MEMORANDUM

Missouri Department of Transportation
Design
District 10

TO: Kathy Harvey
State Design Engineer

Attention: Joe Jones

FROM: Andy Meyer
Transportation Project Manager

DATE: December 1, 2008

SUBJECT: 2009 Awards for Excellence in Practical Design
Submittal – J0S2163, Rte W, Scott County

Please find attached Dictrict 10's submittal of the above referenced project for consideration. The project addressed the need to replace a severely damaged bridge and re-open a rural route heavily utilized by agricultural traffic prior to the fall harvest.

Project History

The Southeast District experienced severe flooding in Spring 2008, resulting is significant damage to bridge structures across the district. Many of these structures were quickly repaired after the flooding through the cooperation of the headquarters and regional bridge maintenance groups.

Bridge P099 over Little River Drainage District Ditch 35 received a great deal of attention between March and April of 2008, including reinforced end bents and new back boards, but it became evident that attempts to stabilize the structure would not be successful. Previously spliced piling under the intermediate bents had failed at the splice due to lateral loading applied by an accumulation of drift during the flood, and the bridge would have to be closed to all traffic until it could be replaced.

Local officials, property owners, and farmers that depend on Route W for access to Oran and Route 77 strongly and effectively communicated their desire to see this bridge replaced as soon as reasonably possible. Farmers that utilized Route W were very specific in their communication that this road was essential to efficient planting and harvest. School administrators in Oran were also concerned about impacts to bus route when school began in the fall.

Project Schedule

In late April, in communication with the bridge division, we developed a schedule as follows to re-open the bridge prior to the fall harvest and start of school:

- PS&E submittal May 27,2008
- Letting June 20, 2008
- Award July 2, 2008
- Early NTP July 16, 2008
- Open to traffic August 30, 2008.

Project Scope

In order to deliver the project within the very aggressive schedule described above, the project scope needed to be practical and realistic in terms of what we were trying to accomplish. We could not acquire right of way. We could not relocate utilities. We could not relocate access to adjacent properties. All the parameters listed above required that the bridge itself be reconstructed at the same profile grade and with a length approximating existing.

During the scoping fieldcheck, the core team committed to the following:

- Replace bridge with a single span box-beam structure, approximating the profile and length of existing. This was made possible by eliminating the intermediate bents, improving the hydraulic efficiency of the channel. Little River Drainage District signed off on the project specifically because of this design feature. Area farmers who were aware of the connection between drift and the damage/closure were very supportive of this design feature.
- Eliminate all approach guardrail and crashworthy end sections to allow existing field entrances to remain in place. This reduced grading to backfilling the bridge and dressing the approaches for paving.
- Set bridge width at 28 feet and bolt a standard tube rail system to the outside of the exterior beam. This maximized the usable opening for agricultural traffic and simplified the bridge to 7 – 4 ft. pre-cast box beam units. While eliminating one beam and going to a width of 24 feet would match the existing roadway, the efficiency in moving the rail out an additional 2 feet and eliminating all approach work was actually the most cost effective option. A low profile railing or differing beam widths were evaluated but discarded due to the increased design time necessary to implement.
- Road closure with traffic control maintained by MoDOT maintenance forces. Because the road was already closed, district maintenance simply maintained the existing traffic control until project completion.

Project Cost

	Roadway	Bridge	Total	
Preliminary Estimate*	160,000	200,000	360,000	
Project Award	63,065	170,358	233,423	
Total Savings	96,935	29,642	**126,577**	**(35%)**

* The preliminary estimate was based on a cost for a similar sized project that required a reasonable level of approach work and possible profile grade adjustment.

Conclusion

The bridge was completed and open to traffic on August 20, 2008, 9 days ahead of schedule. Keith Simpson of A.E. Simpson Construction commented that we had done everything short of eliminating the deck to simplify the structure and make construction quick and easy. This bridge has been used by the Southeast District as an example of what we are capable of accomplishing with the safe and sound program: a timely and practical solution to a rural bridge replacement.

2009 APPLICATION FORM

(required for each entry)

Complete this section for (check one): **X Small Project** ☐**Large Project**

☐**Post-Design Solution** ☐**Off System Project**

Job No. J0S2163 **Route** W **County / LPA** Scott Co & Little River Drainage Dist.

Description (attach separate sheet if necessary) Emergency contract to construct Bridge A7670 to replace Bridge P099 over Drainage Ditch 35 on Route W west of Oran. Bridge P099 was severely damaged during Spring 2008 flooding and was closed to all traffic until a replacement could be constructed. Roadway and bridge plans were completed in three weeks. The extisting bridge was removed and the new bridge constructed in 6 weeks.

Project Leader Andy Meyer

Key Team Members (include key personnel irrespective of employer-nine individuals maximum)

Anousone Arounpradith SPM	Kieth Ferrel SHE	Brian Holt RE
Tom Farris SHD	Nathan Connor SCI	Joe Crader SGS
Stan Johnson AE	Jeff Wachter TPD	Mike Landers SDT

Project Budget:

Initial Cost / Estimate $ 360,000 **Final Cost / Award** $ 233,423

What would make this entry stand out from the rest of the entries when considering MoDOT's practical design philosophy? (In layman's terms - 200 words or fewer-attach separate sheet if necessary)

This is an example of carefully balancing the scope of the project with the desired timeline and resources available. This was an emergency replacement. We needed the bridge done and the road back open before the fall harvest. We needed to deliver an economical solution with the understanding that this project was not previously programmed and would need to be squeezed into the budget. We needed to produce plans and specifications within the few weeks available to make the award and construction possible prior to harvest. All these needs were met by taking a practical look at the site, matching existing hydraulic conditions, matching existing roadway geometrics, and simplifying the roadway and bridge design to the extent that beams could be quickly fabricated, the bridge quickly constructed, and the road re-opened. **When we discuss the goals of the Safe and Sound program with local officials, we use this bridge to illustrate the successful implementation of the program and the delivery of realistic practical solutions for rural bridge replacements.**

Send entries to: MoDOT Design Division, ATTN: Joe Jones
1320 Creek Trail Dr., Jefferson City, Missouri 65109

ALL ENTRIES MUST BE RECEIVED NO LATER THAN CLOSE OF BUSINESS ON DECEMBER 1, 2008

J0S2163 - Route W, Scott Co. – A7670 opened to traffic 8/18/2000

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

(56') PRECAST PRESTRESSED CONCRETE VOIDED SLAB BEAM SPAN

ROUTE	STATE	DISTRICT	SHEET NO.
W	MO	BR	1

JOB NO. J0S2163

CONTRACT ID.

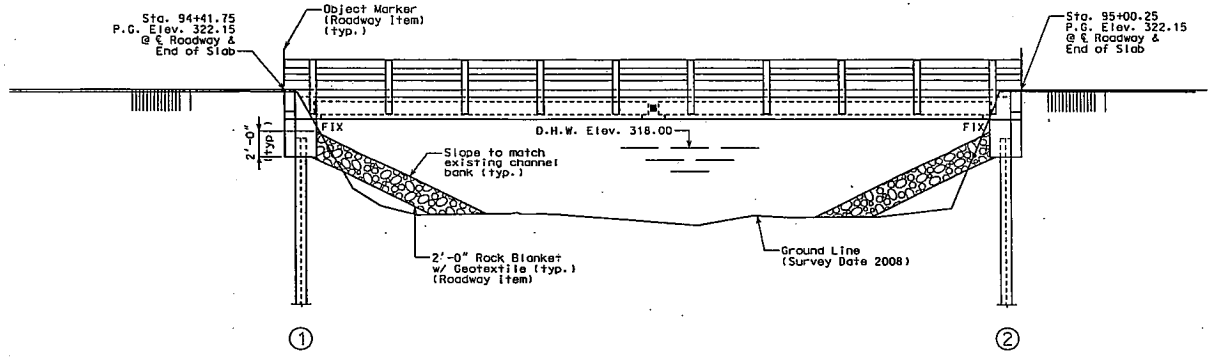
PROJECT NO.

COUNTY SCOTT

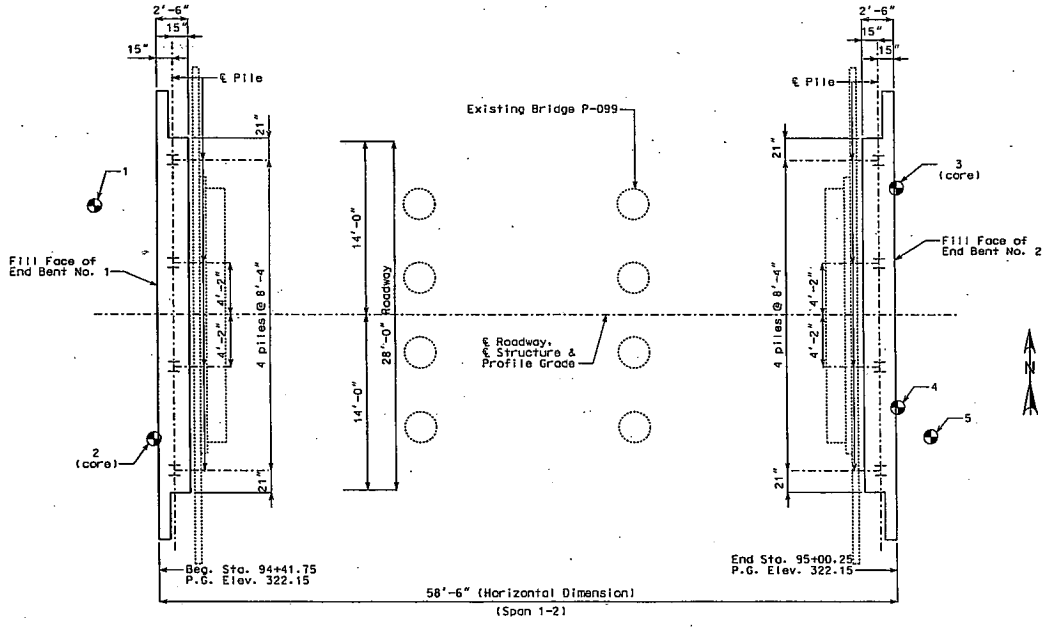
SEC/SUR 17 TWP 28N RGE 12E

STATE OF MISSOURI
ANOUSHEH ANSARINIA
NUMBER PE-2007
PROFESSIONAL ENGINEER
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



GENERAL ELEVATION



PLAN

"⊕" Indicates location of borings.

Notice and Disclaimer Regarding Boring Log Data

The locations of all subsurface borings for this structure are shown on the bridge plan sheet(s) for this structure. Boring data for the numbered locations is shown on Sheet No. 3. The boring data for all locations indicated, as well as any other boring logs or other factual records of subsurface data and investigations performed by the department for the design of the project, is available from the Project Contract upon written request as outlined in the Project Special Provisions. No greater significance or weight should be given to the boring data depicted on the plan sheets than is subsurface data available from the district or elsewhere.

The Commission does not represent or warrant that any such boring data accurately depicts the conditions to be encountered in constructing this project. A contractor assumes all risks it may encounter in basing its bid prices, time or schedule of performance on the boring data depicted here or those available from the district, or on any other documentation not expressly warranted, which the contractor may obtain from the Commission.

Notes:

Roadway fill shall be completed to the final roadway section and up to the elevation of the bottom of the concrete beam within the limits of the structure and for not less than 25 feet in back of the fill face of the end bents before any piles are driven for any bents falling within the embankment section.

For General Notes, Estimated Quantities, Pile Data & Location Sketch, see Sheet No. 2.

For Profile Grade information, see Sheet No. 11.

B.M. SE CORNER OF S WHEELGUARD BR# P0099
STA. 94+97.29 10.21' RT ELEV 322.60

BRIDGE OVER DRAINAGE DITCH NO. 35

STATE ROAD FROM RTE. P EAST TO ORAN

ABOUT 1.8 MILES EAST OF RTE. P

STA. 94+41.75

Designed May 2008
Detailed May 2008
Checked May 2008

Note: This drawing is not to scale. Follow dimensions.

STD. 706.35

A7670

REV.

ROUTE	STATE	DISTRICT	SHEET NO.
W	MO	BR	5

JOB NO. J0S2163

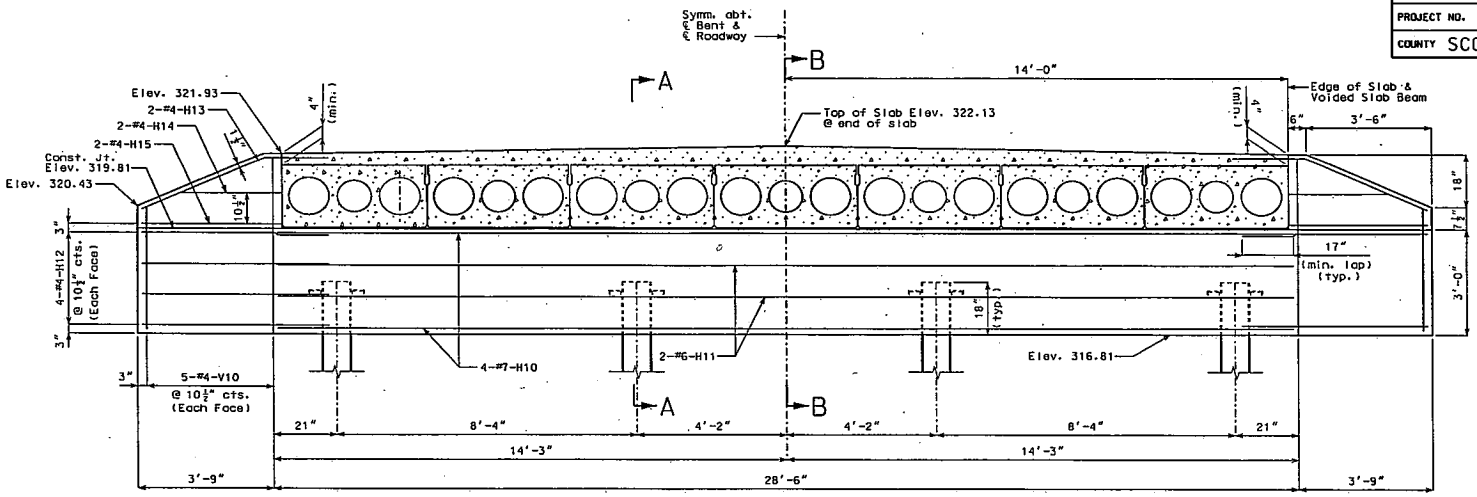
CONTRACT ID.

PROJECT NO.

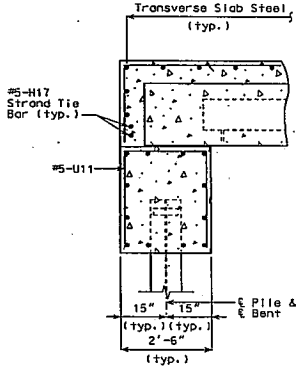
COUNTY SCOTT

STATE OF MISSOURI
ANGUSINE ARDLINGHORTH
NUMBER PE-2007
PROFESSIONAL ENGINEER
THIS SHEET WAS SIGNED, SEALED AND DATED ELECTRONICALLY.

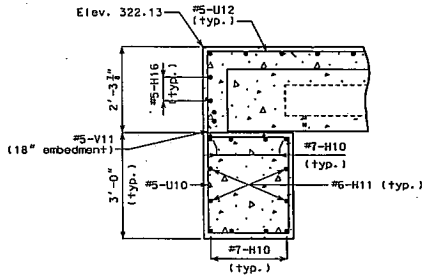
IF A SEAL IS PRESENT ON THIS SHEET IT HAS BEEN ELECTRONICALLY SEALED AND DATED.



SECTION NEAR END BENT



SECTION A-A



SECTION B-B

Notes:

All concrete in the end bent above a construction joint shall be Class B-2.

For details of end bents not shown, see Sheets No. 4 & 6.

All reinforcing bars shall be adjusted to clear piles by at least 1½″.

Slab reinforcement not shown for clarity.

For details of slab and reinforcement, see Sheet No. 12.

DETAILS OF END BENTS NO 1 & 2

Detailed May 2008
Checked May 2008

Note: This drawing is not to scale. Follow dimensions.

A7670

REV.

Project Summary

0S2163

Transportation Planning
2217 St. Marys Blvd.
P.O. Box 270
Jefferson City, MO 65102
Phone (573) 526-8058 Fax (573) 526-8052

Project Manager: ANDY MEYER
(Award Month): 7
Status: 4-ACCEPTED
(Award Year): 2008
Stage: SCOPING
SFY / (STIP SFY): 2009

Route Name	Begin Log	End Log	Begin County	TMA	Travelway ID
RT W E	1.75	1.85	Scott	N	305
RT W W	5.61	5.71	Scott	N	306

System	Func. Class	NHS	AADT	Confl.
Supplementary	Major Collector	N	53	N

Reason And Remarks	Emergency project to replace flood damamged bridge.
Detailed Description	Grading, paving and replace bridge P099 over Ditch 35
Location	1.8 miles east of Rte. P.

Funding Package 1:
Funding Package 2:
Bonding SFY:
Adv. Const/Payback: No
Work Miles: 0.1
Parcel Count: 0
Award Month: 0
Better Roads Brighter Future: No

Federal Oversight: No
Fed. Funding Category: B- BRIDGE
Capitalization Code: 1-C-CAPITALIZED
Adv. RW Year: 0
Bridge Count: 1
Track: No
Award Year: 0
Tip Number:

Primary Category: 1- EXISTING SYS (DIST)
Secondary Category: P- REHAB AND RECONST
Work Type 1: B- BRIDGE REPLACEMENT
Subwork Type:
Work Type 2:
Work Type 3:
Const. Award Cost: 0

Cost Estimate Breakdown

Grading/Drain.	Base Surface	Bridge Est.	Misc.	Contract Est.
40	60	200	60	360

Constr. Conting.	Const. Est.
7	367

Utilities
0

Non Contract	Const. Cost
0	367

R/W Acquisition
0

R/W Incident.	Prelim. Engr.	Constr. Engr.	Ttl Incidental
0	40	25	65

Incent. /Disincent.
0

Prog. Est. Ttl.
432

PE Spent
0

ACT RW Spent
0

ACT Utility Spent
0

Appr. STIP	% Diff.
Const. Cost: 0	10,000.0%
RW Acquisition: 0	0.0%

Prj. Ttl.
432

Lane Miles	Cost/Mile
0.20	800.00

Project Costs

	Prior	2006	2007	2008	2009	2010	2011	2012	2013	Future	Prg Ttl	Total
Preliminary Engineering	0	0	0	0	40	0	0	0	0	0	40	40
Construction	0	0	0	0	367	0	0	0	0	0	367	367

Project ID: 10651
Let By: Central Office
Work District: 10
Length: 0.1
Est. Submittal Date: May 13, 2008

Planning Org	Federal District	Senate District	House District
BOOTHEEL REG PLAN & ECON DEV	8	27	160

MISSOURI DEPARTMENT OF TRANSPORTATION

VENDOR RANKING

DATE : 06/20/08
PAGE : X01 -1

CALL ORDER : X01
LETTING DATE : 06/20/08 11:00 a.m.
CONTRACT ID : 080620-X01
DISTRICT : 10
CONTRACT TIME : 08/31/08 COMPLETION DATE
RURAL ROUTE
COUNTIES : SCOTT
PROJECT(S) : J0S2163

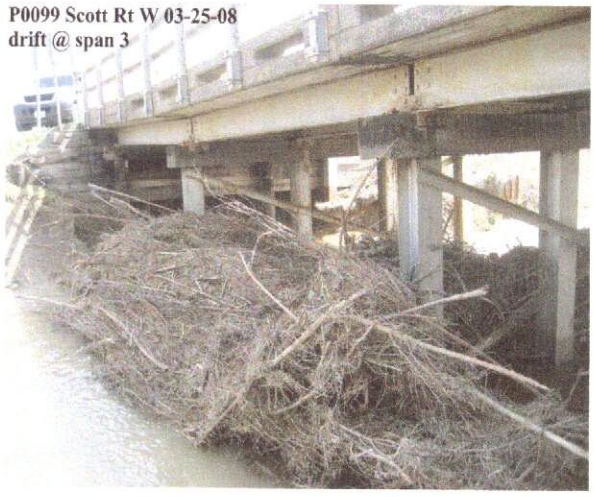
CONTRACT DESCRIPTION :

SET-ASIDE :

RANK	VENDOR NO./NAME		TOTAL BID	% OVER LOW BID
1	0010274	A. E. Simpson Construction Inc.	$ 233,423.00	100.0000%
2	0010722	Robertson Contractors, Inc.	$ 261,676.00	112.1038%
3	0010249	Penzel Construction Company Inc.	$ 313,851.33	134.4560%

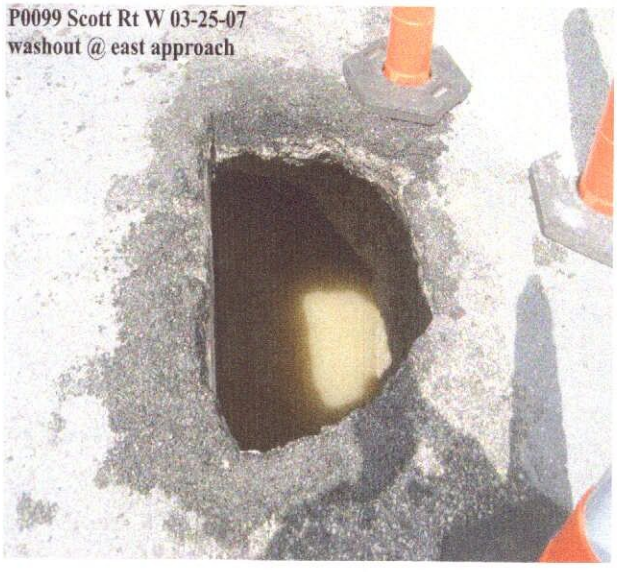
CERTIFIED BY DESIGN
STATE DESIGN ENGINEER

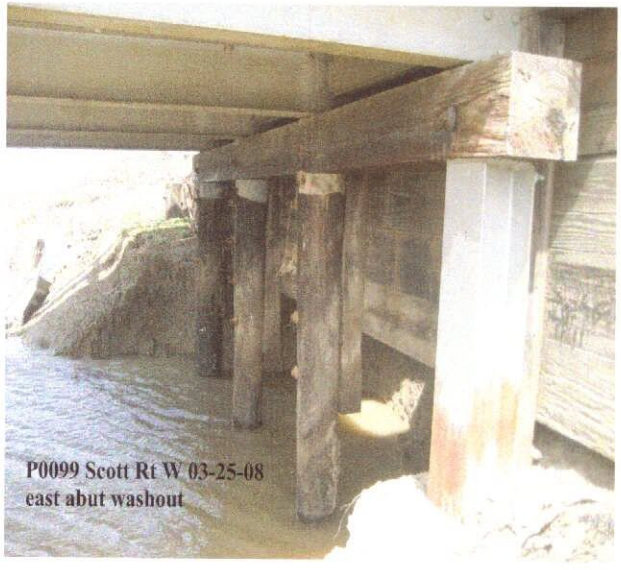
P0099 Scott Rt W 03-25-08
drift @ span 3



P0099 Scott Rt W 03-25-08
sagging @ span 3

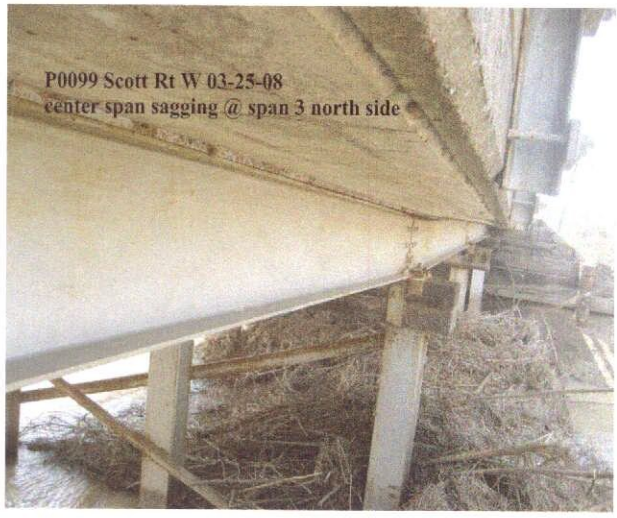
P0099 Scott Rt W 03-25-07
washout @ east approach





P0099 Scott Rt W 03-25-08
east abut washout

P0099 Scott Rt W 03-25-08
center span sagging @ span 3 north side



P0099 Scott Rt W 03-25-08
view to west