

January 31, 2007

MoDOT Design Division
1320 Creek Trail Drive
Jefferson City, Missouri 65109

ATTN: Jay Bestgen

RE: Practical Design
2007 Awards for Excellence
Route 65, Taney County
Job No. J8P0609
S/O Route 165 to the Arkansas Border

EFK♦Moen, LLC is pleased to have the opportunity to submit this project for the 2007 Awards for Excellence in Practical Design. This eight-mile project constructs two new twelve-foot lanes on Route 65 to provide a four-lane divided highway between Route 165 and the Arkansas border. This is part of an overall ten mile construction corridor which includes a major bridge over Lake Taneycomo, a single point urban interchange in Hollister, widening Business Route 65 from two to five lanes in Hollister, and ten miles of widening from two lanes to a four-lane divided highway. The section north of Route 165 was completed and open to traffic in November 2006. The eight-mile section south of Route 165 is scheduled to be open to traffic in late 2007.

District 8 first contracted with EFK♦Moen in 1999 to begin conceptual through final design plans for this ten mile section of Route 65. This was the last section of Missouri Route 65 to be converted to a four-lane divided highway between I-44 and the Arkansas border. Since 1999, we have provided five construction projects on time and within budget for District 8, with a total construction cost of over \$58 million, not including right of way acquisition and miscellaneous local utility improvements.

The picture to the right shows the northern part of the project where over 100,000 cubic yards of rock fill base were stored from the interchange project on Route 65 north of this project in Hollister. The interchange project had significant rock cut suitable for base, with the southern project lacking sufficient rock. One of our cost saving strategies for both projects was to store the rock from the northern project on the future southbound lane right of way. It is now being removed and placed in its ultimate location.



The total costs savings due to Value Engineering and MoDOT's Practical Design Initiative is estimated to be just under **\$30 Million**.

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We are submitting this project in coordination with the District 8 Transportation Project Manager, Mr. Chad Zickefoose, P.E. EFK♦Moen's Project Manager, PJ Kronlage, has been on this project since it began in 1999. Four MoDOT project managers have worked with us on this ten-mile corridor: Linda Bokel, Bill Steininger, Jay Waggoner, and Chad Zickefoose. Gayle Davis, the MoDOT Resident Engineer, has overseen all of these projects, and even helped construct the two-lane Route 65 relocation in the early 1970's.

The savings on this project is the result of a number of changes in philosophy towards highway needs in this area that differed from the original Conceptual Report, which was approved in 2003. The conceptual project scope was to provide a freeway with only two grade separated access points at Route 86 and Route 265. The interchange at Route 265 was to ultimately be the terminal of the Highroad (Route 465). Construction funding for Route 465 is not available in the foreseeable future.

A week-long Value Engineering Study was conducted after the Conceptual Report was approved. This was before practical design, however this also helped changed the philosophy of the true needs of this area. This study recommended the elimination of several outer roads and bridges, producing more savings, and still meeting the traffic access needs.

During the design process, traffic demands at Routes 265 and 86 were analyzed and the team determined that acceptable levels of service could be attained at these two locations with at-grade signalized intersections. Several other low-volume at-grade intersections were left in place, and several of them will provide only right-in/right-out access. This saved construction and right of way costs by eliminating the need for almost four miles of outer roadway.

Route 65 will now be a four-lane divided expressway all the way from I-44 to Harrison, Arkansas. Sections of Route 65 north of Branson also function as expressways with limited at-grade access. The expressway design versus the freeway concepts originally planned is a practical solution that will serve the projected traffic demands, and better meet the driver's access expectations.

By applying Practical Design strategies, shoulder and pavement thicknesses were reduced, the ditches were reduced to a three-foot minimum depth, the median was narrowed, and other minor adjustments were made to cross sections to minimize cuts. Earthwork waste for the project was almost completely eliminated. Since the median was narrowed, acceleration and deceleration lanes were added to the median to provide the safest roadway possible for current and future needs. Advanced flashing "SIGNAL RED AHEAD" signs were added to inform traffic about approaching signalized intersections, and advanced signing for non signalized crossovers were added.

The result of all these applications, with EFK♦Moen working together with MoDOT design, maintenance and construction personnel, provides a roadway which will serve the needs of traffic for many years to come, at the most efficient cost possible while meeting drivers' expectations and without compromising safety.

Thank you for your time and consideration of this application for the 2007 Practical Design Awards of Excellence. Please contact us if you need additional information.

Sincerely,



Linda Moen, P.E.

President, EFK♦Moen, LLC

2007 APPLICATION FORM

(required for each entry)

Job No. J8P0609 Route 65 County Taney

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

Grading and paving to upgrade to expressway from south of Route 165 in Hollister to Arkansas state line. Major project made possible by Amendment 3.

Project Manager (could have both)

MoDOT Chad Zickefoose

Consultant P.J. Kronlage

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

<u>Chad Zickefoose</u>	<u>Matt Seiler</u>	<u>Malissa Julien</u>
<u>Andy Mueller</u>	<u>Bob Becker</u>	<u>Jim Smith</u>
<u>Connie Wilson</u>	<u>Mark Mais</u>	<u>P.J. Kronlage</u>
<u>Gayle Davis</u>	<u>Angela Eden</u>	<u>Bob Orange</u>

Project Contacts (will have both for consultant entry)

District Chad Zickefoose

Consultant \$ P.J. Kronlage

STIP budget \$ N/A - no constr. or Award cost \$ 27,216,974
shown on original program

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

VE Contact person Mike Shea (MoDOT)

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

none to-date

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) _____

please 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

2007 Application Form

Why is the Route 65, Taney County Project No. J8P0609 entry the “poster” image for MoDOT’s practical design philosophy?

The original project scope was to widen a two lane undivided highway into a “standard” four-lane divided freeway, with no at-grade access. Through a Value Engineering study and the application of Practical Design guidelines, significant changes were made including:

- Changing the freeway concept to an expressway
- Reducing the standard 60-foot median to 50-foot
- Eliminating two interchanges and allowing at-grade intersections
- Eliminating four miles of outer roadway
- Reducing ditch depth, pavement and shoulder depth
- Altering cross sections to minimize cuts and fills

The final changes resulted in approximately \$30 million in construction savings.

**Practical Design and Cost Savings Summary for
MoDOT Project Number 8P0609**

Project Purpose and Need

Route 65 is the main highway corridor for the Branson and Hollister areas, which continue to grow in population, popularity, and tourism - all resulting in increased traffic. Traffic volumes on Route 65 between Route 86 and Hollister are at capacity for a two-lane road, especially during peak tourism months. Traffic projections indicate that a four-lane divided highway is needed. Several quarries, which add large volumes of slow moving trucks, have also increased the traffic congestion in the area. Routes 86 and 265 intersect Route 65 in this corridor, and provide the main access to Lake Taneycomo and Table Rock Lake. The future extension of the High Road will end with an interchange in this corridor near the existing Route 265 intersection.

This project on Route 65 completes the last section of divided highway between Interstate 44 in Missouri and Harrison, Arkansas. The original plan for this eight-mile section of Route 65 was a fully limited access four-lane divided freeway, with a sixty-foot median. Grade separated access was proposed at each of the state routes in the corridor with an interchange at Route 265 and an interchange at Route 86. Nearly eight miles of outer roads were to be newly constructed or rebuilt to provide all parcels access to Route 65 and to the region's local and county road system. Several bridges were to be constructed across Route 65 to connect the outer roads to the two interchanges. The construction cost estimate for the original scope was over \$56 Million.

Scope Comparison

During the preliminary design phase, outer roads and interchanges were planned for the fully limited access freeway. When the right of way and final plans were designed, traffic volumes and local access needs indicated that an expressway with strategic at-grade access locations would be the most appropriate and practical design until the traffic volumes reach a level high enough to create a capacity or safety need for fully limited/grade-separated access. In Arkansas, Route 65 is a four lane divided expressway with limited at-grade access. North of Branson, several sections of Route 65 were constructed as an expressway, with several at-grade access points between interchanges. These sections of Route 65 north and south of the proposed project are adequately serving the traffic needs.

The grade separated interchanges at Routes 86 and 265 were also redesigned as at-grade signalized intersections, because traffic volumes did not warrant the full interchanges at the time of construction.

A Value Engineering (VE) Study was conducted as part of the MoDOT/FHWA requirement for projects over \$10,000,000. The VE Study proposed the elimination of several miles of outer road and bridge crossovers.

New Techniques, Methods, and Non-Traditional Design

Using Practical Design strategies, the shoulders were reduced to A2 type shoulders and the pavement thickness was reduced from twelve to nine inches, which still exceeds the existing Route 65 pavement thickness, which has held up well since it was constructed in the 1970's. The median was reduced from sixty to fifty feet, which still met safety clear zone guidelines, but reduced the amount of earthwork and right of way required for the mainline and for the outer roads. The depth of the ditches throughout the corridor was reduced from the four-foot standard used with two-foot rock base, to a three-foot minimum depth. This ditch design still allows the sub-base to drain to the ditches, still provides safety clear zone slopes and still handles the calculated volumes of water. At several locations where an existing local/county road was at the edge of the right of way and the mainline outside slopes were in cut sections, the Route 65 ditch was eliminated and a short section of curb was designed at the back of the shoulder to keep the mainline roadway cross section within the right of way, avoiding right of way and reconstruction of the local/county road. The fifty-foot median, shallower ditches, and further miscellaneous adjustments to the cross sections saved over one million cubic yards of rock and soil excavation, and almost completely eliminate earthwork "waste" on the project.

The Route 65 interchange project in Hollister to the north required substantial rock excavation. To add to the overall cost savings in the corridor, the project team used the existing right of way areas on the southern project to stockpile this rock for use on the future project to the south, which saved substantial dollars on both projects – the contractor to the north did not have to "waste" the excavated rock, and the future project to the south had the majority of the rock base furnished on site.



Stockpiled Rock in the Route 65 Corridor

Cost Savings

The construction cost for this project was not listed in the STIP. The concept report for this project, prepared in 2003, is attached, showing a concept cost estimate of over \$56 million. Note that this estimate was prior to the recent escalations in asphalt and bridge costs. Also attached are the actual bid prices received from contractors in May 2006, showing a total construction bid cost of \$27. Almost **\$30 million** in construction cost was saved when these two prices are compared.

The right of way savings, which consisted of twenty-one acres, one residence, two sheds, and one cell tower were not officially calculated.

The following table illustrates the original project scope and the final design after the team completed the design using value engineering and practical design guidelines:

Original Plan	Final Practical Design
Freeway Design	Expressway Design
Two New Diamond Interchanges at Route 86 and Route 265	Two At Grade Signalized Intersections at Route 86 and Route 265
60 Foot Median	50 Foot Median
4 Foot Minimum Depth Ditches	3 Foot Minimum Depth Ditches
8 Miles of Outer Rebuilt or Newly Built	4 Miles of New or Rebuilt Outer Roads
Full Depth Pavement Shoulders on Outer Roads and Mainline	A2 Shoulders on Mainline, Earth Shoulders on Outer Roads
	Saved 21 Acres of R/W, 1 Residence, 2 Sheds, 1 Cell Tower
Construction Cost Estimate ~\$56 Million	Construction Bid \$27 Million



Roadway User Expectations

The public was very involved in this project. The total corridor involved five construction projects, with improvements including a new dual bridge over Lake Taneycomo, an interchange at Route 165, a redesign of Business Route 65, Route V, Route 165 and the outer roads to provide access to the new interchange, and the addition of two lanes from Lake Taneycomo to the Arkansas border. Throughout the design and construction of these projects, the City of Hollister hosted a monthly “Partners in Progress” meeting to get public input and to report on design and construction progress to all interested people. These meetings were well-attended by local officials, newspaper reporters, the design team, contractors and interested property owners and residents.



Route 65 Corridor in Hollister, Missouri

Several formal public meetings were held in the area to get public input throughout the design process. The final design concepts are well-received by the public and by the local cities and community groups. The majority of official comments received were in favor of at-grade crossings which create less delay to access Route 65, and less impacts to the surrounding properties. Four lane expressways exist to the north and south of this project on Route 65, therefore this expressway is a natural extension of the drivers' expectations, and does not go beyond the purpose and need of this area. Acceleration and deceleration lanes are added at the at-grade crossovers to minimize turning movement disruption for the mainline traffic. To help alert drivers in advance of the at-grade signalized intersections, “RED SIGNAL AHEAD” signs are being installed.

Another significant benefit of this practical design is that the construction of this expressway will take significantly less time than the construction of the grade separated interchanges and the freeway corridor. The reduced property acquisition will also be less disruptive to the region.

RSMo 21.795.2.(3)

*NOTE - Three percent inflation compounded annually applied to program years 2, 3, 4, and 5;
 Three percent Construction Contingency applied to Construction

STATE FISCAL YEAR PROJECT BUDGET
 7/2000- 7/2001- 7/2002- 7/2003- 7/2004- 7/2005-
 SPENT 6/2001 6/2002 6/2003 6/2004 6/2005

County: Taney Grading, paving, bridges and interchanges to upgrade to freeway from south of Rte. 165 in Hollister to Arkansas line.
 Route: 65
 Job No: 8P0609
 Length: 8.3
 Category: System Expansion

Incidentals:	208	500	515	453	0
R/W:	0	0	0	3664	0
Const:	0	0	0	0	0
FFOS:	0	0	0	0	0
Accel/R/W:	0	0	0	0	0
Accel Const.:	0	0	0	0	0

Award: Future Fed. Fund. Cat: NHS

CONCEPTUAL COST SUMMARY SHEET

Date: 01/31/2003 Time: 7:32:55 AM

File Name: Y:\9905035-D8_RTE65\Spreadsheets\609-1-31-03+Res.bdww

TOTAL ALL COST 56,559,697.98



2006 - 2010 Highway and Bridge Construction Schedule

Transportation Planning
 2217 St. Mary's Blvd.
 P.O. Box 270
 Jefferson City, MO 65102
 Phone (573) 526-8038 Fax (573) 526-8052

Construction contingency applied to construction cost in the year the project is awarded.
 Two percent inflation compounded annually is applied to right-of-way and construction costs in program years 2, 3, 4 and 5.
 No inflation is applied to the Funding From Other Sources (FFOS).
 Incidentals include PE costs, CE costs, and R/W incidentals.

County:	Route:	Job No.:	Length:	Fund Cat:	MPO:	STATE FISCAL YEAR PROJECT BUDGETING					
						2006	2007	2008	2009	2010	Incidentals:
Taney	US 65	8P0609	8.07	Amendment 3	N	2955	0	0	0	0	0
						2462	0	0	0	0	0
						30583	0	0	0	0	0
						0	0	0	0	0	0
						0	0	0	0	0	0

CALL ORDER : 801 CONTRACT ID : 060519-801
 LETTING DATE : 05/19/06 10:00 a.m. DISTRICT : 08
 CONTRACT DESCRIPTION : RURAL ROUTE
 CONTRACT TIME : 05/20/08 COMPLETION DATE

RANK	VENDOR NO./NAME	TOTAL BID	% OVER LOW BID
1	0010381 McAninch Corporation	\$ 27,216,973.57	100.0000%
2	0010524 W. A. Ellis Construction Co.	\$ 27,645,273.07	101.5736%
3	0010189 Illinois Valley Paving Co.	\$ 28,700,321.94	105.4501%
4	0010207 Koss Construction Company	\$ 29,714,819.07	109.1775%

ACTUAL BIDS →
 RECEIVED