



105 West Capitol Avenue  
P.O. Box 270  
Jefferson City, Missouri 65102

Missouri Department of Transportation  
*Patrick K. McKenna, Director*

1.888.ASK MODOT (275.6636)

July 8, 2020

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 **TR202103** entitled, “**Implementing the LWD for MoDOT Construction Acceptance of Unbound Material Layers.**” 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](mailto:MoDOTResearchRFP@modot.mo.gov) by **September 2, 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



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

[www.modot.org](http://www.modot.org)

---

## Background

For numerous years the Missouri Department of Transportation (MoDOT) has relied on the use of the Nuclear Density Gauge (NDG) for quality assurance testing of new highway projects. The NDG is used to find the dry density of compacted unbound materials that make up the foundation of the roadway. MoDOT specifications require a certain percentage of dry density depending on the layer type and location (subgrade, base, embankment). Although the NDG has been used for many years by MoDOT, the department is required to have permits, annual trainings and adhere to all regulations required when owning/using NDGs.

The Lightweight Deflectometer (LWD) is a portable device that can be used to measure the surface modulus of unbound layers directly in the field. MoDOT would like to create standards for the use of the LWD for acceptance of unbound material layers in place of the NDG. In addition, guidance is required for selecting and using a field-worthy moisture measurement device.

Recently MoDOT participated in a pooled fund project with Maryland Department of Transportation ["Standardizing Lightweight Deflectometer Modulus Measurements for Compaction Quality Assurance"](#), the findings from this prior research can be helpful in producing standards for the use of the LWD in Missouri.

MoDOT currently owns three Zorn LWDs. The selected contractor will be allowed to borrow MoDOT's LWD's and shall be returned upon completion of the research project. These three Zorn LWD's shall be utilized in this research project to implement the LWD for construction acceptance of unbound material layers. The use of any other brand LWD for this research will not be allowed. MoDOT has a couple field ovens that can be loaned to the research contractor for use and evaluation but would prefer evaluations of and recommendations for additional automated soil moisture measurement equipment.

MoDOT also owns a Zorn Laboratory Light Weight Deflectometer that is used for target acceptance modulus from 6" proctor mold samples. **MoDOT will provide the lab LWD to be utilized during this project at an accredited facility of the researcher's choice, or a facility that's been approved by MoDOT. All LWDs shall be returned at the completion of this project.**

---

## Objectives

The objective of this project is to develop standards for the implementation of the Zorn LWD for the acceptance of unbound material layers on MoDOT projects by performing laboratory and field measurements. Deliverables from this project will include recommendations of specifications and standards for the use of the LWD along with recommendations on measuring moisture content in the field.

---

## 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 contractor will also develop minutes for the kick-off meeting and any status meetings that may be held during the project.

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: Project Selection**

The contractor will consult with MoDOT on the selection of construction projects to perform field testing using the LWD and moisture content measurement devices.

Testing will be performed on a minimum of four construction sites. The sites selected shall contain different material types, clay, silt, sand, etc.

## **Task 3: Research and Literature Search**

MoDOT recently participated in a pooled fund project with Maryland DOT and the University of Maryland which evaluated LWD and moisture measuring equipment and produced draft standards for use of the LWD. The contractor's research will build on this prior study appropriately modify the draft standards for both laboratory and field LWD measurements of soil modulus.

The contractor would be expected to investigate any further literature required to become knowledgeable of the technology and equipment.

## **Task 4: Laboratory Testing**

The contractor will perform laboratory assessments on the use of the LWD on multiple soil types. MoDOT currently owns three Zorn LWD's, which shall be used in this research.

~~The MoDOT Central Laboratory may also be utilized for this research, along with any lab equipment needed. All work performed in the MoDOT laboratory or equipment used will have to be coordinated with the laboratory's director and staff before starting any work.~~

Due to COVID-19, the MoDOT lab is not accessible to outside visitors. In lieu of access to our laboratory, MoDOT will provide the lab LWD to be utilized during this project at a facility of the researcher's choice. The laboratory used shall be accredited or be approved by MoDOT. All LWDs shall be returned at the completion of this project.

## **Task 5: Field Testing**

Field testing will take place on a minimum of four MoDOT construction sites. Each site shall represent a unique soil and/or base type. The research contractor will have to collaborate with the construction contractors on the exact dates and times of LWD testing and evaluation.

An assessment of the testing data from each construction site will be conducted, the data will be reviewed and interpreted.

## **Task 6: Create Guideline for Use**

The contractor will create guidelines and standards for the implementation and use of LWD testing that MoDOT might follow in future projects. The guideline should be in the format of MoDOT's [Engineering Policy Guide](#).

## **Task 7: Develop Interim Report, Draft Specifications and Standards, and Research Summary**

## **Task 8: Delivery of Final Report, Final Specifications and Standards, 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

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 **September 21, 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   |
|-----------|---|
| 10/1/2020 | 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.  |
| 6/21/2021 | Interim presentation must be done by this date.   |
| 1/21/2022 | 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.   |
| 2/21/2022 | 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. |
| 3/21/2022 | Final invoice due.  |
| 3/21/2022 | Contract ends.  |

---

## Special Notes

Project budget is not to exceed **\$145,000**. 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 **TR202103 “Implementing the LWD for MoDOT Construction Acceptance of Unbound Material Layers”** 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   |
|----------------------------|--|
| 7/8/2020                   | MoDOT posts RFP to the website at <a href="https://www.modot.org/research-requests-proposal">https://www.modot.org/research-requests-proposal</a> .                            |
| 7/28/2020<br>4:00 PM (CST) | Written comments or questions must be submitted to <a href="#">Research Director</a> .   |
| 8/11/2020                  | MoDOT will post written responses publicly on the website at <a href="https://www.modot.org/research-requests-proposal">https://www.modot.org/research-requests-proposal</a> . |
| 9/2/2020<br>10:00 AM (CST) | Written proposals must be submitted to <a href="#">Research Director</a> .   |
| 9/14/2020                  | 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](mailto: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](mailto:MoDOTResearchRFP@modot.mo.gov) as soon as possible. Your submission should not be considered received until you have received your email confirmation.