

**RIDGECREST EARTHQUAKE SEQUENCE: STRONG MOTION DATA AND  
GEOTECHNICAL ENGINEERING IMPACTS**

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**Abstract**

The Ridgecrest Earthquake sequence included a foreshock event on July 4 2019 (M6.4) and a M7.1 mainshock event on July 5 2019. These events occurred in the Eastern California Shear Zone, near Indian Wells Valley, south of China Lake and west of Searles Valley. GEER partnered with several organizations to collect perishable data and document the important impacts of these events, including the US Geological Survey, the California Geological Survey, the US Navy, the Southern California Earthquake Center, and local utilities. Critical geotechnical features of this event are extensive left-lateral (M6.4 event) and right-lateral (M7.1 event) surface ruptures over fault segments of variable complexity and width as well as across extensional and compressive step-over zones. We also document lifeline performance at fault crossings (gas, water, electrical), mainshock slip and afterslip, liquefaction and lateral spreading features, and liquefaction effects on structures. These effects are documented using field (ground) mapping and aerial imagery that will support subsequent development of high-resolution digital elevation models. Over 1200 ground motions were recorded from the foreshock and mainshock alone, with many additional aftershock records. The data demonstrate significant impacts of site response and rupture directivity on ground motion attributes.

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