SHRP 2 - R04 Innovative Bridge Designs for Rapid Renewal

AASHTO SCOBS General Session
SHRP2 R-04
Accelerated Bridge Construction

Norfolk Virginia
19-May-2011
DEMONSTRATION PROJECTS – UPDATE
IMPLEMENTATION PHASE
SHRP 2 Rapid Renewal

- Construction subsidy
- Design subsidy
OUTREACH -

- Canvas AASHTO Regions 1, 2, 4, and 5
- Objectives specified
- Responses
OBJECTIVES (Ideal)

- Concrete bridge
- Slide-in, launch (or gantry construction)
- Not SPMT
- Seismic zone
- High volume (over and under)
- Weekend closure (Tier 1 – 48 to 60 hours)
- Not AASHTO Region 3
RESPONSES

New York
Michigan

New York Bridge Authority
North Carolina
Texas

Virginia
Massachusetts
California
SHORT LISTED -

New York State
Department of Transportation
I-84 over DINGLE RIDGE ROAD
REGION 8
Poughkeepsie
DEMONSTRATION PROJECT – 1

US 6 over Keg Creek
IOWA DOT
US 6 over Keg Creek
KEG CREEK BRIDGE – Iowa
Finished Bridge
IOWA DEMONSTRATION PROJECT
Keg Creek Bridge

- Engineer’s estimate $2.1 million
- Seven (7) bidders
- Low bid $2.6 million
- Contract awarded in March
- Under construction
- Self Performing Modular Units
TIER 2 Project
(Two week closure period)

- Redesigned as an ABC system
- Reduced bridge closure from 6 months to 2 weeks
Larger Footprint for New bridge
Stage 1 work (prior to bridge closure)

- Construct drilled shafts to ground level
- Construct wing walls on piles
Stage 2 work (14-day closure)
Tier 2 Project

- Close bridge/enact detour
- Demolish existing bridge
- Assemble precast columns / capbeams
- Assemble semi-integral abutments
Stage 3 work (14-day closure)

- Assemble modular superstructure including precast approach
- Cast UHPC closure joints and grind deck
- Re-open bridge to traffic – end ABC period
SITE VISIT – Workshop

September 19, 2011 (To be confirmed)

- All are invited
- Travel assistance
DEMONSTRATION PROJECT – 2

Interstate 84 over Dingle Ridge Road
NYSDOT

Kickoff Meeting
I-84 over Dingle Ridge Road
OVERVIEW Dingle Ridge Road

- I-84 ADT 100,000+
- $1.5 million in temporary works (current plan)
- Prototype – multiple locations
- Letting 3rd quarter 2012, or earlier
DINGLE RIDGE ROAD – New York
SITE PLAN

Dingle Ridge Road
PROPOSED SINGLE SPAN BRIDGE
Slide-in
SUPERSTRUCTURE OPTIONS

NEXT D
DELIVERABLES

Tool Kit

- Design Examples
- Standard Plans
- Sample Specifications
- Training Materials
SHRP 2 R-04
ABC Technologies for Design and Construction

OBJECTIVE – Widespread application
Phase 3 Deliverables

**DESIGN STANDARDS**

- **Precast Modular Abutment Systems**
  - Integral abutments
  - Precast wingwalls
  - Precast approach slabs

- **Precast Complete Pier Systems**
  - Straddle bents
  - Conventional bents

- **Modular Superstructure Systems**
  - Concrete deck bulb tees
  - Concrete double tees
  - Decked steel stringer system
ABC Standards for Superstructure and Substructure Systems

Pre-engineered Designs for

- 40 ft to 70 ft spans
- 70 ft to 100 ft spans
- 100 ft to 130 ft spans
- Simple / continuous

Training tools to increase familiarity about ABC among engineers.
CONSTRUCTION STANDARDS

- **Equipment options**
  - Erection Using Cranes
  - Above Deck Driven Carriers
  - Launched Temporary Truss Bridge

- **Erection options**

- **Movement technologies**
CONCLUSIONS

- Two demonstration projects
- Different technologies
- Durable connections
- Striving for economy
- Incremental innovation

The time for ABC is now!