



# MEMORANDUM

## Missouri Department of Transportation Administration Central District

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**TO:** Joseph Jones  
Engineering Policy Administrator

**FROM:** Nicole Kolb Hood  
Transportation Project Manager

**DATE:** December 5, 2008

**SUBJECT:** Camden County, Route 5 and Route 54  
Job No. J5P0309J  
Practical Design 2009 Awards for Excellence

We are submitting the above noted project for the 2009 Practical Design Awards for Excellence. This project included a practical and innovative approach for stream mitigation on the Route 5 and Route 54 projects. It also included a practical approach towards the design of the crossings.

The continuing and increasing need for stream mitigation to offset impacts from highway construction prompted MoDOT to seek out stream bank restoration projects to provide greater benefits to stream habitat than smaller less beneficial stream projects, thereby increasing the amount of mitigation credits available. Low water crossings on Missouri county roads can limit aquatic organism movement because they create jump and velocity barriers. Modifications of these structures enable fish populations to reconnect, increasing opportunity for genetic diversity and boosting population growth. Modifications also improve sediment transport and minimize continuing maintenance costs.

Until this project, there was no accepted methodology to calculate the amount of stream mitigation credit received by modifying low water crossings. Development of the survey methodology was a collaborative effort between MoDOT and the Missouri Department of Conservation (MDC) resulting in a framework of credit calculation for all future low water crossing improvement projects. Collaboration was also necessary to gain approval of the survey methodology by all five Missouri Corps Districts, Region 7 EPA, the MDC, US Fish and Wildlife Service-Region 3, and Missouri Department of Natural Resources. This is the first MoDOT Stream Mitigation Bank approved by the regulatory/resource agencies. It is an innovative approach that demonstrates MoDOT's commitment to quality stream mitigation projects, and provides the methodology for anyone in the state needing to mitigate for stream impacts.

Completion of this project results in a significant cost savings for MoDOT. If MoDOT purchased an equivalent amount of credits from the in-lieu fee program, as compared to those generated from the low water crossing modifications, it would result in an expenditure of approximately \$2.7 million. Completion of the crossing modifications will cost us \$562,000 to construct, whereas a contribution to the in-lieu fee program for project specific stream mitigation for two corridor projects that are underway would cost MoDOT \$1.5 million. Project specific

savings for use of the Stream Mitigation Bank amounts to approximately \$1 million. In addition, there will be remaining credits for use on future projects. In general, the cost for MoDOT to purchase the same amount of credits as those generated by modification of these crossings is over \$2.0 million dollars, money that can be put back into the road system.

This project saves MoDOT time and should further simplify the permitting process. The execution of the Banking instrument for this type of mitigation streamlines MoDOT's stream mitigation process by having bank credits available for use, and not having to expend man hours locating, securing, and designing project specific mitigation for future projects. Establishment of the Bank ensures that the process required for future mitigation is significantly simplified, which should aid in more timely reviews and approvals by the Corps of Engineers. By consolidating efforts into one bank proposal, future mitigation needs will be met and individual mitigation project needs requiring multidisciplinary input (i.e. survey, r/w, design, etc.) will be avoided. MoDOT is also using a unique design proposal to rehab the existing structure and re-use as much of the material that is removed to install two 30-foot opening spans. The new section with the two 30-foot spans will tie into the existing county road.

Safety improvement is another noteworthy component of this project. The crossings are located on county roads; therefore, we secured a county agreement to enable our work on the crossings. The agreement allows MoDOT to temporarily take the crossings into our system, construct the projects, and then transfer them back to the county once construction is complete. By taking this approach, MoDOT will not be obligated to own or maintain these structures. The new structures will have larger openings and wider widths. In addition, the deck elevation for two of the three crossings will be constructed at higher elevations than the existing structures. These types of design modifications will act to decrease the duration and frequency of flood events, thus increasing the safety component for vehicular traffic.

In addition to being an innovative process for stream mitigation, this project also includes a practical approach to the design of the crossings. In the past, MoDOT would build a bridge for a 100- year flood event. This would require a 300' long structure with 26' roadway width and would cost about \$1.8 million for bridges. With a practical design, we were able to save taxpayer's money over \$1.5M of the project cost. In addition, we received 74,000 mitigation credits when this project is completed. How did we accomplish it? We kept the existing roadway alignment. We provided a minimal structure opening so that a new structure length would be as short as possible. Width of a new structure is about 17', slightly wider than existing roadway. There is no rail or safety barrier curb on a new structure because there is none on existing crossing and a county engineer did not want to have a curb. Total length of a structure is about 62' long. New structures will significantly improve water flow at each crossing so that local residents, mail carriers and school buses can use them more often during raining season. We worked with a county engineer to improve a safety by fixing a poor roadway alignment. We also allowed a contractor to recycle old concrete on-site as roadway base and rock blankets. We kept both preliminary and final designs in-house.

Team Players - Worked and collaborated with county commissioner/engineer, Dept. of Conversation, US Fish and Wildlife Service, Corp of Engineers, etc.

Benefits – 1) Save endangered fish and wildlife 2) County has new structures 3) Received 74,000 mitigation credits 4) Saved over a million dollar on construction cost 5) worked with many keyed entities.

# Practical Design



# 2009 Awards for Excellence



ACEC  
Missouri

AMERICAN COUNCIL OF ENGINEERING  
COMPANIES of Missouri

# Practical Design

## 2009 Awards for Excellence

In the face of today's market volatility, increasing public demand and decreasing revenue, state DOTs must deliver the transportation system better, faster and cheaper than ever before. MoDOT's Practical Design effort accomplishes that goal by building "good" projects everywhere instead of "perfect" projects somewhere.

Innovation and creativity are the keys to accomplishing Practical Design. MoDOT, partnering with the American Council of Engineering Companies of Missouri (ACEC-MO), recognizes project teams that challenge traditional engineering standards to efficiently solve today's transportation needs.

The 2009 Awards for Excellence in Practical Design provide an opportunity for MoDOT, consultant firms, and (for the first year) contractors to compete head-to-head for statewide recognition on MoDOT projects. Cities and counties are also able to compete in an "Off system" Category.

### RECOGNITION

Winners will be recognized during the annual TEAM Conference in Branson. Additionally, individual submittals will have the opportunity to be 'showcased' at the meeting.

### ELIGIBILITY

- MoDOT, consultant engineering firms, and contractors (needn't be ACEC or AGC member, respectively) having designs completed or started after January 1, 2006 may compete in the MoDOT project categories. Cities, counties and their consulting firms having designs completed or started after January 1, 2006 may compete in the Off-System category. Any MoDOT division with practical design initiatives implemented after January 1, 2006 may compete in the Non-Project category.
- Projects must have been awarded prior to the submittal deadline.
- Projects that won in a previous year are not eligible.

### GENERAL CRITERIA

1. Entries must be submitted in accordance with the rules and requirements in this brochure.
2. Submittal must be a Missouri project.
3. The category under which an entry is submitted may not necessarily be the same under which it is judged. The Judges reserve the right to re-categorize projects to ensure even competition.
4. **Categories** will consist of the following:
  - Small Project (generally under \$10M budget)
  - Large Project (generally over \$10 M budget)
  - Post-Design Solution (ATC or VECP)
  - Process Improvement
  - Off System Project
  - Chief Engineer's Award

*Note: The Chief Engineer's Award will be selected from among all of the entries. Please do not submit an entry under this category.*
5. **Submittal:** One .pdf file (10 Mb maximum) containing the following items:
  - Cover letter/Summary (2 pages maximum)
  - Completed 2009 Application Form
  - Backup, Plans, etc. – Five pages maximum
  - Minimum of one, maximum of five pertinent photograph(s)  
All information submitted should be project specific and not general firm information.
6. **Judges:**
  - ACEC Member
  - MoDOT Official(s)
  - FHWA Official
  - City or County Official
  - Contractor Professional
7. **Publicity:** All winners will be highlighted in MoDOT's *Connections* monthly newspaper and on MoDOT's Web site, ACEC's newsletters and Web site, on the TEAM Web site, and through various news releases following the TEAM meeting. Further benefits may be gained through features presented in firms' brochures, newsletters or other print or broadcast media.
8. The 2009 Awards for Excellence in Practical Design Committee reserves the right to determine the eligibility and category classification for all entries.
9. **Awards:** Awards are presented at the 2009 TEAM Conference.
10. **Ratings Guidelines:** Entries will be judged with respect to the following categories:

Project-Based Submittals	Process Improvement Submittals
<ul style="list-style-type: none"><li>• Submittal</li><li>• Cost Savings</li><li>• Innovation</li><li>• Amount of Improvement</li></ul>	<ul style="list-style-type: none"><li>• Submittal</li><li>• Cost Savings</li><li>• Improvement in Business Efficiency</li><li>• Improvement of end Result</li></ul>

**All entries must be received no later than close of business on December 1, 2008.**

# 2009 APPLICATION FORM

(required for each entry)

Complete this section for (check one):  **Small Project**  **Large Project**  
 **Post-Design Solution**  **Off System Project**

**Job No.** J5P0309J **Route** Co Rd N-166R **County / LPA** Camden

**Description** (attach separate sheet if necessary) This project involved modifications to three low water crossings on Camden County roads that cross the Little Nianqua River. The modifications were made to mitigate environmental impacts for the Route 5 and Route 54 projects. (see attached brochure)

Complete this section for: **Process Improvement**

**Process or Product** \_\_\_\_\_

**Description** (attach separate sheet if necessary) \_\_\_\_\_

**Project Leader** Nicole Hood

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

<u>Melissa Scheperle</u>	<u>Robert Jany</u>	<u>Anousone Arounpradith</u>
<u>Wayne V. Elliott</u>	<u>Travis Stump</u>	<u>Gabriel Schubert</u>
<u>Nikolas Schaffner</u>	<u>Kristin Gerber</u>	<u>Steven Engelbrecht</u>
<u>Timothy Redmond</u>		

**Project Budget:**

**Initial Cost / Estimate** Bridges \$345,000, \$438,000 including roadway

**Final Cost / Award** \$ Bridges \$349,486, \$562,000 including roadway

**(Bridges would cost \$1.8M without a practical design)**

**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)

In addition to being an innovative process for stream mitigation, this project also includes a practical approach to the design of the crossings. Overall Benefits – 1) Save endangered fish and wildlife 2) County has new structures 3) Received 74,000 mitigation credits 4) Saved over a million dollar on construction cost 5) worked with many keyed entities.

**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**

## Low-Water Crossing Mitigation

Missouri Department of Transportation

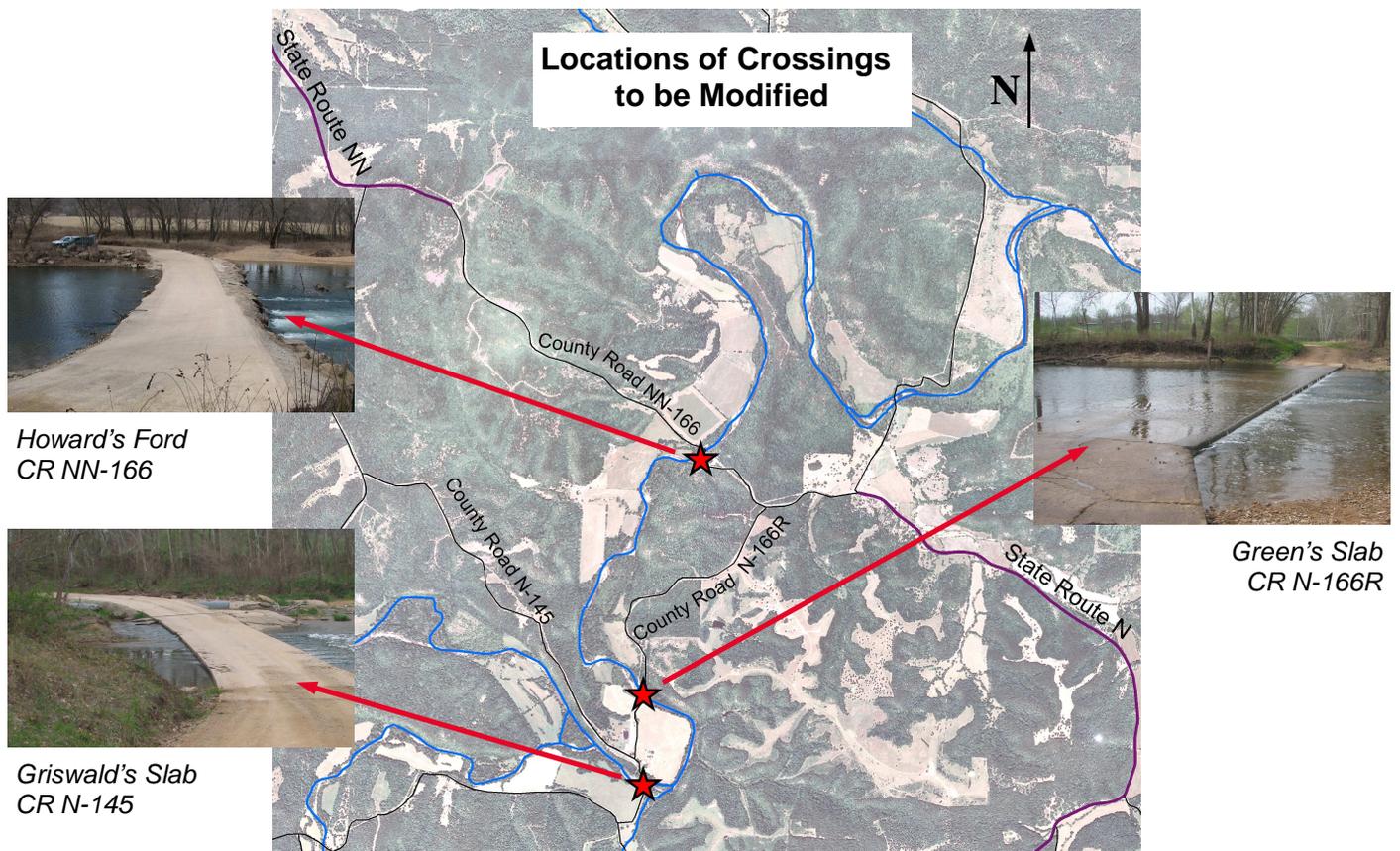
June 2008

### Modifications To Low-Water Crossings Planned As Part of Federal Stream Mitigation Requirements

The Missouri Highways and Transportation Commission plans to modify three low-water crossings on Camden county roads that cross the Little Niangua River. Modifications will allow for increased water flow through the crossings and improved fish migration upstream and downstream of each road crossing. This will also increase the habitat range of the threatened Niangua darter.

The crossings are at **Howard's Ford on County Road NN-166**, **Griswald's Slab on County Road N-145** and **Green's Slab on County Road N-166R**.

Improvements to crossings like these are required of MoDOT by federal law to address and mitigate environmental impacts made during state highway projects. MoDOT has been working with the Camden County Commission on this project and they are supportive of this improvement.



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## Low-Water Crossing Modifications—Project Details

The work will include removing and replacing 60 feet of each of the existing low-water crossings where flow is the greatest. **Griswald's Slab** will be raised one foot and **Green's Slab** will be raised two feet. **Howard's Ford** will remain at the same elevation. The new crossings will be 17-foot wide, which is three feet wider than the existing crossings.



*Example of a modified crossing*

In addition to improving area environmental impacts, the modifications will also reduce maintenance needs of the structures and reduce the frequency of flooding.

The project will be available for contractor bids in late July 2008. Modifications could begin in summer 2008 and will require closing the crossings during the work. Alternate routes around the crossings are available.

The modifications will be completed by the end of the year.

## Contact Information

If you have questions or comments about this work, please contact the Missouri Department of Transportation's Customer Service Center at 1-888-ASK-MoDOT (275-6636) or [www.modot.org/central](http://www.modot.org/central). A representative will be happy to assist you and/or put you in contact with a member of the project team.





