



# MEMORANDUM

## Missouri Department of Transportation

### District 5 – Program Delivery

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**TO:** Jay Bestgen  
Assistant State Design Engineer

**FROM:** Steve Engelbrecht   
District Design Engineer

**DATE:** January 16, 2007

**SUBJECT:** Moniteau County, Route 50  
Job No. J5P0632A  
Practical Design  
2007 Awards for Excellence  
Project Summary

This major grading and paving project begins in Cole County at St. Martins and extends to near Route K in Moniteau County. The program cost for the project is \$35,334,000. It will extend the dual lane section of Highway 50 leading to Jefferson City by approximately eleven miles.

District 5 staff developed the design plans for the project on an accelerated schedule. During the design of the project, the estimated construction cost for the original proposed design had risen to \$41,782,573 due to the use of previous design standards and also market price conditions. A copy of the cover page from the February 2006 estimate is attached to this letter. Through the application of practical design, many of the project's features were redesigned to provide cost savings.

Some of the cost saving measures that were used on the project include reduced pavement widths and thicknesses, narrowing ditches where possible, elimination of outer roadway construction where other access is provided, and matching existing pavement thicknesses on outer roads and connections to existing roads. A copy of the project summary sheet is attached to this letter and lists these and other practical design components.

Through the use of practical design, this major project was brought back within budget and was awarded in January 2007 for \$5.4 million under budget. For this reason and the reasons stated above, this project is an excellent example of the application of practical design to a major project.

# 2007 APPLICATION FORM

(required for each entry)

Job No. J5P0632A

Route 50

County Moniteau

STIP Description (Scoping or Construction, state which STIP)

05-09

06-10

07-11

Right of way acquisition, grading, drainage and paving for four-lane divided on relocation from east of California near Rte. K to St. Martins. Amendment 3 new major project.

Project Manager (could have both)

MoDOT Jason Vanderfeltz

Consultant n/a

Active core team members as approved by the MoDOT PM (may include consultants)

Ryan Libbert

David Johns

Steve Engelbrecht

Michelle Neuner

Larry Ayres

Bruce Green

Daniel Smith

Melissa Scheperle

Roger Wolfe

Bree McMurray

Jason Sommerer

Toni Prawl

Alan Trampe

Terry Imhoff

Troy Hughes

Project Contacts (will have both for consultant entry)

District 5

Consultant \$ \_\_\_\_\_

STIP budget \$35,300,000

or

Award cost \$29,874,886.29

Value Engineering study during design? yes  no  (if yes) Project Stage \_\_\_\_\_

VE Contact person n/a

Construction-stage VE (VECP)? yes  no  (if yes) Explain \_\_\_\_\_

This project was let in December 2006.

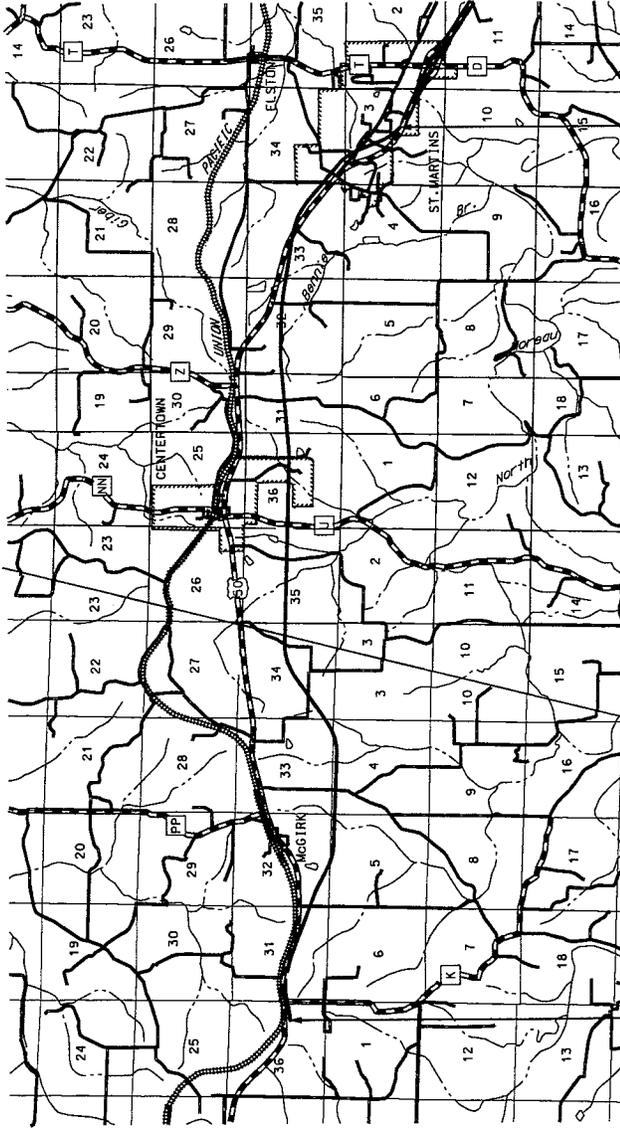
Total VECP savings \$ \_\_\_\_\_

VECP Contact Person \_\_\_\_\_

Why is this entry the "poster" image for MoDOT's practical design philosophy?

(In layman's terms - 100 words or fewer – attach additional sheet if necessary) \_\_\_\_\_

This entry is the poster image for MoDOT's practical design philosophy due to it's strong demonstration of the use of these principles to deliver a major project under budget and ahead of schedule. By applying the practical design concept to each component of the project, the final award cost was \$5.4 million under budget.



NOT TO SCALE

STA. 331+72.71

STA. 475+00.00

PROJECT LIMITS

GRADING, PAVING, & DRAINAGE  
 RTE 50 - MONTITEAU/COLE COUNTY

MONTITEAU CO. 719+17.07 BK.  
 COLE CO. 0+00.00 AK.

Date: 1/10/2007

SUMMARY SHEET

Time: 12:17:41 PM

File Name: T:\DE-PROJ\moniteau\J5P0632\Documentation\j5p0632a feb 06.BDW

JOB: J5P0632	YEAR:	MONTH:	DAY:	DIST.: 05
ROUTE: 50			COUNTY: MONITEAU	
LENGTH: 10.240			COUNTY: COLE	
BEGIN LOG MILES:			END LOG MILE:	
BEGIN STA: 504+00			END STA: 325+00	
LONGITUDE: 92°28'00"			LATITUDE: 38°37'00"	
DESIGNED BY: Michelle Neuner			ESTIMATED BY: Michelle Neuner	
WORK TYPE: 03, Grading, drainage, and paving				

JOB DESCRIPTION: Grading, paving & drainage

LOCATION DESCRIPTION: Rte. K to E/O Claire Rose

COMMENTS:

COST SUMMARY

PROJECT INITIALIZATION TOTALS

ROADWAY	41,782,573.00
LIGHTING	0.00
SIGNALS	0.00
SIGNING	0.00
SPECIAL	0.00
ALT PVMT A	0.00
ALT PVMT B	0.00
ALT PIPE A	0.00
ALT PIPE B	0.00
RESERVED	0.00
	0.00
	0.00
	0.00

GRADING AND DRAINAGE:	\$23,680,530.00
BASE AND SURFACE:	\$16,100,073.00
BRIDGE:	\$0.00
MISCELLANEOUS:	\$2,001,970.00

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BRIDGES	0.00
	0.00
	0.00
	0.00

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CONTRACT TOTAL	41,782,573.00
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NON-CONTRACT	0.00
	0.00
	0.00

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TOTAL ALL COST	41,782,573.00
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**Route 50 – St. Martins to E/O California, Cole and Moniteau Co.  
JSP0632A  
December 15, 2006 Bid Opening**

**STIP Construction Budget = \$35.3 million (Amendment 3 funds)**

- 11 mile 4 – lanes on relocation.
- Project accelerated **9 months** (originally September 2007)
- 68 R/W parcels required, 2 condemned (**11 months acquisition**)
- Moniteau and Cole Counties have agreed to take over existing Route 50 and new outer roads.
- In-house design with over 500 plan sheets. (**12 months for final design**).

**Practical Design Components**

- 12' driving lanes with 4' inside and 10' outside shoulders.
- Pavement slab narrowed from 28' to 26'.
- Mainline pavement thickness reduced from 13" asphalt or 10" concrete to 8" asphalt or 8" concrete.
- Shoulder pavement reduced from 5 ¾" asphalt or concrete to 3 ¾" asphalt or 4" concrete.
- Mainline and outer road pavements and shoulders could be bid as asphalt or concrete or combination. (Bidders choice)
- Eliminated a 2000' outer road and increased grades on all outer roads.
- Matched existing pavement thicknesses and widths on all outer roads or roads being tied into.
- Narrowed ditches, which reduced excavation cost in some areas.
- Allowed drainage pipes and structures bid as traditional materials and construction or alternative.

**Other factors**

- Bidding environment (SRI finished, contractors not carrying work, fuel prices)
- Mild terrain, minimal impact to traffic due to relocation, minimal structures, etc.
- R/W cost have overrun (**9%, \$565,000**) due to HB 1944 but utility relocation cost are under budget enough to offset.

Low Bid \_\_\_\_\_ = \$29.87 million (Illinois Valley Paving)

**\$5.4 million under construction budget.**