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Missouri Department of Transportation
Patrick K. McKenna, Director

1.888.ASK MODOT (275.6636)

August 29, 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 **TR202005** entitled, “**Evaluation of Alternatives to Calcined Bauxite for Use in HFST**”. 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 **October 17, 2019 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 Administrative Engineer



Our mission is to provide a world-class transportation system that is safe, innovative, reliable and dedicated to a prosperous Missouri.

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Background

Maintaining the appropriate amount of pavement friction is critical for safe driving. High friction surface treatment (HFST) can enhance the ability of a road surface to provide pavement friction to vehicles in critical braking or cornering maneuvers. MoDOT has used HFST since 2013 to restore pavement surface friction where traffic has worn down pavement surface aggregates and also to improve wet crash locations.

High friction surface treatments place a thin layer of specially engineered, durable high friction aggregates as a topping on a thermosetting polymer resin binder—usually polymeric, modified polyester or urethane. The resin or polymer binder combination locks the aggregate firmly in place, creating an extremely rough, hard durable surface capable of withstanding everyday roadway demands such as heavy braking and even snowplowing.

Aggregates used in HFST, by definition, have a higher polished stone value (PSV). This is a laboratory test that measures the friction value after wear from an abrasive wheel. Although several aggregates have been evaluated, only calcined bauxite aggregate has met the threshold for performance necessary to be called a HFST. Currently, calcined bauxite is the primary aggregate used for HFST in Missouri. Calcined bauxite has very limited sources, which makes it more expensive than locally available aggregates.

The objective of this study is to identify and compare alternatives to calcined bauxite through testing and laboratory evaluation.

Objectives

The contractor will acquire comparable quality aggregates to calcined bauxite that will meet or compare with the MoDOT HFST aggregate criteria. A quality comparison will be done using laboratory testing following MoDOT's (NJSP-15-13B) criteria along with various other tests included in this study.

NJSP-15-13B

Property	Test Method	Requirement
Resistance to Degradation	AASTHO T-96	20% max.
Aggregate Grading	AASHTO T-27	No. 4 Percent Passing 100% min. No. 6 Percent Passing 95% min. No. 16 Percent Passing 5% max.
Moisture Content	AASHTO T-255	0.2% max.
Aluminum Oxide	ASTM C-25	87% min.

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: Identify and Acquire Comparable Aggregates

The contractor will acquire calcined bauxite (control aggregate) along with other comparable aggregates.

Examples of aggregates to be tested, but not limited to:

- Calcined bauxite (control)
- Earth Work Solutions "Traction Control"
- Trap rock (porphyry)
- Granite
- Quartz
- Crushed gravel
- Dolomite stone
- Flint chats
- Steel slag

Task 3: Create Material Summary for Evaluation

Create list of materials to be evaluated that includes, but not limited to:

- Producer/supplier of material
- Ledge/formation of material
- Has material ever been used in HFST?
- Cost of material

Task 4: Laboratory Evaluation of Materials

Laboratory tests to be performed include, but are not limited to:

- Specific gravity
- Absorption
- Los Angeles abrasion
- Micro-Deval
- Water-alcohol freeze
- Sodium sulfate soundness
- Uncompacted voids of fine aggregate
- Acid insoluble residue
- Chemical analysis
- Polished stone value

Task 5: Comparative Study using Laboratory Test Results

Compare alternative aggregates test results with calcined bauxite test results looking for any correlation in the aggregates properties.

Analyze test results and corresponding materials to develop a procedure for future screening and testing of potential HFST aggregates.

Make recommendations of potential aggregates that will perform similar to calcined bauxite.

Task 6: Cost Analysis of Aggregates

Formulate a cost analysis of each aggregate type.

Upfront cost must include, but is not limited to:

- Mobilization
- Labor
- Resin-binder
- Cost of obtaining correct gradation of the aggregate and of the aggregate itself.
- Life cycle cost analysis (LCCA)

Task 7: Delivery of Final Report and Research Summary

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 a Word documents (unless otherwise instructed). Please refer to **Publication Guidelines** and summary template on the [website](#).

Final Presentation

May be required. The contractor will present the results, recommendations, and implementation ideas to MoDOT and other stakeholders. The contractor will coordinate location, date, and meeting fees with MoDOT. 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.

Project Schedule

The following is an estimate of the project timeline or information on key dates within the project, presuming the project starts **November 22, 2019**. 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
12/3/2019	A kick off meeting with MoDOT will be scheduled to discuss project requirements and deliverables. The dates of key milestones and deliverables will be determined from this meeting.
6/3/2020	Interim presentation must be done by this date.
12/3/2020	Draft final report, draft summary report, other deliverables are due. The draft documents shall be submitted to MoDOT approximately two months prior to the final report.
2/3/2021	Final report, summary report, presentations, other deliverables 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.
4/2/2021	Final invoice due.
4/2/2021	Contract ends.

Special Notes

Project budget is not to exceed **\$100,000**. 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 **TR202005 Evaluation of Alternatives to Calcined Bauxite for HFST** 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
8/29/2019	MoDOT posts RFP to the website at https://www.modot.org/research-requests-proposal .
9/19/2019 4:00 PM (CST)	Written comments or questions must be submitted to Research Administrative Engineer .
10/3/2019	MoDOT will post written responses publicly on the website at https://www.modot.org/research-requests-proposal .

Date	Action
10/17/2019 10:00 AM (CST)	Written proposals must be submitted to Research Administrative Engineer .
11/1/2019	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 [Research Administrative Engineer](#) or 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 Administrative Engineer's** attention (**Jennifer 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.