights (note main discussion items)

Deck Joints

Deck Seals

Deck Overlays (Asphalt)

Deck Crack Sealing

Deck Cleaning

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- Silicone sealer works well for joints.
- Uses spec sealer on decks.
- Hydro Blasting reseal deck.
- Try not to place asphalt overlays on bridge decks.
- Clean deck some times. Mainly sweeping off only.

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

Need more technical on finding bad spots before Hydro Blasting.

Asphalt overlays wrecks concrete decks need more info on sealing deck before overlay.

Need self cleaning deck joints??

Need new ways of doing things instead of the same old way it has always been done.

Group number: Table 8

Discussion topic: Deck Joints and deck sealers, asphalt overlay. Epoxy overlay

Discussion Highlights (note main discussion items)

- Silicone joints used the most in all states.
- Plug joints
- Ways and means to seal decks that will last long periods.
- Asphalt overlay is not good to deck, causes deterioration of concrete.
- Epoxy overlays

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- A means for an Advance protection to beams before joints are installed.
- Seal decks after the grooving has been done
- Getway from doing asphalt overlays.
- Latex overlays / thickness 1/2" to 2"
- Epoxy overlay use on steel grid deck for protection and non-skid.

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Possible find ways or means of reducing the number of doing away with joints
- Needs to start back sealing the decks for protection / longer life
- Non-destruction test for bridge decks.

Group number: 9

Discussion topic: Deck Preservation

Discussion Highlights (note main discussion items)

- Problems - Seals and joints- not staying sealed, delaying traffic to repair, red tape challenge from start to finish, time constraints because of Gov. politics,
- Low bidder always not the best contractor for the job. Inferior materials and procedures.
- State can choose higher bid.
- Specify in contract what is needed, material, cost of install, life of product-
- QPL list - time to research list, less people in DOT to do this.
- Environmental differences for different product materials.
- DOT Design and maintenance working together for preservation.

Deck joints

Lack of longevity

Install issues

Deck seals

Lack of longevity

Install issues

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- Specifications
 - Performance based specs.
 - Proof of performance
 - Field testing to lab testing

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

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Discussion Highlights (note main discussion items)

- Construct decks free of cracks- ACI 308R monograph (pouring and curing guidelines)
- Evaluate and characterize cracks according to size, pattern, origin, region, environment
- Implement Repairs - Epoxy injection, Methacrylate/sealer,

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- Identify deck deterioration
 - 1) Chain Drag - (delamination)
 - 2) Observe deficiencies - Spalls, pot holes, Delamination
 - 3) Cores - % Chloride contamination, Depth of chloride contamination.
- Best Practice Repairs
 - 1) Patches - (fast setting repair mortar)
 - 2) Protecting/Preserving
 - a) Asphalt overlay over membrane- (protection)
 - b) LMC/PMC
 - c) thin polymer (broadcast) overlay

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Selection criteria
 - 1) Cost vs Life cycle
 - 2) Overall condition
 - 3) Life exp.
- Action Item
 - 1) Evaluate State to State for material, procedure, performance according to environment
 - 2) Share Info - State to State
 - 3) Recommendation to research based on state to state gathering

Group number: 11

Discussion topic: Bridge Deck Preservation

Discussion Highlights (note main discussion items)

- Elastomeric Headers
- Concrete Headers with strip seals
- Finger Joints
- Overlays on bridge decks

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- Replacing steel headers with elastomeric headers due to costs and durability.
- Maintenance issues with cleaning out troughs of finger joints.
- Bridge deck evaluations before overlay.

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Need maintenance plans to include cleaning out troughs but most states do not any schedule to clean these until there is a problem.
- One state would like to have a federally mandated preservation program. Has a very good inspection program but not maintenance.
- Evaluate the effectiveness of different sealers.
- Case studies sharing between states.
- Protecting membrane during phase construction.

Group number: 12

Discussion topic: Deck Preservation

Discussion Highlights (note main discussion items)

- Deck joints, overlays and sealers

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- Jenie joints work well
- Evazote joints work well

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- Performance based spec
- Manuf on site during insulation
- Warranties
- Corrosion Inhib - Spray applied
- Training - Chemistry for non chemical engineers

Group number: 13

Discussion topic: Deck / Joint Preservation

Discussion Highlights (note main discussion items)

- **Bridge design from the onset**
- **Deck and joints**
- **Working on deck preservation, can the joint be eliminated**
- **Stainless steel finger joints**
- **Appearance of the deck when preservation may be needed**
- **At what point has a joint failed (how define failure)**
- **Routine life of different joints**
- **0-10 year deck rehab**
- **Lack of data for materials used during construction**
- **Thumb rule for how much money should be spent on Preservation**

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- **Elimination of all joints when possible**
- **High performance concrete decks from the start, 0-10 year no rehab needed**
- **All stainless steel rebar for the deck during construction**
- **Visual inspections of joints**
- **Templates for contracts / All contracts use same language**
- **Demonstration of materials from contractors, on site**
- **When to use stainless steel bar versus normal bar considering bridge location and size**

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- **Promote Best Practices - Product Company - Contractor warranty - QA - All inclusive joint performance.**
- **Promote Best Practices - Promote High performance concrete and reinforcing decks - Elimination of all joints from the start**
- **Publication on performance of joint life, deck repair, deck overlay, "Bridge Preservation Publication"**

Discussion Highlights (note main discussion items)

- What types of issues are we seeing?
- Joints pulling apart improper installation? (training, inspection,maintenance)?
- Scupper/Drainage problems (Debris Trash Blockage)
- Overlay of decks Cracking of decks,Hydro Demo repair, Sealants
- How long did the joints last? No documentation of replacement
- Sealing rebar during repairs
- Hydroblasting water causing reaction deterioration
- Deck sealing (thin epoxy, membrane, skid resistance, age, not enough cover, 24 hr concrete mix, vibration issues,membrane holding moisture,gutter line going first.
- Old joint leaking on bearings; troff system rotting out Causing damage.
- Effects of hydrodemolition; compatability study; water /salt seeping to bottom steel; Effects of PH between repair material.
- Repair materials being compatable. Is material from new patch to old concrete.
- Improper preparation of material during patch repair.

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

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Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

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Group number: Table 15

Discussion topic: Deck

Discussion Highlights (note main discussion items)

- **Formal Interaction with Design and Maintenance**
- **Design with ease of maintenance**
- **Consider open joints**

Notable Practices (Note practices, strategies, policies, products, etc that are working well)

- **Good design guidance with coordination of the design and maintenance depts.**

Action Items (Note recommendations for research, leadership, communication, facilitation, technical assistance, etc)

- **Improved Formal Interaction with Design and Maintenance**
- **Improved trough design under finger joints**
- **Access to clean/maintain troughs**
- **Developed maintenance details - eg: Header repairs should extend down to the reinforcement**