



Plate Girders and Rolled Beams Steel Bridge Solutions

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DeLong's, Inc.



WHEN IS STEEL PREFERRED TO CONCRETE?

Roadways





WHEN IS STEEL PREFERRED TO CONCRETE?

- Roadways
- Stream Crossings





WHEN IS STEEL PREFERRED TO CONCRETE?

Roadways

Stream Crossings

Railroads





WHEN IS STEEL PREFERRED TO CONCRETE?

Roadways

Stream Crossings

Railroads

Pedestrian Bridges



Design-Build Projects

Bootheel Project in Southwest Missouri

- Needed to repair or replace the superstructure of 15+ bridges
- The winning team used concrete
 - Was concrete the best choice for all 15 bridge? **Doesn't seem likely.**
 - The winning team chose concrete because of familiarity, time, and cost.
- **There are other examples where concrete beats steel, but still hard to draw conclusions.**
 - **Such as: a 100' span in Northern MO where none of the bidders chose steel. Multiple structures in the same project. All were concrete except the one alternate bid. What would you do if you were the concrete supplier?**

Design-Build Project Wins

2021 I-270 re-build in North St. Louis County

- Steel was chosen for 4 of 21 structures on this project
- The pricing was so close that paint turned out to be the deciding factor
 - Where uncoated steel could be used, steel was chosen. But, in areas where uncoated steel was not allowed, concrete was chosen.
 - Still not sure why the owner prohibited steel in many of the locations...



Design-Build Project Wins

- The I-44 SW MO Project was favorable for steel
 - Steel was chosen for 12 of the 23 structures in this design-build project
 - The design team evaluated costs individually for each structure
 - Weathering steel was generally used over water, if there was enough clearance to keep the steel out of the flood plain
 - Painted steel was used over roads
 - Contractor was okay with some paint being field applied over low traffic roads but over interstate we used a 3-coat shop applied system







Design-Build Project Wins

- Steel has been used on major river crossing design build projects in Missouri, including the Buck O'Neil Bridge in KC and the Rocheport Bridge just west of Columbia, MO

Design-Build Project Wins

- Our biggest winner, percentage-wise, among bundled projects in MO, was the FARM Project (Fixing Access to Rural Missouri)
 - The owner wanted to repair or replace as many as 35 bridges across Northern MO
 - The winning team was able to replace 31 bridges for the fixed price that was set by the owner.
 - One concrete beam bridge was built, 3 box culverts, and 27 rolled beam bridges
 - All 27 were over small creeks and streams: 1 was single span and all the others were 3-span simple for dead load continuous for live load designs
 - Center spans were 10-30% longer than end spans
 - No center span exceeded 100'
 - The scoring process rewarded durability and longevity.
 - Galvanize beams were used for all steel structures

Summary and Recommendation

Category	Available Points	Team 1	Team 2	Team 3
Bridge Bundle Definition Part 1	40	39.7	38.3	40
Bridge Bundle Definition Part 2 (Bonus Points)	15	1.5	0	1.5
Bridge Quality and Longevity	30	18.7	20	21.7
Location Completion and Maintenance of Traffic	15	5.8	11.8	8.9
Total	100	65.7	70.1	72.1



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Medical Store



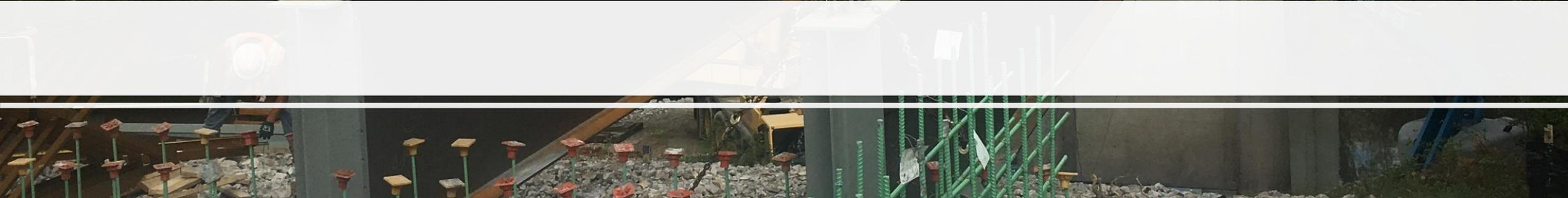
Alternate Bids

- There are a few examples of single bridges where the designer gave contractors 2 sets of plans and let the contractor bid the job using steel or concrete
 - In 2018, MODOT let a job over the Pomme de Terre River in Polk County
 - It was a 3 span continuous 110' – 140' – 110'
 - Bidders 1,3,4,5, and 6 chose steel
 - Bidder 2 chose concrete
 - Difference was less than 3% between the lowest two bids

POLK County G04

<https://modotweb.modot.mo.gov/BidLettingPlansRoom/Letting/Index/3987>

Company	Bid Amount
Emery Sapp & Sons, Inc.	\$1,422,957.00
Lehman Construction, LLC	\$1,461,812.40
Hartman and Company, Inc.	\$1,540,500.00
Phillips Hardy, Inc.	\$1,678,368.35
Capital Paving & Construction, LLC	\$1,846,602.66
Robertson Contractors, Inc.	\$1,921,897.00





More recent experiences

- Earlier this year MODOT let alternate bids on a small plate girder bridge in Cooper County, MO
- 8 bids were received
- Bidders 1 through 7 used steel, with only the last place bidder submitting a bid based on the concrete design
- Just a month or so ago, a county in the St. Louis metro area let an alternate bid project
- The steel design was uncoated weathering steel
- Bidders were required to submit two bids, one for the concrete design, and one for the steel
- 6 bids were received - bidders 1 and 4 used steel, the rest used concrete

Cooper County D04

<https://modotweb.modot.mo.gov/BidLettingPlansRoom/Letting/Index/5248>

Company	Bid Amount
Widel, Inc	\$764,119.69
E & C Bridge, LLC	\$931,187.10
Hardy Construction, LLC	\$1,041,708.80
Don Schnieders Excavating Company, Inc.	\$1,053,138.15
Mera Excavating, LLC	\$1,058,415.90
North Central Bridge, LLC	\$1,157,162.16
S & A Equipment & Builders, LLC	\$1,186,675.97
Capital Paving & Construction, LLC	\$1,193,281.75

Project: Little Indian Creek Road Bridge Replacement

Owner: Franklin County, MO

Bid Date: July 13, 2023

Bidder	Total Bid Steel Beam Bridge	Total Bid Prestressed Concrete Beam Bridge
JK Concrete and Hauling	\$494,630.01	\$526,565.27
KJU Construction	\$526,960.50	\$518,489.50
Joe's Bridge and Grading	\$571,301.15	\$568,448.15
Pace Construction	\$650,000.00	\$664,698.20
Raineri Construction	\$671,320.00	\$670,139.80
Gershenson Construction	\$760,748.50	\$759,570.00

Competitive Materials

- Steel and concrete are both competitive materials, certainly for short and medium span lengths
- Recent alternate bid and design build projects have shown that there is no one right answer for every situation
- Steel has a lot to offer. We have rolled beams for short spans, plate girders for longer span, boxes and trusses and other types of designs for really long spans
- Depending on project specifics steel can be left uncoated, or painted, metalized, or galvanized.
- In some cases, owners want a long-life span and other times owners are concerned with getting a low initial cost. Steel allows for both.

Thank You



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