

Practical Design 2007 Awards for Excellence Competition



Route ZZ
Franklin County
J6S1676

Designed by: District 6 Design

Summary:

The existing Route ZZ bridge is 45 years old, is 22 ft wide, and has no shoulders. The current ADT of Route ZZ is 305 vehicles/day. The 20 year design ADT is 354 vehicles/day.

Our original design would have constructed a new bridge that was raised four feet higher to minimize flooding in the future, per MoDOT bridge division's practice at the time. The new structure would have been 26 ft wide – two eleven ft lanes with 2 ft outside shoulders. Although we intended to close the road, we still were looking to acquire right of way to accommodate our widened template and elevated profile.

With the advent of practical design, the core team took another look at the scope, and determined that the existing bridge substructure was still adequate and could be used in place. Local residents told us that the road/bridge did NOT have a flooding problem. Whatsmore, the adjacent property owners voiced opposition to right of way acquisition.

Our current scope is to replace the existing superstructure with a prestressed voided slab deck and asphalt surface lift. This innovative solution was inspired by a bridge maintenance treatment of a similar structure in Polk County. The width of the bridge will remain at 22 ft.

By leaving the profile of the roadway the same, we were able to virtually eliminate any reconstruction of the roadway on both approaches to the bridge.

We eliminated the purchase of right of way completely, which added to our cost savings and pleased the public.

Road closure went from a forecasted 6-8 months to less than four weeks.

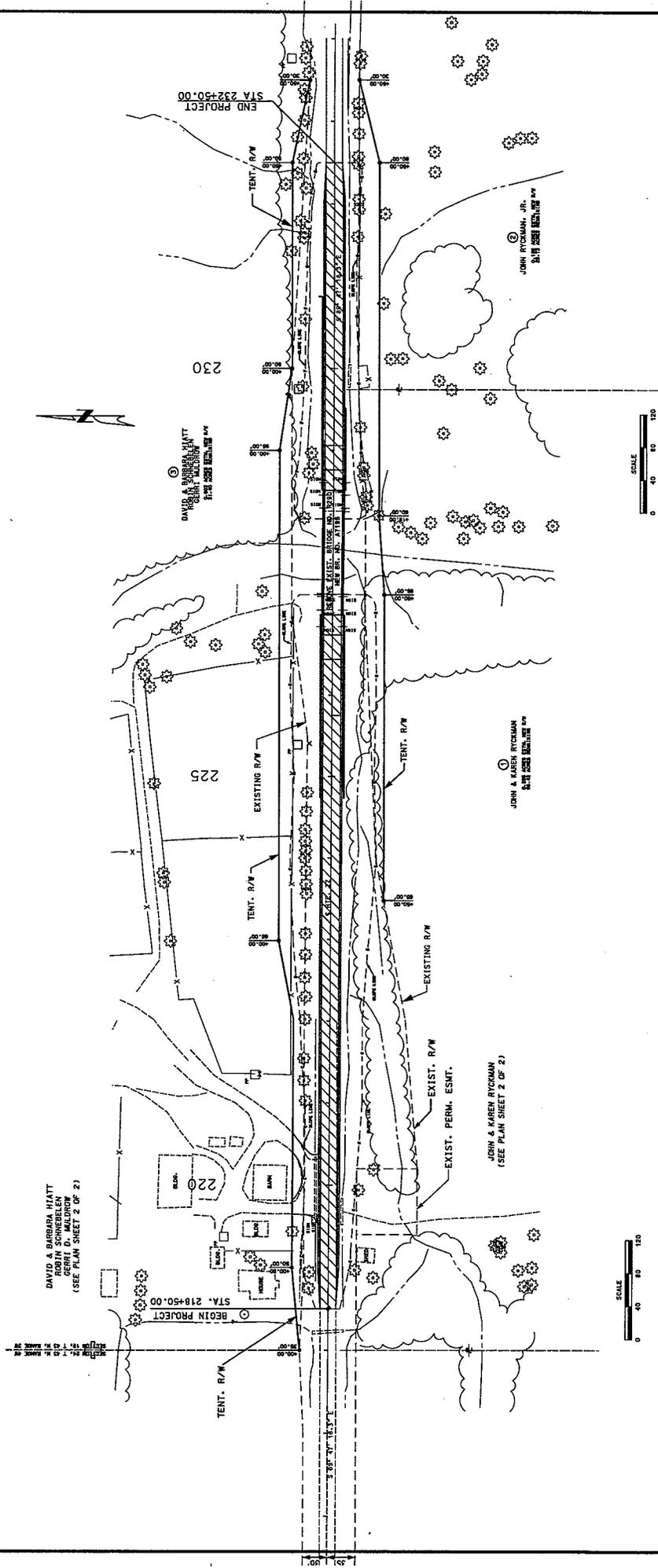
Total right of way and construction costs went from \$713,000 (05-09 STIP) to an apparent low bid of \$299,403.99. The project is scheduled for a February 7, 2007 award.

05-09 STIP Budget:	\$713,000
Apparent Low Bid:	<u>\$299,404</u>
Total Savings:	\$413,596 (58 percent savings)



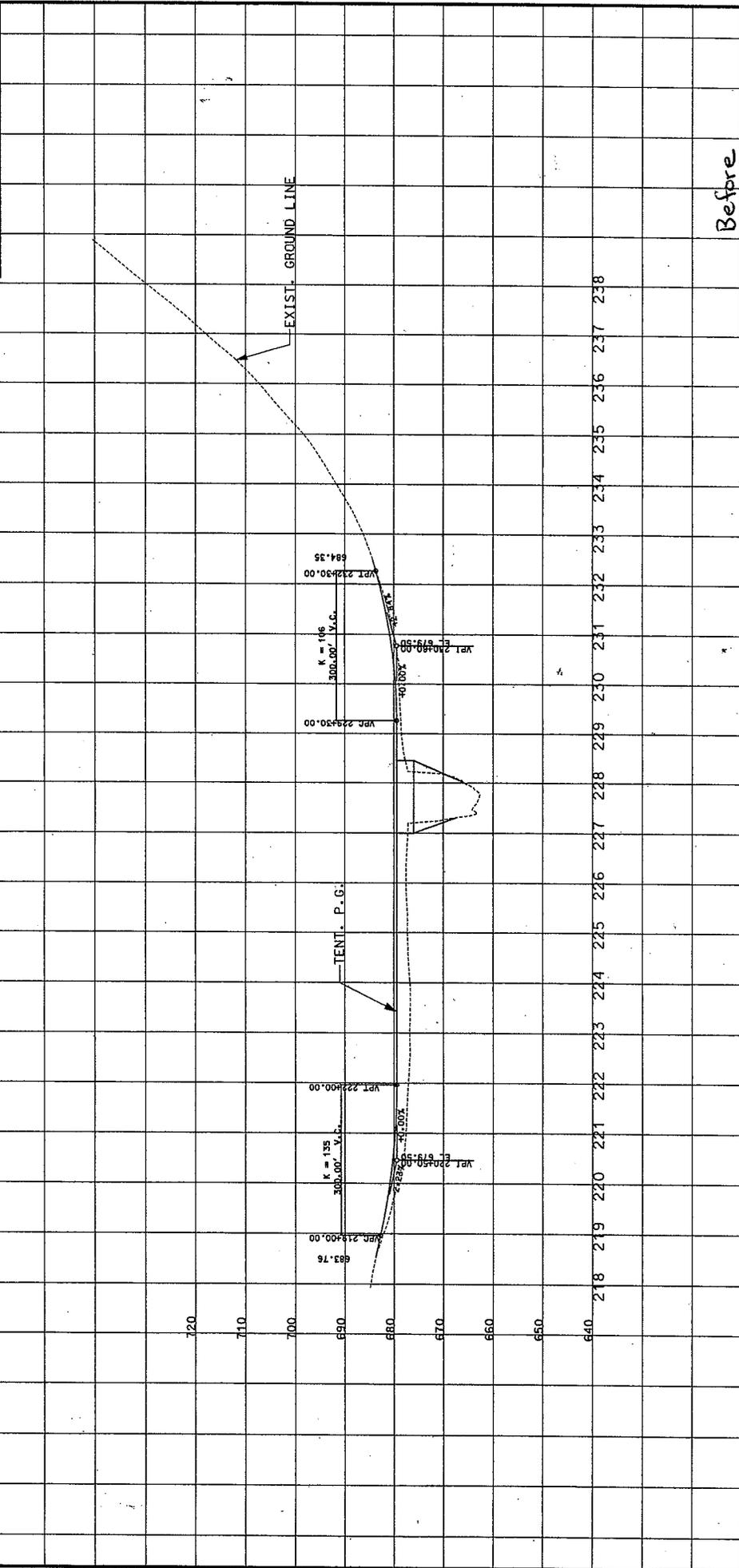


ROUTE	STATE	DISTRICT	SHEET NO.
	MO		
JOB NO.			
CONTRACT ID.			
PROJECT NO.			
COUNTY			
DATE			



Before

STATE	DISTRICT	SHEET NO.
ZZ	MO 6	5
JOB NO. J6S1676		
CONTRACT ID		
PROJECT NO.		
COUNTY FRANKLIN		
DATE		



Before

PROFILE ROUTE ZZ

DATE	MO	6	SHEET NO.	3
ROUTE	ZZ		CONTRACT NO.	J6S1676
			PROJECT ID.	
			COUNTY	FRANKLIN
			DATE	

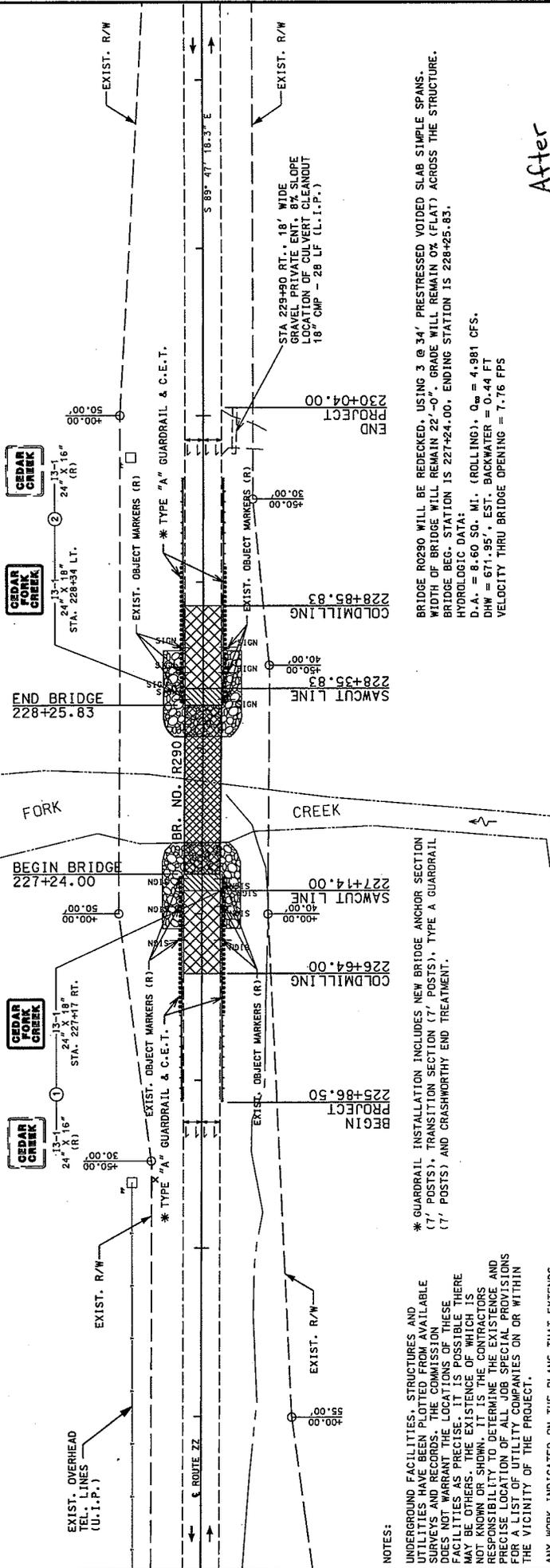


LEGEND

- = FULL DEPTH PAVEMENT REPLACEMENT (SEE TYP. SECTION SHEET FOR DETAILS)
- = PLACE TYPE 2 ROCK BLANKET AROUND BRIDGE ABUTMENTS
- = COLDMILL 1 1/2" AND REPLACE WITH ASPHALTIC CONCRETE (SEE TYP. SECTION SHEET FOR DETAILS)
- = ASPHALTIC CONCRETE OVERLAY (1 1/2" MIN.) OVER NEW BRIDGE DECK. SEE BRIDGE PLANS (SHEET 10 OF 12) FOR DIMENSIONS OF THE VARIABLE THICKNESS OVERLAY TO PROVIDE FOR -2.00% CROSS SLOPE.

225
225

230



NOTES:

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS. THE COMMISSION DOES NOT WARRANT THE LOCATIONS OF THESE FACILITIES AS PRECISE. IT IS POSSIBLE THERE MAY BE OTHERS. THE EXISTENCE OF WHICH IS KNOWN OR SHOWN. IT IS THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXISTENCE AND PRECISE LOCATION OF ALL SUCH UTILITIES FOR A LIST OF UTILITY COMPANIES OR WITHIN THE VICINITY OF THE PROJECT.

ANY WORK INDICATED ON THE PLANS THAT EXTENDS BEYOND THE PROJECT LIMITS IS CONSIDERED INCIDENTAL TO AND A PART OF THE CONSTRUCTION OF THIS PROJECT. SEEDING QUANTITY IS CONSIDERED INCIDENTAL TO AND A PART OF THE CONSTRUCTION OF THIS PROJECT. BEARINGS SHOWN ARE MODIFIED STATE PLANE BEARINGS.

* GUARDRAIL INSTALLATION INCLUDES NEW BRIDGE ANCHOR SECTION (7' POSTS), TRANSITION SECTION (7' POSTS), TYPE A GUARDRAIL (7' POSTS) AND CRASHWORTHY END TREATMENT.

BRIDGE R0290 WILL BE REDECKED, USING 3 @ 34' PRESTRESSED VOIDED SLAB SIMPLE SPANS. WIDTH OF BRIDGE WILL REMAIN 22'-0". GRADE WILL REMAIN 0% (FLAT) ACROSS THE STRUCTURE. BRIDGE BEG. STATION IS 227+24.00, ENDING STATION IS 228+25.83. HYDROLOGIC DATA:
D.A. = 8.60 SQ. MI. (ROLLING), $C_w = 4.981$ CFS.
DHW = 671.95', EST. BACKWATER = 0.44 FT
VELOCITY THRU BRIDGE OPENING = 7.76 FPS

After

DISCLAIMER
THE PROFESSIONAL DESIGNER ASSUMES RESPONSIBILITY ONLY FOR WHAT APPEARS ON THIS PAGE, AND DISCLAIMS LIABILITY TO SECTION 327.41 (RSMO) DOCUMENTS OR INSTRUMENTS NOT SEALED BY THE UNDERSIGNED PROFESSIONAL RELATING TO OR INTENDED TO BE USED FOR ANY PART OR PARTS OF THE PROJECT TO WHICH THIS PAGE REFERS.

ROUTE ZZ
PLAN SHEET
SHEET 1 OF 1

2007 APPLICATION FORM

(required for each entry)

Job No. J6S1676

Route ZZ

County Franklin County

STIP Description (Scoping or Construction, state which STIP)

05-09

06-10

07-11

Replace bridge at Cedar Fork Creek 0.07 mile east of Route Y. Project involves bridge R-290.

Project Manager (could have both)

MoDOT Tim Schroeder

Consultant N/A

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

Judy Wagner

Dean Franke

Heather St. John

Bill Langenbacher

Jim Smith

Sara Nelson

Tim Hellebusch

Ralph Rankin

Cathy Calvin-Rispoli

Pat Martens

Joe Kussman

Phil Ruffus

Project Contacts (will have both for consultant entry)

District Tim Schroeder

Consultant \$ _____

STIP budget \$ 229

or

Award cost \$ _____

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 _____

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) See Attached.

Send entries to:

MoDOT Design Division, ATTN: Jay Bestgen
1320 Creek Trail Dr.
Jefferson City, Missouri 65109

All entries must be received no later than close of business on February 1, 2007

Why is this entry the “poster” image for MoDOT’s practical design philosophy?

Scope Comparison: When you examine the scope before and after practical design, you’ll see that the design elevation of the bridge was lowered from its calculated “standard” elevation due to public input that the road didn’t experience flooding problems. By keeping the profile the same as existing, we were able to virtually eliminate any reconstruction of the roadway on both approaches to the bridge. This, in turn, eliminated the need to acquire additional right of way, which added to our cost savings and pleased the public. We were able to utilize the existing bridge substructure in place, which lowered the bridge cost even further.

Purpose and Need: The purpose and need of this project was to replace the existing bridge on Route ZZ over Cedar Fork Creek. We didn’t need to widen the road, so the two feet shoulders were eliminated. It turned out that we didn’t need to elevate the new structure to alleviate a known flooding problem, so we didn’t have to reconstruct the roadway approaches. The replacement superstructure would expect to have about a 30 year life span verses the new bridge replacement would have about a 75 year life span with the deck requiring treatment in about 40-50 years.

New techniques and non-traditional design: MoDOT Bridge Maintenance was successful in replacing a bridge deck on a similar structure (R03111) in Polk County over the course of one weekend. Our bridge division learned from the success of this innovative solution, and brought the same concept to the Route ZZ project. The solution seemed to fit our purpose and need perfectly.

Cost Savings: The total right of way and construction costs went from \$713,000 (05-09 STIP) to an apparent low bid of \$299,403.99. The project is scheduled for a February 7, 2007 award.

05-09 STIP Budget:	\$713,000
Apparent Low Bid:	<u>\$299,404</u>
Total Savings:	\$413,596 (58 percent savings)

Roadway User Expectations: We went to a public meeting with our “before” plan right as MoDOT was introducing the concept of practical design. The public sentiment was that the road did NOT have a flooding problem, so there was no need to raise the elevation of the bridge. The public was also opposed to having the road closed for six to eight months. Whatsmore, the adjacent landowners voiced opposition to right of way acquisition. By altering the scope of this project, we were able to address all of these concerns, and thus, meet their roadway user expectations.