ACCELERATED BRIDGE CONSTRUCTION (ABC)
LOUISIANA

By: Mark Bucci, P.E.
LADOTD Bridge Design
Our Experience with ABC

• Prefabricated Elements

• Prefabricated Systems

• Accelerated Construction Methods

• Proposed Project using ABC
Prefabricated Elements

• Mostly a Concrete State

• Precast Prestressed Concrete Girders & Piling
  • Used extensively
  • Several producers around the State
  • Competitive pricing
Prefabricated Elements

• Precast Reinforced Concrete Decks
  • Limited use
  • Typically reserved for time critical projects

• Precast Reinforced Concrete Bents
  • Limited use
  • Lends itself well to repetitive type construction
Prefabricated Elements

- Precast Concrete Elements
  - Girders
Prefabricated Elements

• Precast Concrete Elements
  • Girders
  • Piling
Prefabricated Elements

• Precast Concrete Elements
  • Girders
  • Piling
Prefabricated Elements

• Precast Concrete Elements
  • Girders
  • Piling
  • Decks
Prefabricated Elements

• Precast Concrete Elements
  • Girders
  • Piling
  • Decks
Prefabricalted Elements

• Precast Concrete Elements
  • Girders
  • Piling
  • Decks
  • Bents
Our Experience with ABC

• Prefabricated Elements

• Prefabricated Systems

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Prefabricalted Systems

*Prefabricated Spans*
  *Limited use*
  *New Construction*
    *Large projects with repetitive construction*
    *Typically reserved for time critical projects*
*Repairs*
  *Span replacement*
Prefabricated Systems

• New Construction – Large Projects
Prefabricated Systems

• Span Replacement - Repairs
Prefabricated Systems

• Span Replacement - Repairs
Our Experience with ABC

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Accelerated Construction Methods

• Structural Placement Methods
  • Typically reserved for time critical projects
  • Set maximum closure period in plans
  • Suggest method to establish feasibility

• Construction Method
  • Geosynthetic Reinforced Soil Integrated Bridge System (GRS-IBS)
Accelerated Construction Methods

• Structural Placement Methods
  • Crane
Accelerated Construction Methods

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  • Crane
Accelerated Construction Methods

• Structural Placement Methods
  • Crane
  • SPMT
Accelerated Construction Methods

• Structural Placement Methods
  • Crane
  • SPMT
Accelerated Construction Methods

• Structural Placement Methods
  • Crane
  • SPMT
Accelerated Construction Methods

• Construction Methods
  • GRS-IBS
PROPOSED PROJECT

US 165 BRIDGES NEAR FENTON
PRECAST SLAB SPAN BRIDGE

By: Andrew Michael, P.E.
LADOTD Bridge Design
Project Information

• Current letting: 12/09/2015
• Pilot project to develop Precast Slab Span Bridge Special Details
• Plans expedited to meet federal authorization deadline
Site Information

• Site Location

Fenton, Louisiana
Site Information

• Site Location

4 Bridges:
- 3 Precast Slab Spans
- 1 Quad Beam Bridge Span
General Design Requirements

• Live load
  • Louisiana Design Vehicle Live Load (LADV-11)

• Precast members minimum strength
  • Cap, Span and approach slab members: $f'c = 6000 \text{ psi}$
  • Piles: $f'c = 4500 \text{ psi}$

• Precast member fabrication tolerances
  • Unit Depth $\pm 3/16 \text{ inch}$
  • Unit Length $+1/8 \text{ inch}$ and $-1/2 \text{ inch}$
  • Overall span width $\pm 1/8 \text{ inch}$
  • Riser flatness $\pm 1/8 \text{ inch}$ per 10 ft
Substructure Construction Sequence
Pile and Cap Section
Cap Closure Placement
Superstructure Construction Sequence
Precast Panel Details
Superstructure Construction Sequence

Install Formwork
Superstructure Construction Sequence

Cast-in-Place Closure Placements
Precast Approach Slab Requirements

- Designed as simple span units
- Sleeper slabs
- Geosynthetic reinforcement underlayment
- Eliminate approach slab to roadway skew
Approach Slab Typical Section
Approach Slab Plan View