

PROJECT DESCRIPTION

PROJECT: Casey Family Program Seattle Headquarters
LOCATION: Seattle, Washington
CONTRACTOR: Turner Construction Company, Special Projects Division



DESCRIPTION:

The project is affiliated with United Parcel Service (UPS) and is a headquarters facility for a charitable organization, which trains foster parents and places foster children in homes.

The building site is underlain by about a 7 to 10 foot thickness of loose existing fills above dense glacial till soils. Near-surface groundwater levels were present. Augercast piles were initially planned to provide foundation support and to provide resistance of uplift loads due to seismic loading.

The Geopier® System was proposed and selected as a Value Engineering option to replace the augercast piles. The very stiff Rammed Aggregate Pier® (RAP) provided sound foundation support with small magnitudes of foundation settlement. Under seismic loading conditions, the RAP provide increased bearing support, increased friction for resistance of lateral loads and resistance of uplift loading. The RAP elements are ductile, which allows the Geopier elements to deform with the soil mass and thus provides for greater post-earthquake integrity. Piers designed to resist uplift loads were placed beneath the stair towers where a high magnitude of uplift resulted from seismic loading.

The Geopier RAP elements will significantly reduce the potential for soil liquefaction in the upper Geopier-reinforced soil layer (loose silty sands). This reduced liquefaction potential results in a significant decrease in the potential for bearing capacity failure and excessive settlement during and following major seismic events. The Geopier approach addressed the technical requirements of the project by minimizing foundation settlements to small magnitudes, mitigating site liquefaction concerns, and providing resistance to high seismic uplift loads.

An uplift load test was conducted on a test pier to verify the uplift resistance and to be used as a basis for final design. The test pier had a height of about 12' and extended about 5' into the underlying dense glacial soils. The test load was applied in increments to a maximum load of 115 kips. About 1" of total deflection was noted in the steel bars at this maximum load. At the design working load of 55 kips only about 1/3" of total movement was noted. The majority of this deflection was elastic.