



Accelerated, Effective, and Reliable Construction Practices Consistent with Long Service Life

January 11, 2009

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*A partnership of the Virginia Department of Transportation
and the University of Virginia since 1948*

Long Service Life depends on the design, materials (quality concrete, corrosion resistant steel), and construction practices for a given environment



Unexpected Events



03/05/2009

Unexpected Events



Outline

- **Design Details**
- **Transporting**
- **Placement**
- **Finishing**
- **Curing**

Design Details – Construction related issues

Poor design details:

- **Shy cover**
- **Leaking joints**

Poor construction practices

- **Shy cover**
- **Leaking joints**
- **Form dimensions (tolerances)**
- **Amount and location of steel**
- **Drainage**

Design - Shy Cover



Design – Leaking Joints



Design - Leaking joints



Construction - Shy Cover



Construction related:

- Placement of steel
- Adjustment of screed

Construction - Drainage

- **Keep the drainage layer clean.**
- **Provide proper slope for drainage.**

Transporting - Pumping



Pumping

- **Loss of air**
- **Loss of slump**



Handling - Difficulty in Finishing



Consolidation



Consolidation



Self-Consolidating Concrete (SCC)



SCC Arch Bridge – 2001

- First SCC application
- Arch length of 45 ft



- 5,000 psi
- 2500 coulombs



Conventional Concrete



Arch Bridge - SCC



Rte 33 Bridge over Pamunkey River



SCC Concerns

Uniformity

Loss of stability, segregation

Air-void system

Increased shrinkage

Formwork pressure and tightness

Delivery



I-95 over James River, VA

Precast composite units: 2 units per span,
each unit LWHPC over 3 steel plate girders



Polymer closure joint between units with
minimal prestressing eliminated 2/3rd of joints

Coleman Bridge, VA



Finishing - Screeding



Not So!



Curing

- **Quality material: burlap, curing compound meeting specifications**
- **Applied on time**
- **Proper application, enough coverage**

Curing



Curing



Not So!



Cracking Under the Deck



Route 40



Conclusion

**Proper construction practices
are essential for longevity.**



THANK YOU

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