



Non-project Specific Scope of Work (SOW) for Rockfall Hazards and Geological Investigations September 17, 2011

Introduction

The Colorado Department of Transportation (CDOT) recognizes the affect rockfall hazards have on the transportation system. The task of reducing these hazards and managing slopes recognized as having rockfall hazards falls to the CDOT Rockfall Program. The program is responsible for:

- Responding to emergency rockfall incidents and providing recommendations regarding highway safety and mitigation,
- Responding to inquiries regarding potential rockfall from CDOT Maintenance, CDOT Engineering, and the public,
- Allocating funds from the statewide rockfall pool,
- Providing rockfall design for projects funded from the statewide rockfall pool and by Engineering Regions when requested,
- Updating the Colorado Rockfall Hazard Rating System and prioritizing rockfall sites for funding,
- Maintaining rockfall mitigation devices statewide,
- Ensuring that state of the art mitigation practices are implemented.

As awareness of rockfall hazards have increased, so have the resources necessary to meet those needs. The CDOT Rockfall Program funding has been increased in an attempt to strengthen CDOT's rockfall management practices. The work for this contract is to assist the CDOT Rockfall Program with their responsible tasks.

General Scope of Work

The consultant will provide as needed assistance to the CDOT Rockfall Program by investigating and evaluating geological hazards, especially those associated with rock slopes and rockfall; designing rockfall mitigation; and designing debris flow mitigation. This work includes services as needed per PE stamp requirement of designs. The consultant will also provide as needed assistance associated with data management of the Colorado Rockfall Hazard Rating System; rockfall mitigation device inventory and inspection; and assist with statewide rockfall monitoring, rock scaling and mitigation oversight.

During critical rockfall emergencies and/or when qualified staff from CDOT is unavailable to respond, the consultant shall respond to the emergency. The response shall include an evaluation of the hazard that caused the emergency and providing mitigation options to the CDOT Rockfall

Program or incident commander if Rockfall Program personnel are unavailable. The consultant shall follow CDOT's Rockfall Emergency Response Procedures 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. Demonstration of this work shall be by employee resume/vitae and at least three recommendations from clients for whom the task listed in the SOW have been performed.

Rockfall and geological evaluations often require hands on investigation of steep rock slopes and specific geologic features that require the use of rope access techniques to reach. The consultant shall have knowledge of rope access techniques and the ability to train employees qualified under this SOW in use of rope access techniques.

The work involves responding to emergency rockfall and other geological hazards. 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 8 hours of being notified of the emergency unless otherwise directed by the CDOT Rockfall Program or incident commander.

To ensure emergency geologic services are maintained, the consultant shall notify the CDOT Rockfall Program at least one week in advance of being unable to fulfill the response requirement for rockfall and geological hazard emergencies in order for the CDOT Rockfall Program to arrange for other responders during the time when the consultant is unavailable.

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. Tasks associate with emergency response; responding to geologic hazard inquiries; monitoring; and data collection, exact work locations cannot be predetermined.

Status of Contract

The Consultant shall monitor the fiscal status of the contract, and advise the CDOT Rockfall Program 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 effected.

Full Scope of Services

A: Design

Provide geologic investigations and designs that include plans and specifications using CDOT design standards for state of the art rockfall and geological hazard mitigation systems. CADD work will be conducted using Microstation and Inroads Software, latest versions used by CDOT. The CDOT Rockfall Program and CDOT Engineering or Maintenance will oversee this work which will include:

- Conducting site visits and field reconnaissance of slopes along highways as directed by the CDOT Rockfall Program;
- Providing recommendations for the most the most appropriate mitigation measures for these locations based on safety, constructability and cost;
- Preparing draft and final design details and specifications for selected rockfall mitigation measures;
- Locating and staking locations for mitigation measures for design and construction;
- Providing construction oversight, as requested by the CDOT Rockfall Program, during construction of mitigation devices;
- Providing survey information, including data from laser scans, for the purpose of enhancing rockfall investigation and design and cross section of the slope, roadway and embankment.

B: Oversight

Provide construction oversight, as requested by the CDOT Rockfall Program, during construction of the mitigation devices. This task may involve use of rope access techniques to reach construction locations on the slope.

C: Emergency Response

Respond to emergency rockfall and geological 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 and in accordance with the CDOT Rockfall Emergency Response Procedures. 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 the slope or geologic feature;
- Providing mitigation recommendations to the CDOT Rockfall Program or CDOT Incident Commander;

- Providing recommendations to the CDOT Rockfall Program or CDOT Incident Commander if Rockfall Program personnel are not available regarding the urgency and need for mitigation;
- Guiding mitigation construction activities;
- Providing monitoring recommendations and installing monitoring systems.

D: Monitoring and Rock Scaling

This task includes assisting the Rockfall Program in prioritizing locations for installing rockfall monitoring systems and conducting rock scaling. 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;
- Providing rock scaling recommendations;
- Guiding on-site rock scaling activities.

E: Data Management and Collection

This task includes assisting the Rockfall Program in managing, collecting and presenting data used to manage rock slopes statewide. This data is used to allocate resources for the Rockfall Program. Knowledge of GIS applications may be required to complete this work. Rope access techniques and CDOT traffic control standards may be required to complete the work for this task. The work will involve:

- Collecting rock slope rating data,
- Inventorying and inspecting rockfall mitigation devices;
- Providing recommendations and assisting in developing a “Geotechnical Asset Management” system for rock slopes;

F: Other Services

As requested by the CDOT Rockfall Program and as specified in the Task Orders, other services not specified above may be requested on an as needed basis. The scope of work for these services will include details of the needs.