

**ARKANSAS DEPARTMENT OF TRANSPORTATION
SYSTEM INFORMATION AND RESEARCH DIVISION
FISCAL YEAR 2025
REQUEST FOR PROPOSAL
RESEARCH PROJECT NUMBER TRC2501**

TITLE

TRC2501: Methodology on Establishing Vegetation on Cut Slopes

ARDOT POLICY

All projects must conform to the rules, regulations, policies, and procedures issued by the Federal Highway Administration (FHWA), State of Arkansas regulations, and those of the Arkansas Department of Transportation (ARDOT). Questions on situations and circumstances not adequately addressed herein will be negotiated on a case-by-case basis and done in accordance with FHWA's 23 CFR Part 420, the Basic Agreement, the Research Manual, and all other Department guidelines and policies.

The contracting agency must enter into a Basic Agreement, if none exists, with ARDOT prior to the execution of any Project Agreement.

All research project contracts will be managed utilizing Infotech's Doc Express paperless contracting platform. The selected Principal Investigator and Co-Principal Investigator must have access to Doc Express through their organization's account.

PROBLEM STATEMENT

ARDOT currently does not have a reliable plan for establishing vegetation on cut slopes. There are currently issues with slopes being seeded and reseeded by contractors without vegetation being successfully established and delaying final contract acceptance. Certain areas require native seed mixes, some of which take up to a year to germinate, also delaying final contract acceptance. To prevent erosion and subsequent problems, maintain permit compliance, and avoid costly change orders, a methodology or suite of methodologies should be established to help inform how to establish vegetation and preserve cut slopes in a variety of settings and circumstances.

OBJECTIVE AND SCOPE OF STUDY

The objective of this study is to create a methodology to be used in the preliminary planning and design phases that will:

- Identify factors that could inhibit vegetation growth.

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- Analyze and test problem soils prior to design or during construction.
- Provide widely applicable options to offset growth inhibitors.
- Set parameters that will provide mitigation options based on site specific factors.

Factors to be considered should include but are not limited to:

- Areas where non-native species are prohibited
- Soil analysis
- Seasonal timing of seed application
- Existing vegetation
- Slope grades – designs to limit erosion
- Surface run-on
- The range of climate and physiographic factors across the state
- Cost-effectiveness relative to the standard and special (native-only) seeding specifications

These factors will be taken into consideration in the planning and design phase of each project to maximize success in establishing vegetation after construction, minimize change orders, avert the cost of additional let jobs, and avoid delays in final contract acceptance.

As they have previously been unsuccessful, this project should not include the use of rolled erosion control matting or fabrics. The project should not focus on post-construction slope failure.

METHOD OF STUDY

The project will include, but is not limited to the following tasks:

- Literature reviews to research regional practices for fertilizer, seed, watering requirements, and penalties.
- Survey surrounding states with similar geographical conditions to learn the following:
 - When other DOTs begin planning for vegetation
 - What seed mixes other DOTs use
 - Practices for implementing fertilizer and seed
 - Watering practices

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- Determine potential factors to be considered including, but not limited to:
 - Grade and length of slope face
 - Run-on from adjacent surroundings
 - Soil analysis beyond pH to include at a minimum NPK needs
 - Amount of material removed exposing sterile subsoils and justification for redressing with topsoil
 - Consideration of ecoregion specific issues
 - Develop regional fertilizer and seed mix options.
- Alter structural practices such as the design of cut slopes to limit the erosion on slopes as well as intercept and divert run-on.
- Meet watering requirements based on the type of seed mix used.

POTENTIAL BENEFITS

A detailed benefit-cost analysis will be included in the proposal. The analysis should include, but is not limited to the following:

- Detailed cost analysis on savings to the Department with full implementation of the project findings.
- Any anticipated benefit not foreseen as a cost savings.

TIME AND FUNDING OF STUDY

Work will begin no earlier than July 1, 2024, contingent upon acceptance of the Proposal and availability of research funds. The total length of the project should be expected to be at least 30 months to include testing during the 2025 and 2026 growth cycles and should not exceed 36 months including the Publication Phase. A final report is to be drafted and presented to the Research Project Subcommittee on or before the completion date of the Work Phases of the project. The Publication Phase will be of sufficient length to allow the proper review, comments, and revisions, and will contain funding to accomplish revisions and publication costs. The end of the Publication Phase will be the formal completion date of the project. Up to 25 percent of the estimated project costs will be withheld pending final acceptance of the final report. Failure to deliver the required final report at the end of the project will result in the cancellation of the project, and the Department will retain 25 percent of the total project cost.

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REPORT REQUIREMENTS

All reports must be in accordance with the most current Research Manual (available at <https://www.ardot.gov/divisions/system-information-research/research/> or from the Research Section). All reports must be submitted through Doc Express. All final reports are required to be reviewed by a technical editor before submission to the Department.

Final reports must also be Section 508 compliant. Federally funded research with public-facing PDFs must be accessible as of March 23, 2018, according to the final federal rule for the Information and Communication Technology (ICT) refresh under Section 508. This ensures that federal employees with disabilities have comparable access to and use of information and data just like federal workers without disabilities. The law also ensures that members of the public with disabilities receive comparable access to publicly available information and services. All researchers should use the accessibility tracker in Microsoft Word before submitting final reports.

An oral report to the Transportation Research Committee may be required. In addition to reports and publications, the Department must be furnished one (1) copy of any master's thesis or doctoral dissertation which is a result of any investigation or study on this project. The Department's written approval must be obtained before the publication or presentation of this project before its completion.

PROJECT DELIVERABLES

The project deliverables will include, but not limited to:

- Draft special provisions
- Task level reports – a highlight of the findings at each phase of the project
- Quarterly reports
- Annual benchmark reports
- Final report including implementation

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AUTHORIZATION TO BEGIN WORK

A letter authorizing the beginning of work will be transmitted through Doc Express initiating the project. Any cost incurred before the authorization letter is received will not be eligible for reimbursement. The project will begin work no earlier than July 1, 2024.

EQUIPMENT

A complete physical verification of all software and equipment purchased or built for use on this project and the actual location of the equipment will be made each year. An Equipment Capitalization Notice is available from the Research Section for the reporting of software or equipment purchased during the project. All software developed on the project will be completed in an open-source format, and ARDOT must be provided a copy of the source code. If non-expendable or special equipment is purchased with project funds, the equipment is owned by ARDOT and disposition of the equipment will be determined by ARDOT at the project's closeout.

All rental rates must be approved by ARDOT before the approval of the proposals. Should a subcontract be part of the Proposal, ARDOT will not approve the purchase of any equipment in the subcontract. Any equipment purchased through ARDOT's Transportation-Related Research & Workforce Development Grant Program or previous TRC projects is not eligible for rental rate charges.

All equipment must be purchased in accordance with the State of Arkansas purchasing laws and Arkansas Department of Transportation purchasing policies.

PROPOSALS

Proposals must be submitted in a word document utilizing the provided template to research@ardot.gov no later than the end of business on May 3, 2024. No proposals will be accepted after this date. All procedures must be in accordance with the most current Research Manual and Federal-Aid Policy Guide (FAPG). In the event of policy contradiction, the FAPG shall govern.

Upon approval of the Proposal by the Project Subcommittee, the Project Manager will initiate the process within Doc Express to acquire the appropriate electronic signatures from all parties.