MoDOT

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Missouri Department of Transportation
Patrick K. McKenna, Director

1.888.ASK MODOT (275.6636)

November 18, 2019

Dear Research Partner:

The Missouri Highways and Transportation Commission requests proposals from qualified organizations—namely private consultants, universities, and research organizations—to furnish professional services as described in the following request for proposal to be coordinated by the Research Unit of the Construction and Materials Division.

Please submit a proposal for project **TR202017** entitled, **"Scour Analysis at Missouri Bridges"** 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 project team must be led by a licensed professional engineer in the state of Missouri and the final report must be sealed, in accordance with the provisions of Chapter 327 RSMo.

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 submit all proposals to MoDOTResearchRFP@modot.mo.gov by **January 9, 2020 10:00 AM (CST)**. More information about project contracting in general can be found at https://www.modot.org/information-researchers under RFP documents.

Sincerely,

Jen Harper
Research Director

Background

Missouri has over 10,000 bridges on the state system and almost another 15,000 on local roadways. For bridges over waterways scour can be a concern. Variables affecting the severity of scour include: structure foundation type, geometry of the waterway and structure, type of streambed material and velocity of the water. The leading cause of bridge failure nationwide is scour; bridges that are susceptible to structural damage, or failure from, scour are listed as "scour critical" bridges. Scour analysis has typically been based off of a single soil sample taken from the streambed used with hydraulic data developed using a 1 dimensional hydraulic model.

In the late 1990s MoDOT had a consultant perform a scour analysis on a number of bridges that had a high potential of being "scour critical" using Water-Surface PROfile (WSPRO) modeling to determine the hydraulic data. MoDOT would like to have a sampling of these bridges re-studied to evaluate the validity of the original scour analysis.

MoDOT will work in conjunction with the research team to determine the final list of bridges to be a representative sampling of "scour critical" bridges on the state system. The research team should provide as part of their proposal the number of bridges they can evaluate within the (not-to-exceed) budget. Site-specific testing on the soil and rock at the selected bridges will be required for the project along with the use of two hydraulic modeling programs; HEC-RAS for one-dimensional analysis and SMS/SRH-2D for two-dimensional analysis.

Objectives

The main objectives of the project are:

1. Provide methodology used to determine soil/rock sampling locations and depths, and the soil sampling and testing methods used.
2. Comparison of the scour analysis results using HEC-RAS (1D) hydraulic modeling data to results using SMS/SHR-2D hydraulic modeling data using the sampling methodology employed for this study.
3. Comparison of the scour analysis developed in objective number 2 to the current analysis method of using a single soil sample from the stream bed, and to the existing scour analysis results developed using WSPRO hydraulic model data. MoDOT will provide the scour reports that were developed using WSPRO data.
4. Risk assessment, due to scour, for the bridges studied by the project.

Project Requirements

Task 1: Project Management

The contractor will facilitate a kick-off meeting with MoDOT to review the work plan, scope and schedule; and establish a protocol for regular ongoing communications and coordination with the team.

The finalized work plan will detail implementation of the following tasks as well as the resources and schedule required to carry them out.

Task 2: Develop list of bridges for analysis

The research team will select and recommend the list of bridges for analysis. The final list will be determined based on discussions with the MoDOT technical panel. The research team should include in their submitted proposal the number of bridges they will evaluate based on the not-to-exceed amount of the project. This amount is listed under the "Special Notes" section.

Task 3: Perform site-specific testing of the soils and rock

The research team should list the suggested tests for the site specific testing in their research proposal. For on-site testing, the chosen research team will need to work with MoDOT to schedule the site visits so that any required traffic control or public communication can take place. All MoDOT safety requirements must be followed.

Task 4: Perform 1D and 2D hydraulic modeling of bridges

HEC-RAS (1D) and SMS/SHR-2D are the computer modeling programs used by MoDOT and should be used in this study. A 100-year, 500-year and roadway overtopping flood analysis should be conducted. MoDOT can provide LiDAR data for most sites if it is not publically available.

Task 5: Analyze scour and compare results

Analyze scour and compare the results from the sampling methodology used for the study, and the current single sample methodology, using data from the 1D and 2D hydraulic modeling. These results should also be compared to the existing scour analysis results that used WSPRO hydraulic data.

Task 6: Delivery of Final Report, Research Summary, Hydraulic Models, Scour Calculation and Data Collected.

The contractor will develop a final report detailing the tasks completed during the project including any and all findings generated during the project's duration. The contractor will provide a 1-2 page research summary that states the project objectives and includes information on project conclusions. The hydraulic models, calculations and data collected shall be provided at the conclusion of the project in a format that is usable and documented. A presentation for MoDOT staff, summarizing important or significant details of the project, may also be required.

Project Deliverables

For templates and forms for reports and plans, visit https://www.modot.org/information-researchers.

Email Communications

E-mail and phone communications between the Principal Investigator(s) and MoDOT contacts as necessary are required to provide on-going updates of progress throughout the project

Data Management Plan

The plan is a formal document that describes the data that is acquired, created or produced during the project, specifies who owns it and who can access it as well as information on how it will be described, managed, analyzed, stored, shared and preserved during and after the project is over. Please refer to templates on the website.

Quarterly Reports

Quarterly reports should be submitted throughout the project on the last day of March, June, September and December. The quarterly reports are not intended to replace any additional correspondence between the research team and MoDOT needed to keep the project moving. Please refer to template on the website.

Interim Presentation

An interim presentation shall be scheduled near the mid-point of the project to update MoDOT on the progress and the direction of the project. The purpose of the interim presentation is to evaluate the progress and determine if any mid-project corrections are necessary.

Draft Final Report and Research Summary

These drafts should be final products except for revisions based on MoDOT's review. A final report must include a completed Technical Report Documentation page. Please refer to **Publication Guidelines** and summary template on the website.

Final Report and Final Research Summary

After MoDOT's review is complete and documents have been edited to MoDOT's satisfaction, final documents should be submitted as Word documents (unless otherwise instructed). Please refer to **Publication Guidelines** and summary template on the website.

Other Deliverables

The hydraulic models, data, and calculations shall be provided to MoDOT at the conclusion of the project. The data must be in a format that is understandable including definitions for any variables, column headers and rows.

Final Presentation

May be required. The contractor will present the results, recommendations, and implementation ideas to MoDOT and other stakeholders. For stakeholder and agency participants, any travel

and lodging fees are to be covered by individual attendees or their firms. MoDOT and stakeholders will provide feedback to the contractor, especially related to implementation.

Task-Specific Deliverables

Task	Deliverables
1	Schedule and conduct kickoff meeting. Kickoff meeting minutes. Draft and final work plans. Formation of Technical Advisory Committee (TAC).
2	Recommended list of bridges for evaluation. Once the final list is agreed upon, recommendations for dates of bridge field visits for testing.
3	Methodology used to determine soil/rock sampling locations and depth Sampling and testing methods
4	None
5	None
6	Final report and research summary. Hydraulic models, data, and calculations. Possible presentation. Final project meeting.

Project Schedule

The following is an estimate of the project timeline or information on key dates within the project, presuming the project starts **February 15, 2020** Proposals need to include a work plan with a proposed timeline. For a sample of a work plan template, see link below. Changes to our estimated project timeline below will be considered, however, timeline extensions cannot be guaranteed. The project timeline will be discussed and finalized during the kickoff meeting.

For report templates and forms, visit https://www.modot.org/information-researchers.

Date	Milestone
2/28/2020	A kick off meeting with MoDOT will be scheduled to discuss project requirements and deliverables by this date. The dates of key milestones and deliverables will be determined from this meeting.
3/31/2020	First Quarterly Report due, these should be completed the last day of each quarter
2/15/2021	Interim presentation must be done by this date.
2/1/2022	Draft final report, research summary, hydraulic models, scour calculation and project data are due. The draft documents shall be submitted to MoDOT approximately two months prior to the final report.

Date	Milestone
4/1/2022	Final report, research summary, hydraulic models, scour calculation and project data are due. The final documents shall be due approximately one month before the end of the contract. This is to allow all billing to be completed prior to the end of the project.
5/2/2022	Final invoice due and contract ends

Special Notes

Project budget is not to exceed **$200,000.** A budget is not to be included in the proposal, but will be required for the contract and must be within this limit. For a sample Budget template, report templates and forms, see https://www.modot.org/information-researchers.

RFP Requirements

- "Contracting Documents" provide further details and links to the required forms. They are available at https://www.modot.org/information-researchers.
    - **Organization's Project Experience**: The proposal must clearly identify the Organization's experience in offering the services requested in this RFP during the past three (3) years. The description should include a list of the agencies which your organization has served during this time period or currently serves. Please highlight any work you have done with other state agencies or local governments.
    - **Team Member Experience**: Please list all team members (including subcontractors) proposed to work on the project. Attach licenses, certifications and resumes for key personnel.
    - **Organization's Client References**: Proposals should indicate the name, title, and telephone number of at least three clients within the past three years.
- Proposals must be no more than **10** pages in length with a font size no less than 11 points. This length limit **does not include** the Proposal Submission Form, Organization's Project Experience, Team Member Experience, Organization's Client References and optional cover letter (if included, one page maximum).
- Proposals must be submitted as one combined PDF document. The submission should **only include the required documents** organized in the following order: 1) Proposal Submission Form; 2) Cover Letter (Optional; 1 page maximum); 3) Body of Proposal (including work plan); 4) Organization's Project Experience; 5) Team Member Experience; and 6) Organization's Client References.
- The Offeror must respond to this RFP by submitting all the information required herein for its proposal to be evaluated and considered for award. Failure to submit all the required information shall be deemed sufficient cause for disqualification of a proposal from consideration.
- Proposals will be evaluated by an agency and stakeholder team with knowledge and backgrounds in relevant areas for this project. Selection of the successful Offeror will be based on the Offeror'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.

- Correct proposal submission is one of the evaluation criteria. If submission instructions in this section are not followed, the **Offeror risks an automatic 10 point deduction (out of 100 total points)** when points are awarded during the Proposal Evaluation Process.

RFP Schedule

This document constitutes an RFP from qualified organizations to conduct the TR202017 "Scour Analysis at Missouri Bridges" study for the MHTC and Missouri Department of Transportation (MoDOT). MHTC reserves the right to reject any and all proposals for any reason whatsoever.

The following RFP Schedule of Events represents MoDOT's best estimate of the schedule that shall be followed. The time of day for the following events shall be between 7:30 am and 4:00 pm, Central Standard Time unless otherwise noted. MoDOT reserves the right at its sole discretion to expand this schedule, as it deems necessary, without any notification except for the deadline date for submitting a proposal. Time is of the essence for responding to the RFP within the submission deadlines.

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

Date	Action
11/18/2019	MoDOT posts RFP to the website at https://www.modot.org/research-requests-proposal.
12/10/2019 4:00 PM (CST)	Written comments or questions must be submitted to MoDOTResearchRFP@modot.mo.gov.
12/17/2019	MoDOT will post written responses publicly on the website at https://www.modot.org/research-requests-proposal.
1/9/2020 10:00 AM (CST)	Written proposals must be submitted to MoDOTResearchRFP@modot.mo.gov.
1/31/2020	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.

As part of the eAgreements process, MoDOT uses an electronic signature tool, DocuSign, for signing agreements electronically. All parties of the agreement must agree to sign electronically in order to utilize the electronic signature option. If your proposal is selected, you will be informed about how to obtain your credentials for electronic signatures (including how to become a MoDOT vendor if you are not already).

Standard contracts, forms, attachment templates and additional information are available from the website at https://www.modot.org/information-researchers.

Proposal Submission

Submission Deadline

Proposals must be emailed by **10:00 AM (Central Standard Time)** according to email time stamp by the submission date in the RFP Schedule to the Research Director's attention (Jen Harper) at: MoDOTResearchRFP@modot.mo.gov. Please reference the project title since more than one RFP may be due at one time. Electronic proposals are required.

Submission Confirmation

You will receive an email confirmation after your proposal has been received. If you do not receive such a confirmation by **12noon (Central Standard Time)** on the day of the deadline, please contact us at MoDOTResearchRFP@modot.mo.gov as soon as possible. Your submission should not be considered received until you have received your email confirmation.