with the manufacturer's instructions. For those cases where no certification exists or where instructions for such reinforcement are not provided, reinforcement methods shall be as specified by a registered design professional or as approved by the authority having jurisdiction.

3. Where weak-axis bending of cold-formed steel supports is relied on for the seismic load path, such supports shall be specifically evaluated.
4. Components mounted on vibration isolators shall have a bumper restraint or snubber in each horizontal direction, and vertical restraints shall be provided where required to resist overturning. Isolator housings and restraints shall be constructed of ductile materials. (See additional design force requirements in footnote *b* to Table 13.6-1.) A viscoelastic pad or similar material of appropriate thickness shall be used between the bumper and components to limit the impact load.
5. Where post-installed mechanical anchors are used for non-vibration isolated mechanical equipment rated over 10 hp (7.45 kW), they shall be qualified in accordance with ACI 355.2.
6. For piping, boilers, and pressure vessels, attachments to concrete shall be suitable for cyclic loads.
7. For mechanical equipment, drilled and grouted-in-place anchors for tensile load applications shall use either expansive cement or expansive epoxy grout.

13.6.5.6 Conduit, Cable Tray, and Other Electrical Distribution Systems (Raceways)

Raceways shall be designed for seismic forces and seismic relative displacements as required in Section 13.3. Conduit greater than 2.5 in. (64 mm) trade size and attached to panels, cabinets, or other equipment subject to seismic relative displacement, D_p, shall be provided with flexible connections or designed for seismic forces and seismic relative displacements as required in Section 13.3.

EXCEPTIONS:

1. Design for the seismic forces and relative displacements of Section 13.3 shall not be required for raceways where either:
   a. Trapeze assemblies are used to support raceways and the total weight of the raceway supported by trapeze assemblies is less than 10 lb/ft (146 N/m), or
   b. The raceway is supported by hangers and each hanger in the raceway run is 12 in. (305 mm) or less in length from the raceway support point to the supporting structure. Where rod hangers are used, they shall be equipped with swivels to prevent inelastic bending in the rod.
2. Design for the seismic forces and relative displacements of Section 13.3 shall not be required for conduit, regardless of the value of I_p, where the conduit is less than 2.5 in. (64 mm) trade size.

13.6.6 Utility and Service Lines

At the interface of adjacent structures or portions of the same structure that may move independently, utility lines shall be provided with adequate flexibility to accommodate the anticipated differential movement between the portions that move independently. Differential displacement calculations shall be determined in accordance with Section 13.3.2.

The possible interruption of utility service shall be considered in relation to designated seismic systems in Risk Category IV as defined in Table 1.5-1. Specific attention shall be given to the vulnerability of underground utilities and utility interfaces between the structure and the ground where Site Class E or F soil is present, and where the seismic coefficient S_{DS} at the underground utility or at the base of the structure is equal to or greater than 0.33.

13.6.7 Ductwork

HVAC and other ductwork shall be designed for seismic forces and seismic relative displacements as required in Section 13.3. Design for the displacements across seismic joints shall be required for ductwork with $I_p = 1.5$ without consideration of the exceptions below.

EXCEPTIONS: The following exceptions pertain to ductwork not designed to carry toxic, highly toxic, or flammable gases or used for smoke control:

1. Design for the seismic forces and relative displacements of Section 13.3 shall not be required for ductwork where either:
   a. Trapeze assemblies are used to support ductwork and the total weight of the ductwork supported by trapeze assemblies is less than 10 lb/ft (146 N/m); or
   b. The ductwork is supported by hangers and each hanger in the duct run is 12 in. (305 mm) or less in length from the duct support point to the supporting structure. Where rod hangers are used, they shall be equipped with swivels to prevent inelastic bending in the rod.
2. Design for the seismic forces and relative displacements of Section 13.3 shall not be required where provisions are made to avoid impact with larger