



February 1, 2007

Mr. Jay Bestgen
MoDOT Design Division
1320 Creek Trail Drive
Jefferson City, MO 65109

Re: 2007 Awards for Excellence: MoDOT Practical Design Contest Submittal

Dear Mr. Bestgen:

HDR Engineering is pleased to enter the Route 61 bridge replacement over Establishment Creek project for consideration for the 2007 Awards for Excellence competition. HDR recognizes that this will be a challenging competition and are confident that our submittal will demonstrate the significant practical design effort that was undertaken and the resultant cost savings from this process, and the Route 61 project will stand apart from the remaining contest submittals.

The bridge replacement of Rte. 61 over Establishment Creek (J0P0673) is located approximately 0.3 miles north of Rte. V in Ste. Genevieve County. The existing 246' long, 2-span truss structure, built in 1931, is functionally obsolete due to a 20-foot width and 14'3" height limitation. The bridge is structurally deficient with ratings for the deck, superstructure, and substructure of 5, 5, and 6, respectively. Overhead truss members have received significant damage in the recent past from over-height construction equipment (see Appendix 1).

A. Scope Comparison

The original project design called for realigning Rte. 61 and building a new structure, while maintaining traffic on the existing bridge (see Appendix 2). This plan called for approximately 2,900 feet of new roadway, acquiring 5.98 acres of right-of-way from 8 parcels, raising the profile along the north approach through the floodplain, a significant rock cut along the south approach, utility relocations, impacts to forested wetlands on the northwest quadrant, and possible cultural resource issues.

Through the efforts of the MoDOT project core team, led by Andy Meyer, and HDR's application of the practical design process, the redesign of this project will build a new structure on the existing alignment, utilizing a road closure during construction (see Appendix 3). The practical redesign of this project now calls for approximately 430 feet of roadway reconstruction, acquiring 0.02 acres of right of way from two parcels, maintaining the existing vertical profile, minimal utility and environmental impacts, and no cultural resource issues.

The overall scope of the project and the resultant impacts to the surrounding parcels, utilities, and the environment have been significantly reduced through the consistent application of practical design principles at all stages of the design process.

B. Purpose and Need

The purpose and need for this project is clearly demonstrated by the structural ratings of the existing structure and by the height and width limitations. The proposed design will replace the current truss structure with a plate girder structure and a wider typical section will be constructed. This will eliminate the deficiencies in the current height and width limitations. The accident rate for this stretch of Rte. 61 is well above the statewide rate for similar class roadways. The majority of the accidents are a direct result of the narrow roadway width on the bridge and the limited vertical clearance due to the truss structure.

A replacement structure on the existing alignment will provide the smallest degree of impacts to the surrounding homeowners while still satisfying the needs of the traveling public. HDR proposed design exceptions to match the existing horizontal clearances and for installation of long post guardrail to limit excessive fill slopes, which will minimize impacts while still providing a safe, efficient, and effective design.

C. New Techniques, Methods, and Non-Traditional Design

The use of advanced surveying techniques allowed for faster collection of data and a more accurate existing terrain model. LiDAR (Light Detection and Ranging) is a scanning and ranging laser system that allows for accurate contour modeling and data collection even while leaves are on the trees. This technique was chosen for this project to accurately model a 50-foot rock bluff on the south side of the creek and the existing rock outcroppings along the south roadway approach to the structure. The enhanced accuracy of the contour model (0.5 feet) allowed for delineation of the forested

wetlands on the northwest quadrant of the structure while requiring no additional field work. A significant amount of field work was saved by utilizing this technique. Another benefit of the LiDAR system was that there was no delay in the schedule while having to wait for optimum field conditions to begin surveying. The aerial survey commenced immediately and the LiDAR scans were utilized to fill in the gaps in coverage where vegetation obscured the aerial mapping. This new surveying technique allowed for more accurate data collection, a faster surveying schedule, and provided additional savings to the overall project budget.

The complete road closure, in conjunction with a signed detour along Interstate 55, which runs parallel to Rte. 61, will allow the contractor uninhibited access to the site. By utilizing this option, it is anticipated that the project can be completed within 90 working days. This will limit the disruption to the surrounding communities and eliminate conflicts with the start of a new school year and existing bus routes.

Another practical design methodology that was applied to this project was the use of a design exception to match the existing hydraulic performance. Through interviews with MoDOT maintenance personnel and adjacent landowners it was determined that the existing structure has never been overtopped, including the 1993 Mississippi River backwater condition. The approach roadway north of the structure has flooded infrequently in the past, but the existing structure has not been impacted. This design exception allows the use of a minimal grade raise and further limits the impacts to the surrounding area, including the forested wetlands in the northwest quadrant.

D. Cost Savings

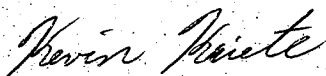
The project is currently listed on the 2009 STIP, with a total program cost of \$1.98 million, including incidentals (see Appendix 4). The current engineers estimate shows a total program cost of \$1.63 million, including incidentals (see Appendix 5). This savings of 17.6% is directly attributable to the efforts in implementing the practical design process on this project. The original award estimate was \$1.52 million and the current award estimate is \$1.23 million, a 19.1% reduction. Rep. Carnahan earmarked \$1.2 million for this project in a recent transportation reauthorization bill. This earmark shows the importance of this project for the entire region. The design team has consistently found ways to provide a quality project and still drive down the overall construction cost. While giving the traveling public an efficient and safe roadway, this process has allowed a significant reduction in the project impacts and a substantial cost savings which can be applied towards other priority needs in the region.

E. Roadway User Expectations

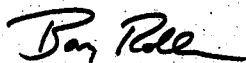
The users of this roadway currently encounter a narrow width crossing that has a low vertical clearance. The structure has been damaged in multiple locations, the truss members are rusting, the side rails are broken, and in some instances, the last remaining evidence of the barrier edge curb is the longitudinal reinforcing steel. This design will replace a crossing which allows for efficient travel along Rte. 61 and provides a link to Rte. Y and Rte. V. The expectations for project are that none of the above conditions will remain when the new structure is completed, that accidents through this area will decrease, that the proposed road closure will shorten the construction schedule, that a well marked detour will minimize traffic disruptions during construction, and that the most "bang for the buck" can be gotten out of each dollar that is allocated to this bridge replacement. An indication that the proposed design meets roadway user expectations is that recent newspaper articles about the project and announcements regarding an upcoming public meeting have generated no negative responses towards the concept. This indicates that the project is meeting the public's goals and expectations for a successful project.

HDR Engineering is proud of the steps that were taken during the Route 61 bridge replacement over Establishment Creek project. The practical design methods that were implemented will provide the traveling public a highway system that serves their needs. This project is representative of the desire to deliver a transportation system better, faster, and cheaper than before. It illustrates the need to rebuild the highway system and not overbuild our future projects. It demonstrates our commitment to providing efficient, safe, and cost-effective design solutions to MoDOT and the motorists who travel the highway system everyday.

Sincerely,
HDR, Inc.



Kevin Kriete, PE
Project Manager



Barry Rolle, VP, PE
Project Principal

Appendix 1 • J0P0673: Route 61 over Establishment Creek



Aerial: Route 61 over Establishment Creek



Looking East along Establishment Creek



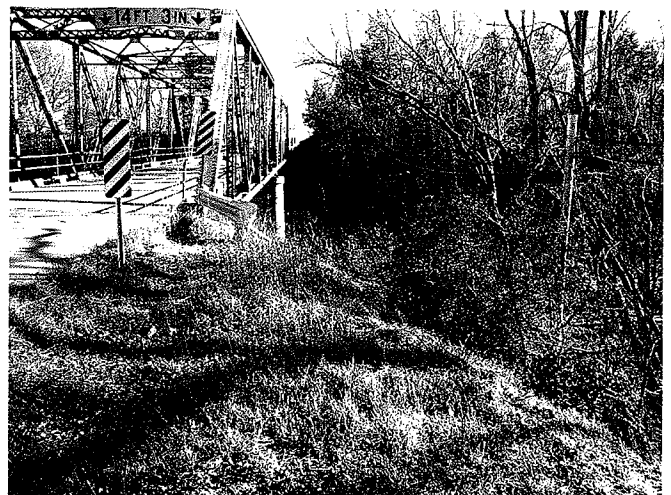
Southbound Heavy Equipment



West Side Edge Barrier

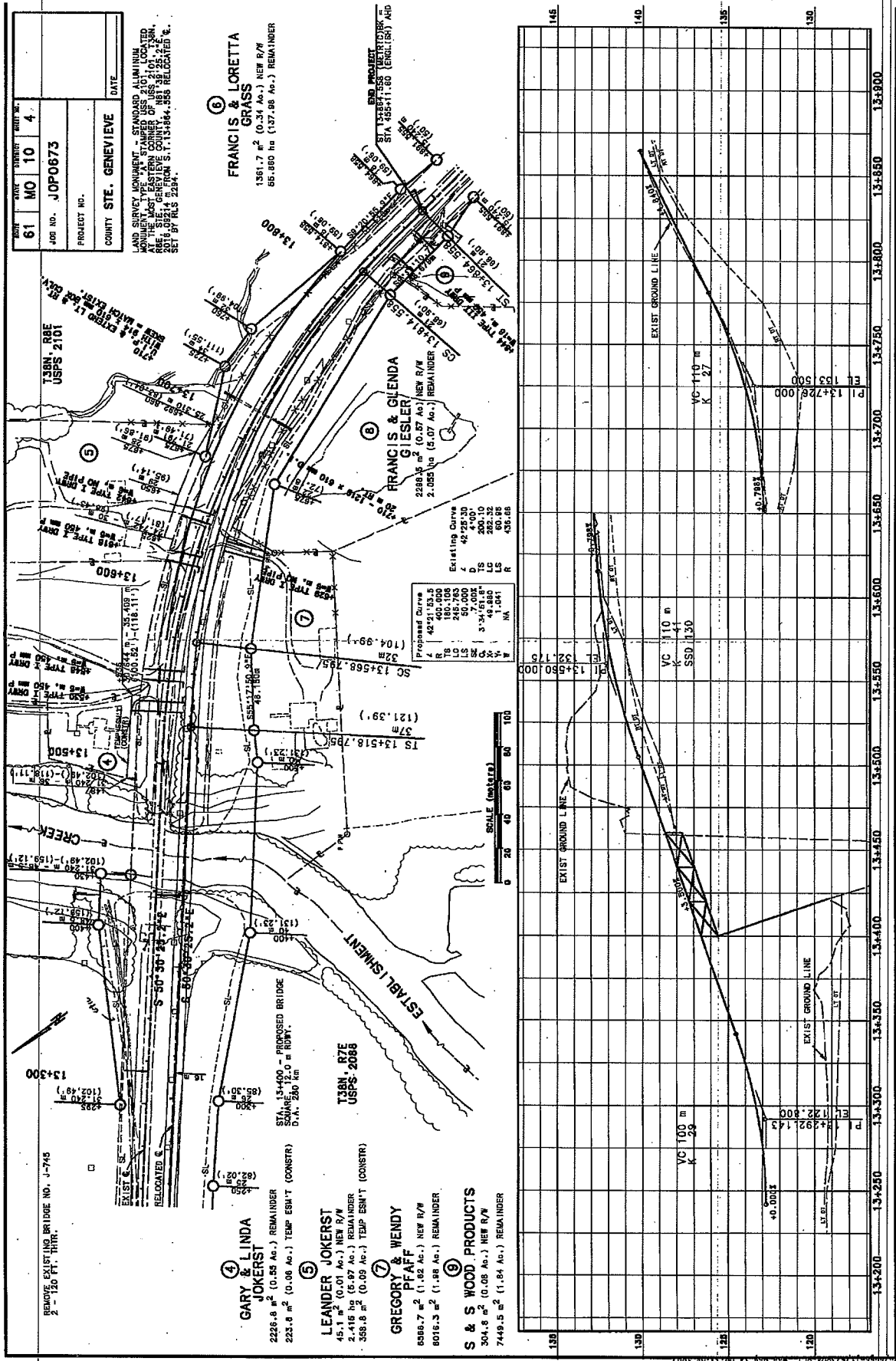


Northbound Roadway Approach



Looking South along Proposed Realignment

Appendix 2 • JOP0673: Route 61 over Establishment Creek



Appendix 4 • JOP0673: Route 61 over Establishment Creek

ORIGINAL BUDGET:

Grading & Drainage +	Base & Surface +	Bridges +	Misc. +	Estimated Contract Total =		PE Spent	ACT RW Spent
\$72	\$84	\$1,070	\$291	\$1,517		104	0
				Construction Contingency (est. @ 2% of contract total)	Contract Total+ Construction Contingency =		
				+	\$30	\$1,547	
				+	Utilites		
					\$26		
				+	Non Contractual Items	Total Construction Cost =	
					\$14	\$1,587	
				+	R/W Acquisition		
					\$20		
R/W Incidentals +	Preliminary Engineering Incidentals +	Construction Engineering (est. @ 7% of contract total) +		Total Incidentals			
\$5	\$160	\$106		\$271			
				+	Construction Incentives / Contract Acceleration		
					\$0		
					Program Estimated Total =		
					\$1,878	Prj. Ttl.	
						1,980	

Appendix 5 • JOP0673: Route 61 over Establishment Creek

REVISED BUDGET (practical design implemented):

Grading & Drainage +	Base & Surface +	Bridges +	Misc. +	Estimated Contract Total =		PE Spent	ACTRW Spent
\$25	\$24	\$1,070	\$114	\$1,233		104	0
				Construction Contingency (est. @2% of contract total)	Contract Total+ Construction Contingency =		
				\$25	\$1,258		
				Utilites			
				\$7			
				Non Contractual Items	Total Construction Cost =		
				\$14	\$1,279		
				R/W Acquisition			
				\$5			
R/W Incidentals +	Preliminary Engineering Incidentals +	Construction Engineering (est. @7% of contract total) +		Total Incidentals			
\$5	\$155	\$86		\$246			
				Construction Incentives / Contract Acceleration			
				\$0			
				Program Estimated Total =		Prj. Ttl.	
				\$1,530		1,634	

2007 APPLICATION FORM

(required for each entry)

Job No. J0P0673 Route 61 County Ste. Genevieve

STIP Description (Scoping or Construction, state which STIP) 05-09 06-10 07-11

Grading, paving, and replace bridge over Establishment Creek located 0.3 miles north of Route V.

Project involves Bridge J0745.

Project Manager (could have both)

MoDOT Andy Meyer, PE (District 10)

Consultant Kevin Kriete, PE

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

Dale Kinneman, PE (MoDOT) David Peyton, EIT (MoDOT) Donald Crites (MoDOT)

Randy Richardet (MoDOT) Russell Weisman (MoDOT) Daniel M. Smith, PE, SE (MoDOT)

Matt Malone, PE (MoDOT) Melissa Scheperle (MoDOT) Mike Ecker, PE (HDR)

Lynelle Luther, PE (MoDOT) Bruce Green, PE (MoDOT) Tim Rogaczewski, PE (HDR)

David Wyman, PE (MoDOT) Tonya Wells (MoDOT)

Project Contacts (will have both for consultant entry)

District Andy Meyer, PE

Consultant Kevin Kriete, PE

STIP budget \$ 1.95 million

or Award cost \$ 1.63 million (estimate)

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

VE Contact person _____

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) The Rte. 61 bridge replacement over Establishment Creek illustrates how practical design philosophy can significantly reduce the impacts to the surrounding public, save construction costs, and still meet user expectations. Through the use of a roadway closure, targeted design exceptions, and the efforts of all members of the core team and design staff, the total program cost has been reduced by 17.6%, the project length reduced by 85%, and right-of-way acquisition was reduced by 99%. The resulting project will satisfy all the needs of the traveling public while saving money to be used toward other vital enhancements.

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