BRIDGE DECK HYDRODEMOLITION WITH RAPID-SETTING CONCRETE OVERLAYS

* Experiences with Hydro in Missouri
* Types of Rapid-Setting Overlays
* Contractor Applied Overlays
* Overlays Applied by State Forces
Experiences with Hydrodemolition in Missouri

- Total Surface Treatment
- Started out as maintenance demo’s (1996)
- 1st Project: Contracted 5 Bridges – St. Louis area (2001)
- Latex Modified Overlay
- Silica Fume Overlay
- Rapid-Setting Overlays
TYPES OF RAPID-SETTING OVERLAYS

- Rapid-Setting Latex Concrete (RSLC)
- Low P Concrete
Where and When to Use:

- High traffic areas
- Weekend lane closures
- Accelerated Construction
- 4000 psi in 4 hours
- First project let in 2004
TYPES OF RAPID-SETTING OVERLAYS

- **LOW P CONCRETE**
- Introduced in Missouri in 2008
- Calcium Sulfoaluminate Cement
- Low Permeability, Low Shrinkage
- Blended cement with corrosion inhibitors
- Superplasticizers
TYPES OF RAPID-SETTING OVERLAYS
Comparisons of Low P and RSLC

- Cracking
- High Early Strength
- Low P costs less
CONTRACTOR APPLIED OVERLAYS

• **RSLC Installations in Missouri**
  • First installation: IS 270 over Ladue Road – 2004
  • Approximately 15 bridge overlays to date
  • Higher profile areas include:
    * IS 270 / Ladue Road (St. Louis) - 2004
    * IS 70 EB / 5th Street (St. Charles) - 2004
    * Poplar Street Approach (Eastbound) - 2005
    * Poplar Street Approach (Westbound) – 2006
  • **ALL LOCATIONS PERFORMING VERY WELL**
Hydrodemolition/rapid set latex (8/05).
A1501 W  St. Louis City IS 64  8-31-10
Wearing surface in series 21.
Random transverse cracking in overlay (series 21).
Low P Installations

* Approximately 15 bridges in St. Louis Area
* All less than 2 years old
* Highest Profile location IS 44 (Eureka, MO)
IS 44 WB over Meramec River
Eureka, MO

Hydro w/ Low P
OVERLAYS APPLIED BY STATE FORCES

- Mini-Bridge Deck Rehabs
- Bridge Work A-la-carte
- State Provided Labor
- Equipment Rental
- Request for Quotation for Services
OVERLAYS APPLIED BY STATE FORCES

• Approximately 15 done internally since 1996
• Most on lesser volume routes
• Various overlay types installed
• Bridges that miss program
OVERLAYS APPLIED BY STATE FORCES
(State Provided Labor)

- Traffic Control
- Milling - Trucks / Sweeper
- Hydrodemolition - Containment
- Deck Preparation / Finishing
- Concrete Curing
- Paving Depth Transitions
OVERLAYS APPLIED BY STATE FORCES
(Equipment Rental)

Options include:

• Milling (with or without operator)
• Hydrodemolition Equipment with Operators (water optional)
• Finish Machine with Operator
• Mobil Mixer Rental with Operator
OVERLAYS APPLIED BY STATE FORCES
(Request for Quotation for Service)

• Overlay Placement by Contractor (Varies)
• Approach tie-ins
OVERLAYS APPLIED BY STATE FORCES
First Project in Missouri

- St. Mary’s Road / IS 44 – Franklin Co (196)
- Experimental Overlay – Still in service today
- Moderate deterioration
L0888
Burlap and plastic curing
for Silica Fume Overlay
Overlay Poured by Bridge Crew
6-8-2007
OVERLAYS APPLIED BY STATE FORCES
(Advantages)

• Control Cost
• Sense of Ownership in Job
• Rapid Construction
• In-line with Department Values
OVELAYS APPLIED BY STATE FORCES (Rapid-Set Low P Concrete)

• First Installation in October 2008
• Demo with Maintenance Forces
• Hydroblasted and resurfaced Bridge deck
• Entire Process took less than 24 hours to re-open bridge
Low P Concrete Pour
First in Missouri
Low P Concrete Overlay
Route 3, Macon County
CONCLUSIONS

* Very good success with hydrodemolition and Rapid-Setting Overlays

* Both RSLC and Low P Concrete have worked well

* State Applied Overlays supplement Contract work and help fill gaps