

**1613.9.5 Base shear resistance-primary anchors.**

**1613.9.5.1 General.** The base shear in the downhill direction shall be resisted through primary anchors from diaphragm struts provided in the base level diaphragm to the foundation.

**1613.9.5.2 Location of primary anchors.** A primary anchor and diaphragm strut shall be provided in line with each foundation extending in the downhill direction. Primary anchors and diaphragm struts shall also be provided where interior vertical lateral-force-resisting elements occur above and in contact with the base level diaphragm. The spacing of primary anchors and diaphragm struts or collectors shall in no case exceed 30 feet (9144 mm).

**1613.9.5.3 Design of primary anchors and diaphragm struts.** Primary anchors and diaphragm struts shall be designed in accordance with the requirements of Section 1613.9.8.

**1613.9.5.4 Limitations.** The following lateral-force-resisting elements shall not be designed to resist seismic forces below the base level diaphragm in the downhill direction:

1. Wood structural panel wall sheathing;
2. Cement plaster and lath;
3. Gypsum wallboard; and
4. Tension only braced frames.

Braced frames designed in accordance with the requirements of Section 2205.2.2 of this Code may be used to transfer forces from the primary anchors and diaphragm struts to the foundation, provided lateral forces do not induce flexural stresses in any member of the frame or in the diaphragm struts. Deflections of frames shall account for the variation in slope of diagonal members when the frame is not rectangular.

**1613.9.6 Base shear resistance-secondary anchors.**

**1613.9.6.1 General.** In addition to the primary anchors required by Section 1613.9.5, the base shear in the downhill direction shall be resisted through secondary anchors in the uphill foundation connected to diaphragm struts in the base level diaphragm.

**Exception:** Secondary anchors are not required where foundations extending in the downhill direction spaced at not more than 30 feet (9144 mm) on center extend up to and are directly connected to the base level diaphragm for at least 70 percent of the diaphragm depth.

**1613.9.6.2 Secondary anchor capacity and spacing.** Secondary anchors at the base level diaphragm shall be designed for a minimum force equal to the base shear, including forces tributary to the base level diaphragm, but not less than 600 pounds per lineal foot (8.76 kN/m). The secondary anchors shall be uniformly distributed along the uphill diaphragm edge and shall be spaced a maximum of 4 feet (1219 mm) on center.

**1613.9.6.3 Design.** Secondary anchors and diaphragm struts shall be designed in accordance with Section 1613.9.8.

**1613.9.7 Diaphragms below the base level—downhill direction.** The following provisions shall apply to the lateral analysis and design of the connections for all diaphragms below the base level diaphragm in the downhill direction.

**1613.9.7.1 Diaphragm defined.** Every floor level below the base level diaphragm shall be designed as a diaphragm.

**1613.9.7.2 Design force.** Each diaphragm below the base level diaphragm shall be designed for all tributary loads at that level using a minimum seismic force factor not less than the base shear coefficient.

**1613.9.7.3 Design force resistance-primary anchors.** The design force described in Section 1613.9.7.2 shall be resisted through primary anchors from diaphragm struts provided in each diaphragm to the foundation. Primary anchors shall be provided and designed in accordance with the requirements and limitations of Section 1613.9.5.

**1613.9.7.4 Design force resistance-secondary anchors.**

**1613.9.7.4.1 General.** In addition to the primary anchors required in Section 1613.9.7.3, the design force in the downhill direction shall be resisted through secondary anchors in the uphill foundation connected to diaphragm struts in each diaphragm below the base level.

**Exception:** Secondary anchors are not required where foundations extending in the downhill direction, spaced at not more than 30 feet (9144 mm) on center, extend up to and are directly connected to each diaphragm below the base level for at least 70 percent of the diaphragm depth.

**1613.9.7.4.2 Secondary anchor capacity.** Secondary anchors at each diaphragm below the base level diaphragm shall be designed for a minimum force equal to the design force but not less than 300 pounds per lineal foot (4.38 kN/m). The secondary anchors shall be uniformly distributed along the uphill diaphragm edge and shall be spaced a maximum of four feet (1219 mm) on center.

**1613.9.7.4.3 Design.** Secondary anchors and diaphragm struts shall be designed in accordance with Section 1613.9.8.

**1613.9.8 Primary and secondary anchorage and diaphragm strut design.** Primary and secondary anchors and diaphragm struts shall be designed in accordance with the following provisions:

1. **Fasteners.** All bolted fasteners used to develop connections to wood members shall be provided with square plate washers at all bolt heads and nuts. Washers shall be minimum  $3/16$ -inch (4.8 mm) thick