



Landslide Investigations, Designs and Repairs

CEC provides turnkey services to the midstream sector and facility owners to address landslide-related issues. CEC geotechnical engineers provide initial assessment services, perform subsurface investigations, and develop remedial designs for landslides. In addition, CEC construction services



LANDSLIDE ASSESSMENTS

CEC geotechnical engineers perform assessments of landslides at facilities or along rights-of-ways to assess the severity of the landslide and provide recommendations to address the ground movement.

GEOTECHNICAL INVESTIGATIONS

Significant landslides require a subsurface investigation to assess the severity of the landslide and rate of movement, and to design a repair. Depending on the conditions, CEC's geotechnical investigations can include:

- Test drilling with split-spoon, Shelby tube, or rock sampling
- Excavating test pits with bulk soil sampling
- Hand sampling of soils using bucket augers or other methods
- Installing of slope inclinometers
- Laboratory testing

REMEDIAL DESIGNS

CEC's geotechnical engineers analyze the data gathered and develop cost-effective remedial designs using current software and analytical methods for slope stability analyses, retaining wall designs, and stabilization techniques such as the Tecco® system, soil nailing, and plate piles.

CONSTRUCTION PHASE SERVICES

CEC construction services professionals can manage the remedial construction, manage subcontractors, or provide support during bidding and construction as needed. Additionally, construction inspectors are experienced in performing field testing and monitoring for compliance with the design plans and specifications.

ADDITIONAL SERVICES

CEC performs other services often needed to complete the remedial design of a landslide or to facilitate the repair. Surveying the limits of the landslide, access, and surrounding property/topography is typically needed to complete the design and to prepare the construction documents for remediation. CEC utilizes a number of different survey technologies including total station, 3D LiDAR scanning, and unmanned aerial vehicles (UAVs or drones) and selects the appropriate technology depending on the site conditions. In addition, CEC performs wetland and stream delineations and completes erosion and sediment control permitting, which are often necessary to remediate landslides. CEC has also designed and completed stream restoration to address impacts associated with landslides.

EMERGENCY/HIGH-HAZARD INSPECTIONS

CEC has an in-house pilot and is permitted by the FAA to operate its own UAVs. The quad-copter or fixed-winged UAVs can be rapidly deployed to obtain video footage, photography and/or topographic information in emergency situations, high-hazard areas or where there is unsafe terrain.