Engineering Analytics, Inc.

PROJECT EXAMPLES

CONSTRUCTION & DESIGN DEFECT INVESTIGATION

DISTRESS DUE TO EXPANSIVE SOILS

FAA TRACON Building, Denver, Colorado

Engineering Analytics, Inc. (EA) staff was contracted by the Federal Aviation Administration (FAA) to perform a geotechnical engineering investigation of the TRACON building at Denver International Airport, Denver, Colorado. The building was built with a slab-on-grade concrete floor and supported on a pier and grade beam foundation, and it has been undergoing distress for more than 15 years. The site is located in an area with highly expansive soils/bedrock. The investigation and analyses, including foundation movement monitoring, measurements and modeling of water migration in the vadose zone, and calculations of free-field heave and pier heave, were performed to identify the design and construction deficiencies. Additionally, conceptual repair options and associated costs were presented.

PAVEMENT AND ETTRINGITE INVESTIGATION

78th Avenue Parking Facilities, Denver, Colorado

Engineering Analytics staff performed a geotechnical investigation evaluating pavement and structure distress at 78th Avenue Parking Facilities, Denver International Airport, Denver, Colorado. The soils at the site consisted of highly-expansive native clay underlain by claystone bedrock. The subgrade soils were lime-treated prior to construction, however, the parking lot has experienced distress from heaving expansive soils/bedrock and ettringite development. EA staff evaluated causes of ettringite development and proposed a remediation plan reducing the potential heave.

Highlighted Services

- Expansive Soils, Pavement, and Ettringite Investigations
- Settlement and Compaction Investigations
- Landslide Investigations
- Hydroconsolidation Investigations
- Retaining Wall Investigations
- Surface Grading and Drainage Investigations
- Tailings Dam Failure Investigations
- Water Retention Dam Failure Investigations

ROADWAYS FILLS AND LANDSLIDE STABILIZATION

Cedar Height Subdivision, Colorado Springs, Colorado

Engineering Analytics staff performed an investigation of approximately seven miles of distressed roadways for a large private housing development in Colorado Springs, Colorado. A majority of the distress was caused by settlement of poorly compacted structural fill. Twenty-three active landslides were identified within the development. EA staff performed geological, geotechnical, and hydrogeological investigations analyzing the roadway settlement and landslides. EA staff prepared plans and specifications for repair of the distress areas. The estimated repair cost was $9.4 million.

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DISTRESS DUE TO COLLAPSIBLE SOILS

Pine Ridge Townhomes, Basalt, Colorado

Engineering Analytics, Inc. (EA) staff completed a geotechnical investigation and remediation plan for a distressed, multi-family, residential building in Basalt, Colorado. Collapsible soils were identified at the site by geohazard evaluations and pre-construction investigations during the 1990's. Within 10 years of the construction, buildings experienced a 1.9- to 5.1-inch differential settlement. Our investigation included identifying collapsible soil locations and determining future potential settlement.

RETAINING WALL FAILURE

Port Moody, British Columbia

Engineering Analytics staff performed a forensic investigation of the collapse of a 35-foot-high Stresswall retaining system in Port Moody, British Columbia. The retaining wall system was not constructed in accordance with the design plans. The Stresswall failed after intense rainfall events. Seepage and slope stability analyses were performed to evaluate the effect of rainfall events on the stability of the as-built and as-designed retaining walls. We determined that the wall failed due to large rainfall developing excess pore water pressures in the wall backfill. The resulting analyses also indicated that if the original design had been followed, the wall system would have been able to meet the required global stability.

GRADING AND DRAINAGE INVESTIGATIONS

Sonnet Springs Subdivision, Colorado Springs, Colorado

Engineering Analytics performed a surface grading and drainage survey for 47 town homes located in Colorado Springs, Colorado. The results of the grading survey indicated that the grading at 181 out of 217 locations did not meet the minimum 10% grading specified by the soils report. EA recommended the site slopes be re-graded to 10% for the first 10 feet around the structures. We provided cut and fill volume estimates for remediation of the drainage conditions. We also provided a third party review of proposed drainage improvement at the site.

PINAL CREEK CONTAMINANT ASSESSMENT

Gila County, Arizona

Engineering Analytics staff performed a geotechnical investigation to evaluate contamination of groundwater by seepage from a copper mine tailings impoundment in Gila County, Arizona. The geotechnical investigation included seepage analyses to identify seepage source, calculations of water balance, and allocation for groundwater remediation.