



Fig. R12.1.1—Typical diaphragm actions.

12.1.2 Diaphragms in structures assigned to Seismic Design Category D, E, or F shall also satisfy requirements of 18.12.

12.2—General

12.2.1 Design shall consider forces (a) through (e):

- (a) Diaphragm in-plane forces due to lateral loads acting on the building
- (b) Diaphragm transfer forces
- (c) Connection forces between the diaphragm and vertical framing or nonstructural elements
- (d) Forces resulting from bracing vertical or sloped building elements
- (e) Diaphragm out-of-plane forces due to gravity and other loads applied to the diaphragm surface

R12.2—General

R12.2.1 As partially illustrated in Fig. R12.1.1, diaphragms resist forces from several types of actions (Moehle et al. 2010):

(a) **Diaphragm in-plane forces**—Lateral forces from load combinations including wind, earthquake, and horizontal fluid or soil pressure generate in-plane shear, axial, and bending actions in diaphragms as they span between, and transfer forces to, vertical elements of the lateral-force-resisting system. For wind loading, lateral force is generated by wind pressure acting on building cladding that is transferred by diaphragms to the vertical elements. For earthquake loading, inertial forces are generated within the diaphragm and tributary portions of walls, columns, and other elements, and then transferred by diaphragms to the vertical elements. For buildings with subterranean levels, lateral forces are generated by soil pressure bearing against the basement walls; in a typical system, the basement walls span vertically between floors also serving as diaphragms,