Missouri
Department
of Transportation

MoDOT

Kevin Keith, Interim Director

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August 2, 2010

Dear Research Partner:

The Missouri Highways and Transportation Commission requests proposals from qualified organizations—namely private consultants, universities, and research organizations—to furnish services as described in the following attachment, to be coordinated by the Organizational Results (OR) unit.

Please submit a proposal for project TRyy1103 entitled, "Self-Consolidating Concrete for Infrastructure Elements." Your submittal must include a work plan, the proposed project team and its background, and any related projects now active or recently completed by your firm.

The selection committee will use Qualification Based Selection. A "not to exceed" budget amount is included in the RFP to assist with the required scope, but budgets are not to be included with the proposal submissions, and will not be presented to the selection committee.

Please deliver all proposals to the OR Contract Administrator indicated in the attachment by **September 7, 2010.** More information about project contracting in general can be found at: www.modot.mo.gov/services/OR/orRFP.htm

Sincerely,

Mara Campbell
Organizational Results Director

Attachment

Request For Proposals (RFP)
Project Specific Requirements:

This document contains information and requirements for only this RFP. A "Standard Requirements" document contains additional needs for all research proposals and contracting. Submitters should review both this document and the Standard Requirements document, available from the OR Contract Administrator (identified at the end of this document) or:
www.modot.org/services/OR/orTemplates.htm

TRyy1103
Self-Consolidating Concrete for Infrastructure Elements

Project duration: 18 months
Project budget: Not to exceed $120,000

Background:

Self-Consolidating Concrete (SCC) can be beneficial due to the highly fluid nature of the concrete prior to hardening. The fluid properties eliminate the need for vibration as well as give it a unique ability to flow around congested steel areas without segregating. The precast industry has shown an interest in using SCC mixtures on MoDOT projects; however there are still unanswered questions about the hardened properties of the concrete. Previous research on SCC has indicated that the materials used can have a significant effect on the finished product. A few research studies have also reported that there can be issues with the shear strength of SCC, another indication that there can be variations in the performance of SCC elements due to mix designs and material properties. MoDOT feels that it is important to test SCC mixes using Missouri aggregates prior to allowing wide-scale use on infrastructure elements such as prestressed bridge girders, drilled shafts, columns, retaining walls, congested steel areas, etc.

Objectives:

The objective of this study is to investigate the hardened properties of SCC concrete, including but not limited to: shear strength, creep, shrinkage, bond development length, air content, permeability, Modulus of Elasticity, compressive strength, freeze/thaw durability (AASHTO T161), air void system (ASTM C457), and stability. All efforts should be made to obtain actual mix designs from Missouri precast suppliers with assurance that proprietary information will be confidential and actual mix designs will not be released to anyone outside the project team. Both typical and high strength mix designs should be tested since preliminary research has indicated that high strength concrete can be a factor in reduced shear strength. AASHTO LRFD Bridge Design Specifications may be used for concrete strengths up to 10 ksi. Greater concrete strengths may be used with testing according to AASHTO LRFD. Coordination may be required with precasters on determining fixed initial and final values of concrete strength for prestressed girders.

Project Requirements and Deliverables:

The Offeror will provide a proposed work plan to meet the above research objectives and the following tasks and deliverables. Task descriptions are intended to provide guidance in development of the research. MoDOT is seeking the input of proposers to determine the best strategies to accomplish the research objectives.

Task 1: Literature Review: The literature review should include current research and concentrate on the hardened properties of SCC mixes, changes in properties due to materials used, and shear concerns.

Task 2: Obtain mix designs from precast suppliers if possible. Both typical and high strength designs should be developed. All information from precast suppliers must remain confidential. The influence of different cementitious materials and admixtures should be considered on both the workability and hardened properties of SCC.

Task 3: Evaluate slippage/pullout of both prestressing strands and epoxy bars. MoDOT has a draft specification which requires the Moustafa Method as prescribed by the Precast/Prestressed Concrete Institute, but the researcher should review other methods to determine slippage/pullout and make a recommendation to what MoDOT should specify.

Task 4: Determine the hardened properties of SCC with Missouri aggregates including, but not limited to: shear strength, creep, shrinkage, bond development length, air content, permeability, Modulus of Elasticity, compressive strength, freeze/thaw durability (AASHTO T161), air void system (ASTM C457), and stability. Maximum and minimum values should be reported. Recommendations should be made for any changes that would be required for designing precast/prestressed girders with SCC. Girder design requirements can be found on MoDOT's website in the EPG section 700 at http://epg.modot.org/index.php?title=Main_Page

Task 5: Determine the shear properties of each concrete design mix including but not limited to: overall shear contribution of SCC, shear contribution from aggregate interlock, shear contribution from steel, influence of concrete shear contribution for moderate to high strength concrete strength designs, and influence of aggregate size.

Task 6: Develop recommendations for specifications and implementation of SCC. NCHRP 628 has sample specifications and guidelines which should be used as a guide. MoDOT has a draft special provision for SCC which can be used as reference.

Task 7: Determine a "value" for MoDOT implementing the research.

Deliverables:

> Quarterly Reports: Quarterly reports are required on December 20th, March 20th, June 20th, and September 20th during the project.
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> Interim Presentation: An interim presentation should be scheduled near the mid-point of the project to update MoDOT on the progress and direction of the project. This is in

addition to the necessary communication between the Principal Investigator(s) and MoDOT contacts throughout the project.

Draft Report, Draft Specification & presentation: The draft report and draft specification are due 1 month prior to the final report. The draft report is intended to be a review of the final report product. A presentation should be made to MoDOT regarding the draft report and project findings.

Final Report & Final Specification: A final report date and final specification date will be set when the contract start date is determined. It will be 18 months after the start of the project.

Project Schedule:

The following is an estimate of the project timeline or information on key dates within the project, presuming the project starts on October 15, 2010. Proposals need to include a work plan with a proposed timeline. While alternative timelines will be considered, an extension is unlikely. The project timeline will be finalized during the contracting phase.

December 20, 2010: Quarterly report is due

March 20, 2011: Quarterly report is due

June 20, 2011: Quarterly report is due

July, 2011: Interim presentation should be coordinated with project team and MoDOT contacts

September 20, 2011: Quarterly report is due

December 20, 2011: Quarterly report is due

March 15, 2012: Draft Final Report is due (exact date will be stated in final work plan during the contracting phase.)

March 15, 2012: Draft specification is due (exact date will be stated in final work plan during the contracting phase.)

March 12-22, 2012: A presentation should be coordinated with project team and MoDOT contacts.

April 5, 2012: Review of drafts will be completed. The time between review and next due date is to allow for final changes and formatting.

April 16, 2012: Final Report and final specification is due (exact date will be stated in final work plan during the contracting phase.) The final report must have the standard documentation form completed and should have sections consistent with the typical research report.

April 16, 2012: A technical memo is required with a simple listing of results from the research, a list of recommendations based on the list, and a preliminary list of ideas to implement the recommendations.

May 15, 2012: Final invoice is due

May 30, 2012: Contract ends

(For report templates and a standard form see: www.modot.org/services/OR/orTemplates.htm.)

Special Notes:

Project budget is not to exceed $120,000. A budget is **not** to be included in the proposal, but will be required for the contract and must be within this limit.

Reporting templates and standard report forms are available from the OR Contract Administrator or the web site: www.modot.org/services/OR/orTemplates.htm

RFP Requirements:

- Proposals must be no more than 10 pages with a font size no less than 11 points. This length limit does not include forms or resumes attached to the proposal.

- The "Standard Requirements" document provides further details and links to the required forms. It is available from the OR Contract Administrator or at: www.modot.org/services/OR/orTemplates.htm

- Proposals will be evaluated by an agency and stakeholder team with knowledge and backgrounds in relevant areas for this project. Selection of the successful proposer will be based on the proposer's demonstrated knowledge in the required areas, the merit of the proposed methods and approach in achieving the desired goals, the experience and qualifications of the team, the plan for ensuring implementation of results, and the adequacy and availability of team members to complete the work in a timely manner.

RFP Schedule:

The following timeline must be met for a proposal to be accepted.

Date:	**Action:**
August 2, 2010	MoDOT posts RFP to the website: www.modot.mo.gov/services/OR/orRFP.htm
August 18, 2010	Written comments or questions must be submitted to OR Contract Administrator.
August 27, 2010	MoDOT will post written responses publicly on the website: www.modot.mo.gov/services/OR/orRFP.htm

September 7, 2010	Written proposals must be submitted to OR Contract Administrator.
September 22, 2010	MoDOT will notify submitters about project selection, or if needed about interviews to finalize selection.

Contracting Requirements:

- The successful team will be required to complete additional documentation and enter into a contract such as a "Standard Research Agreement" or "Task Order." Applicants should be aware of these additional needs so contracting can proceed in a timely manner.

- Standard contracts, forms, attachment templates and additional information are available from the OR Contract Administrator or the web site:
  www.modot.org/services/OR/orTemplates.htm

Contact Information:

Proposals must be either hand delivered by close of business; or faxed, emailed, or mailed by midnight (Central Standard Time) according to time stamp or postmark; on the due date indicated below. Please reference the project title since more than one RFP may be due at one time. Electronic proposals are encouraged. They may be faxed or emailed to the OR Contract Administrator:

Karmen.Stockman@modot.mo.gov
Fax: 573 526-4324

Proposal packages suitable for duplicating may be submitted by mail or hand delivery to:

Organizational Results Contract Administrator
Missouri Department of Transportation
2217 St. Mary's Boulevard, West
PO Box 270
Jefferson City, MO 65109