

Chronological History of Missouri Bridge Design

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Missouri (TEAM)

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By

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Missouri Statistics

✓ Data from Meet MoDOT (January 2018)

- <http://www.modot.org/about/documents/MeetMoDOT.pdf>

✓ 33,856 Miles of roadway

- 5,517 Major routes
- 28,339 Minor routes

✓ 10,403 Bridges

- 53 Major river bridges



Purpose of Discussion

- ✓ Chronological History of Factors Influencing MoDOT Bridge Design
 - Updated (almost) yearly
- ✓ Bridges with Innovations List
 - Innovative or interesting bridges
 - Not or no longer tied to a specific research project



Chronological Listing of Factors

- ✓ List of factors that are changes in our design policy
- ✓ Related to AASHTO and MoDOT changes
- ✓ Unknown when started but information dates back to 1960



Chronological Listing of Factors

✓ 19

• F

✓ 19

• F

• F

✓ 19

• F



ges



Chronological Listing of Factors

✓ 1973

- 2-span with semi-deep abutment over freeways
- Epoxy coated top layer in deck

✓ 1980

- Precast, prestressed deck panel option

✓ 1983

- All bridges designed for HS20 loading



Chronological Listing of Factors

✓ 1986

- Vent holes in girders over streams
- All slab bars epoxy coated

✓ 1989

- Scour design (Schoharie Creek 1987, Hatchie River 1989)

✓ 1990

- Seismic design



Chronological Listing of Factors

✓ 1991

- Deflection limit from $L/1200$ to $L/1000$ steel

✓ 1996

- Metric design

✓ 2001

- First use of high performance steel



A6101 & A6102 First HPS Use

- ✓ Two bridges using HPS70W in the flanges at intermediate supports
- ✓ A6101 Used HPS in tension flange of positive moment region
- ✓ A6101 Used AASHTO deflection limit
- ✓ A6102 Used more restrictive deflection limit



A6101 & A6102 First HPS Use

A6102 01-26-11
US 24 Lafayette Co
North profile



Chronological Listing of Factors

✓ 2004

- Precast, post tensioned full depth panels
- Nemo Bridge

✓ 2004

- Practical design

A08941 Nemo Bridge

- ✓ 1683' Long bridge redecked 50' each night
- ✓ Precast full width deck panels
- ✓ Opened to traffic each morning



A08941 Nemo Bridge

A0849
TOP VIEW LO



A0894 11-26-12
SW SIDE VIEW LOOKING E



Chronological Listing of Factors

✓ 2005

- Precast bent caps
- A6941 – Route T – Franklin County

✓ 2007

- First prestressed NU girders
- A7382 – Route 61 – Ralls County

A6941 Precast Beam Caps



105



A6941 Precast Beam Caps



A6941
Northeast to South
1-11-2007

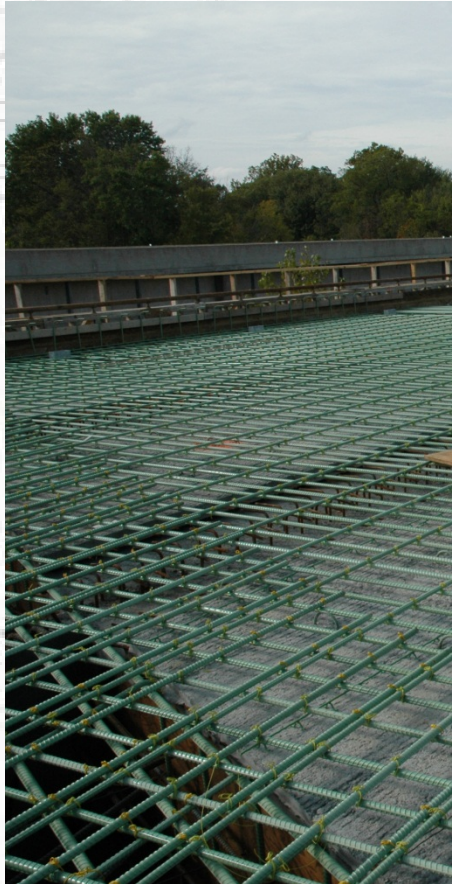


A7382 First NU Girders

- ✓ (67'-69'-115'-69'-67') PSNU-43 girders
- ✓ Had construction issue with 3 drilled shafts

A7382 First NU Girders

A7382 Ralls US 61
1-15-08 West side



Chronological Listing of Factors

✓ 2007

- First use of CFRP and GFRP rebar in redeck
- N00381 – Route Y – Boone County
- N08861 – Route OO – Miller County

✓ 2008

- Buried precast three sided structures
- A7534 & A7535 – Route 67 – St. Francois County

N00381 FRP Rebar in Deck



N00381 FRP Rebar in Deck



Precast Concrete Arches

- ✓ A7534 & A7535 Regular and waterproof joints



A7534 & A7535 Arches



Chronological Listing of Factors



A7
Un



Chronological Listing of Factors



Chronological Listing of Factors

✓ 2011

- First use of galvanized H-piles
- A7967 – Route PP – Butler County

✓ 2017

- First use of super workable fiber reinforced concrete for deck
- A8509 – Route J – Cole County

A8509 Cole County



Chronological Listing of Factors

✓ 2018 & 2019

- Use of MMFX/ChromX in redeck, new bridge and twin structures
- R0435, A8565 and twins A8720/A8721
- Higher strength steel reinforcing

Conclusion

- ✓ MoDOT is constantly trying new things
- ✓ MoDOT keeps track of this with a Bridges with Innovation list



Any Questions???

Thank You

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