

EARTHQUAKE SURFACE FAULT RUPTURE DESIGN CONSIDERATIONS

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Abstract: Buildings, facilities, and lifelines that will be sited across or adjacent to active faults should be designed considering the hazards associated with earthquake surface fault rupture. Observations of surface faulting during earthquakes show how the resulting ground movements affect engineered systems. Lessons learned from these case histories can be extended to provide insight on a particular project through the use of numerical analyses that have been calibrated by field observations and experimental data. Similar to other forms of ground failure, such as mining subsidence, landslides, and lateral spreading, effective design strategies can be employed to address the hazards associated with surface faulting. These design measures include establishing non-arbitrary setbacks based on fault geometry, fault displacement, and site conditions; constructing reinforced earth fills to partially absorb underlying ground movements; using slip layers to decouple ground movements from foundation elements; and designing strong, ductile foundation elements that can resist the resulting earth pressures.