

*12.2.5.7.2 Seismic Design Category E.*

- a. Single-story steel intermediate moment frames in structures assigned to Seismic Design Category E are permitted up to a structural height,  $h_n$ , of 65 ft (20 m) where the dead load supported by and tributary to the roof does not exceed 20 psf (0.96 kN/m<sup>2</sup>). In addition, the dead load of the exterior walls more than 35 ft (10.6 m) above the base tributary to the moment frames shall not exceed 20 psf (0.96 kN/m<sup>2</sup>).

**EXCEPTION:** Single-story structures with steel intermediate moment frames whose purpose is to enclose equipment or machinery and whose occupants are engaged in maintenance or monitoring of that equipment, machinery, or their associated processes shall be permitted to be of unlimited height where the sum of the dead and equipment loads supported by and tributary to the roof does not exceed 20 psf (0.96 kN/m<sup>2</sup>). In addition, the dead load of the exterior wall system including exterior columns more than 35 ft (10.6 m) above the base shall not exceed 20 psf (0.96 kN/m<sup>2</sup>). For determining compliance with the exterior wall or roof load limits, the weight of equipment or machinery, including cranes, not self-supporting for all loads shall be assumed fully tributary to the area of the adjacent exterior wall or roof not to exceed 600 ft<sup>2</sup> (55.8 m<sup>2</sup>) regardless of their height above the base of the structure.

- b. Steel intermediate moment frames in structures assigned to Seismic Design Category E not meeting the limitations set forth in Section 12.2.5.7.2.a are permitted up to a structural height,  $h_n$ , of 35 ft (10.6 m) where neither the roof dead load nor the dead load of any floor above the base supported by and tributary to the moment frames exceeds 35 psf (1.68 kN/m<sup>2</sup>). In addition, the dead load of the exterior walls tributary to the moment frames shall not exceed 20 psf (0.96 kN/m<sup>2</sup>).

*12.2.5.7.3 Seismic Design Category F.*

- a. Single-story steel intermediate moment frames in structures assigned to Seismic Design Category F are permitted up to a structural height,  $h_n$ , of 65 ft (20 m) where the dead load supported by and tributary to the roof does not exceed 20 psf (0.96 kN/m<sup>2</sup>). In addition, the dead load of the exterior walls tributary to the moment frames shall not exceed 20 psf (0.96 kN/m<sup>2</sup>).
- b. Steel intermediate moment frames in structures assigned to Seismic Design Category F not

meeting the limitations set forth in Section 12.2.5.7.3.a are permitted within light-frame construction up to a structural height,  $h_n$ , of 35 ft (10.6 m) where neither the roof dead load nor the dead load of any floor above the base supported by and tributary to the moment frames exceeds 35 psf (1.68 kN/m<sup>2</sup>). In addition, the dead load of the exterior walls tributary to the moment frames shall not exceed 20 psf (0.96 kN/m<sup>2</sup>).

*12.2.5.8 Shear Wall-Frame Interactive Systems*

The shear strength of the shear walls of the shear wall-frame interactive system shall be at least 75 percent of the design story shear at each story. The frames of the shear wall-frame interactive system shall be capable of resisting at least 25 percent of the design story shear in every story.

## 12.3 DIAPHRAGM FLEXIBILITY, CONFIGURATION IRREGULARITIES, AND REDUNDANCY

*12.3.1 Diaphragm Flexibility*

The structural analysis shall consider the relative stiffnesses of diaphragms and the vertical elements of the seismic force-resisting system. Unless a diaphragm can be idealized as either flexible or rigid in accordance with Sections 12.3.1.1, 12.3.1.2, or 12.3.1.3, the structural analysis shall explicitly include consideration of the stiffness of the diaphragm (i.e., semirigid modeling assumption).

*12.3.1.1 Flexible Diaphragm Condition*

Diaphragms constructed of untopped steel decking or wood structural panels are permitted to be idealized as flexible if any of the following conditions exist:

- a. In structures where the vertical elements are steel braced frames, steel and concrete composite braced frames or concrete, masonry, steel, or steel and concrete composite shear walls.
- b. In one- and two-family dwellings.
- c. In structures of light-frame construction where all of the following conditions are met:
  1. Topping of concrete or similar materials is not placed over wood structural panel diaphragms except for nonstructural topping no greater than 1 1/2 in. (38 mm) thick.
  2. Each line of vertical elements of the seismic force-resisting system complies with the allowable story drift of Table 12.12-1.