Spliced Concrete Girder Projects

Continuous Spans

- Bow River Bridge, AB
- Main St. Viaduct, Pueblo, CO
- Rosebank-Patiki Interchange, NZ
- Palm Valley Bridge, FL
- Moore Haven Bridge, FL
- Route 33 Bridges, West Point, VA
Continuous Span Projects

Bow River Bridge, AB

- Built in 2002
- 4 spans: 2 at 174 ft, 2 at 213 ft
- One segment per span
- 211 ft beams weighed 268,000 lb.
- Beams 9.2 ft deep with 6.9 in. web
- 11.65 ft beam spacing
- Very high live load requirements
- Concrete saved 10% over steel girders
Longest known single piece girders shipped by truck at 211 ft long
Continuous Span Projects

Main Street Viaduct, Pueblo, CO

- Built in 1995
- 734 ft spliced girder structure
- 5 spans with 174 ft max. span
- 7 segments with 154 ft max.
- 72 in. deep girder haunched to 96 in. over 2 piers
- End block section used over 1 pier
Continuous Span Projects

Main Street Viaduct, Pueblo, CO

- Erected on falsework & strongbacks
- Spliced to achieve greater spans with restricted pier placement
- Very tight schedule and budget
- Aesthetics, durability and low maintenance costs were considered
- 8 Girders spaced at 10'-6"
- Overall deck width = 80'-0"
Main Street Viaduct, Pueblo, CO
Main Street Viaduct, Pueblo, CO

Constant depth Web and thickened Bottom Flange
Main Street Viaduct, Pueblo, CO

Strongbacks at splices instead of towers
Main Street Viaduct, Pueblo, CO
Continuous Span Projects

Rosebank-Patiki Interchange, NZ

• Built in 1997
• 2 - 435 ft spliced girder structures
• Curved ramps with 492 ft radius
• 4 spans with 138 ft max. span
• 6 segments with 2 pier segments
• 71 in. deep girders
• Integral cap to provide continuity between sub- and superstructure
Rosebank-Patiki Interchange, NZ

Spliced Unit

Pier Segments

Splice at Pier
Rosebank-Patiki Interchange, NZ

Integral Cap

Strongback
Continuous Span Projects

Palm Valley Bridge, FL

- Built in 2002
- 3 spans (210' – 290' – 210' = 710')
- 5 segments in each girder line
- Designed as spliced girder by consultant
- Barge delivery of segments
- Erected on falsework
- Full-length post-tensioned
Palm Valley Bridge, FL

Haunched pier segment:
- Special forms & bed for 15' depth
- 8" web for 3" diam. PT ducts

Strut for pretensioned strands in top flange
Palm Valley Bridge, FL

• Haunched pier segment
  - Variable web depth to 15’ total depth at pier
  - Bottom flange depth varies slightly

ACEC/NCDOT Spliced Girder Workshop
Palm Valley Bridge, FL

- **Pier segments:** 15' deep, 141' long, 125 tons
- **End segments:** 81" deep, 139' long, 100 tons
- **Drop-in segment:** 96" deep, 148' long, 103 tons
- **1'-0" field closure pour between all segments**
To maintain unobstructed channel
• Temporary towers in back spans
• Strong-backs at splices between segments
Continuous Span Projects

Moore Haven Bridge, FL

- Built in 2000
- 3 spans with 320 ft max. (RECORD)
- 5 segments with 15 ft deep haunched pier segments
- Barge delivery of segments
- Erected on falsework
- Spliced girder selected by contractor
Moore Haven Bridge, FL

3 span unit

320’
Continuous Span Projects

Route 33 Bridges, West Point, VA

- 2 bridges: Mattaponi and Pamunkey Rivers
- Currently under construction
- Each bridge has two 4-span units with 200'-240'-240'-200' spans
- 8 ft deep girders haunched to 10'-6'' deep at piers
- Barge delivery of segments
- Erected on falsework supported by footings
Route 33 Bridges at West Point, VA

Seven segments to form the 4 spans
Girders and decks are lightweight concrete
Route 33 Bridges at West Point, VA

Lightweight concrete bulb tee girders
- $f'_c = 8,000$ psi with max. density of 125 pcf

Lightweight concrete deck
- $f'_c = 5,000$ psi with max. density of 120 pcf

Lightweight concrete was used to reduce foundation loads
- Estimated 10% reduction in piles for main piers
- Also reduced foundation size

VTRC performing material tests and observing construction
NCHRP Project 12-57
Extending Span Ranges of Precast Prestressed Concrete Girders

NCHRP Report 517 completed October 2003


Selected results of research
- List of Spliced Girder Bridges
- Design Examples
- Proposed revisions to Specs
Initial Findings

Most design options for extending span ranges involve incremental changes to current design methods and materials

- Design options need to be identified
- Additional design guidance not required

Spliced girders provide significantly increased span ranges for precast prestressed concrete girders

- Information is lacking
- Focus of most of the activity in the study