



## PROJECT PROFILE

# Shadow Mountain

Geotechnical Instrumentation and Monitoring | Aspen, CO



### CLIENT

Shadow Mountain Condominium Homeowners Association

### BACKGROUND

The condominiums are located at the west end of South Aspen Street, across the street from the bottom of the Shadow Mountain Chair at Aspen Mountain.

Initial plans for development of the adjacent property included a deep excavation to provide four levels of below-grade parking. Inclinometers were installed in 2008 and were monitored and evaluated for eight years prior to construction.

WJE engineers were retained to assist the Shadow Mountain Condominium Homeowners Association by addressing concerns that the condominiums would be damaged as a result of slope movement associated with development of an adjacent downhill property. Development of the adjacent property included construction of a thirty-two foot vertical excavation adjacent to the downhill property line. The excavation was supported by an earth retention system with two levels of grouted tie-back anchors extending beneath the HOA property.



### SOLUTION

Geotechnical engineering and monitoring services included investigation of subsurface conditions, evaluation of historic foundation movement, installation and monitoring of inclinometers and evaluation of survey data, and consultation. Engineering consultation included evaluation of mitigation measures that could be implemented to address previous settlement that had occurred at several of the condominium buildings. Inclinometers were installed and read for several years to establish a baseline record of slope movement prior to development of the adjacent property. Additional monitoring during construction included surveying movement monuments installed on the condominium buildings and on the excavation support system. The inclinometer and survey data, and conditions on site were reviewed to evaluate the performance of the excavation support system.

Additional services provided included documentation of pre-construction conditions inside and outside the condominiums, and review of the excavation support design documents. Concerns with the original excavation support system resulted in significant modification of the design.

