



# **COLORADO**

## **Department of Transportation**

### **Non-project Specific (NPS) Scope of Work (SOW) for Exploration, Evaluation, Oversight and Design Work as Applied to Geologic Hazards and Geotechnical Engineering February 2024**

#### **Introduction**

The Colorado Department of Transportation (CDOT) recognizes the effect geologic hazards have on the transportation system. These hazards include rockfall, debris flow, landslides, sinkholes, embankment distress and other geotechnical related highway deterioration. The task of managing these hazards is the goal of the Geohazards and Geotechnical Services Programs. These programs are responsible for:

- Responding to emergency incidents involving geologic hazards and providing recommendations regarding highway safety and mitigation
- Responding to inquiries regarding potential geologic hazards from CDOT Maintenance, CDOT Engineering, and the public
- Managing Geohazards Program funding allocated through CDOT's Asset Management Program and Transportation Commission
- Maintaining the Geohazards Management Plan and the Transportation Asset Management Geohazards Project List
- Providing site characterization, analyses, and mitigation design for geohazard corridors and sites in accordance with the Geohazards Management Plan, and for Region Engineering and Maintenance as required
- Providing geotechnical investigation and designs for Region Engineering and Maintenance projects as requested
- Maintaining and updating the Geotechnical Design Manual, Geohazards Management Plan and performance metrics
- Inspecting and maintaining geohazard mitigation devices statewide including instrumentation
- Collecting, processing and managing data from instrumentation and remote sensing activities
- Ensuring state of the art geohazard and geotechnical investigation, evaluation and mitigation practices are implemented

The work for this contract is to assist the CDOT Geohazards and Geotechnical Services Programs with their responsible tasks and the refinement and implementation of statewide geohazard management practices.

#### **General Scope of Work**

The consultant will provide as needed assistance to investigate, evaluate, provide treatment recommendations, and design mitigation for management of geologic hazards. All applicable work is to be performed in accordance with applicable licensure as outlined in Section 3- Special Requirements- Licensure in the Solicitation for Professional Consultant Services. The consultant will also provide as needed assistance associated with data management in accordance with CDOT's Geohazard Management Plan including mitigation inventory and inspection, statewide monitoring and evaluation of geologic hazard sites, and geologic hazard mitigation construction oversight.

During critical emergencies involving geologic hazards and/or when qualified staff from CDOT is unavailable to respond, the consultant shall respond to the emergency as a representative of the Geohazard Services team. The response shall include an evaluation of the hazard and identification of mitigation options. The consultant shall apply industry accepted safety practices when accessing slopes and, where applicable, follow CDOT's Geohazard Emergency Response Guidelines during these incidents.

### **Qualifications and Availability**

The consultant performing this work shall demonstrate satisfactory performance of the type of work described in this SOW during the past three years by employees of the company.

Geologic hazard evaluations often require hands-on exploration of steep rock slopes and specific geologic features that require the use of rope access techniques. The consultant shall have knowledge of rope access techniques or the ability to train employees qualified under this SOW in use of rope access techniques.

The work involves responding to emergencies caused by geologic hazards and geotechnical asset deterioration. To provide this service, the consultant shall have at least one employee, who meets the qualification of this SOW, available at all times throughout the duration of this contract to respond to the emergency. The response shall be considered satisfactory if the consultant's employee is on site within 7 hours of being notified of the emergency unless otherwise directed by CDOT or the incident commander.

### **Authorization to Proceed and Work Limits**

Work for this contract shall be by Task Order for a specific task or combination of tasks. Unless authorized by emergency procedures, the work shall not commence until a written Notice-to-Proceed is received by the consultant and shall be completed in the time specified.

The work may be performed at locations throughout the state. Exact work locations cannot be predetermined for tasks associated with emergency response; responding to geologic hazard inquiries; monitoring; and data collection.

### **Status of Contract**

The Consultant shall monitor the fiscal status of the contract, and advise the CDOT Contract Manager of any potential for supplementing their contract or negotiating an additional task order. Failure to monitor contract status and provide timely notification may result in discontinuation of the Consultant's services until a supplemental agreement can be executed.

### **Full Scope of Services**

#### **A: Exploration and Design**

Provide geologic and geotechnical engineering exploration and designs that include plans and specifications using CDOT design standards for state of the art geologic hazard mitigation systems and geotechnical engineering applications. Consultants will be required to use current CDOT software packages as outlined in Section 3- Special Requirements: Software Requirements in the Solicitation For Professional Consultant Services. This work may include:

- Conducting site visits and field reconnaissance of slopes and geotechnical assets along highways as directed by CDOT.
- Providing recommendations for the most appropriate geologic hazard mitigation and geotechnical engineering measures based on safety, constructability, cost, performance and CDOT's asset management practices.
- Working with multidisciplinary teams to collaborate on viable design solutions for geologic hazards in a variety of contexts. This includes coordination with CDOT staff and outside agencies to present design options and offer collaborative solutions.

- Preparing draft and final design details and specifications for selected geologic hazard mitigation and geotechnical engineering solutions.
- Locating and staking locations for mitigation measures for design and construction.
- Coordinating collection of survey and subsurface information, including remote sensing data, and geophysical surveys for the purpose of enhancing geologic hazard and geotechnical investigation and design.

#### B: Oversight

Provide oversight, as requested, during construction of geohazard mitigation projects or projects with geotechnical components specifically when the plans call for constructed elements to be reviewed by a qualified geotechnical engineer or geologist. This task may involve the use of rope access techniques to reach construction locations on a slope. Oversight work may be necessary for planned STIP projects, as well as urgent-need construction services executed by on-call contractors. In some instances this work is time dependent and requires a subject matter expert to give recommendations with CDOT stakeholders in mind. This work may include:

- Providing urgent need treatment recommendations
- Directing construction activities
- Adherence to plans and specifications

#### C: Emergency Response

Respond to emergency rockfall and geologic hazard incidents. This task requires the consultant to respond to emergency incidents with a qualified employee as described in the Qualifications and Availability section of this SOW. The work includes:

- Evaluating the hazard that caused the emergency situation. This includes accessing the source area of the hazard, which may involve the use of rope access techniques, to evaluate the stability of slopes or geologic features.
- Providing recommendations regarding the urgency of the emergency and necessity of mitigation.
- Providing mitigation recommendations and designs.
- Communicating with Geohazards staff, CDOT maintenance crews, CDOT engineering teams, and involved contractors while guiding mitigation construction activities.
- Providing monitoring recommendations and installing monitoring systems such as instruments to measure displacement, loads, strain, or other relevant geotechnical criteria.

#### D: Monitoring

This task includes assistance with prioritizing locations for monitoring and instrumentation systems. These efforts shall be conducted with a focus on the overall performance of the transportation corridor the work is located in. Rope access techniques may be required to complete the work for this task. Equipment purchased through this contract for the purpose of monitoring shall become the property of CDOT. The work will involve:

- Providing monitoring recommendations and designing monitoring systems
- Providing and installing monitoring systems

#### E: Data Collection and Management

This task includes collecting and presenting data used to manage geologic hazards statewide. Data collection shall be in a format compatible with existing CDOT data management systems. Knowledge of GIS applications may be

required for this work. Rope access techniques and familiarity with CDOT traffic control standards may be required as well. The work will involve:

- Collecting geohazard site evaluation data
- Collecting geotechnical site evaluation data
- Maintaining in-place and remote monitoring equipment
- Inventorying and inspecting geologic hazard mitigation devices
- Providing recommendations and assistance to maintain and improve the Geohazard Management System

#### F: Other Services

As requested by CDOT and as specified in the Task Orders, other services such as bore hole drilling and geotechnical explorations otherwise not specified above may be requested on an as needed basis. The scope of work for these services will include details of the need.