

**TABLE A1-E—STRENGTH VALUES OF NEW MATERIALS USED IN CONJUNCTION WITH EXISTING CONSTRUCTION**

NEW MATERIALS OR CONFIGURATION OF MATERIALS		STRENGTH VALUES
Horizontal diaphragms	Plywood sheathing applied directly over existing straight sheathing with ends of plywood sheets bearing on joists or rafters and edges of plywood located on center of individual sheathing boards.	675 lbs. per ft.
Crosswalls	Plywood sheathing applied directly over wood studs; no value should be given to plywood applied over existing plaster or wood sheathing.	1.2 times the value specified in the current building code.
	Drywall or plaster applied directly over wood studs.	The value specified in the current building code.
	Drywall or plaster applied to sheathing over existing wood studs.	50 percent of the value specified in the current building code.
Tension bolts <sup>e</sup>	Bolts extending entirely through unreinforced masonry wall secured with bearing plates on far side of a three-wythe- minimum wall with at least 30 square inches of area. <sup>b,c</sup>	5,400 lbs. per bolt 2,700 lbs. for two-wythe walls
Shear bolts <sup>e</sup>	Bolts embedded a minimum of 8 inches into unreinforced masonry walls; bolts should be centered in 2 1/2-inch-diameter holes with dry-pack or nonshrink grout around the circumference of the bolt.	The value for plain masonry specified for solid masonry in the current building code; no value larger than those given for 3/4-inch bolts should be used.
Combined tension and shear bolts	Through-bolts—bolts meeting the requirements for shear and for tension bolts. <sup>b,c</sup>	Tension—same as for tension bolts Shear—same as for shear bolts
	Embedded bolts—bolts extending to the exterior face of the wall with a 2 1/2-inch round plate under the head and drilled at an angle of 22 1/2 degrees to the horizontal; installed as specified for shear bolts. <sup>a,b,c</sup>	Tension—3,600 lbs. per bolt Shear—same as for shear bolts
Infilled walls	Reinforced masonry infilled openings in existing unreinforced masonry walls; provide keys or dowels to match reinforcing.	Same as values specified for unreinforced masonry walls
Reinforced masonry <sup>d</sup>	Masonry piers and walls reinforced per the current building code.	The value specified in the current building code for strength design.
Reinforced concrete <sup>d</sup>	Concrete footings, walls and piers reinforced as specified in the current building code.	The value specified in the current building code for strength design.

For SI: 1 inch = 25.4 mm, 1 square inch = 645.16 mm<sup>2</sup>, 1 pound = 4.4 N.

- a. Embedded bolts to be tested as specified in Section A107.4.
- b. Bolts to be 1/2 inch (12.7 mm) minimum in diameter.
- c. Drilling for bolts and dowels shall be done with an electric rotary drill; impact tools should not be used for drilling holes or tightening anchors and shear bolt nuts.
- d. No load factors or capacity reduction factor shall be used.
- e. Other bolt sizes, values and installation methods may be used, provided a testing program is conducted in accordance with UBC Standard 21-7. The useable value shall be determined by multiplying the calculated allowable value, as determined by UBC Standard 21-7, by 3.0, and the useable value shall be limited to a maximum of 1.5 times the value given in the table. Bolt spacing shall not exceed 6 feet (1829 mm) on center and shall not be less than 12 inches (305 mm) on center.

**TABLE A1-F—MAXIMUM ALLOWABLE HEIGHT-TO-THICKNESS RATIOS FOR PARAPETS**

	S <sub>D1</sub>		
	0.13 <sub>g</sub> ≤ S <sub>D1</sub> < 0.25 <sub>g</sub>	0.25 <sub>g</sub> ≤ S <sub>D1</sub> < 0.4 <sub>g</sub>	S <sub>D1</sub> ≥ 0.4 <sub>g</sub>
Maximum allowable height-to-thickness ratios	2.5	2.5	1.5

**TABLE A1-G—MAXIMUM HEIGHT-TO-THICKNESS RATIOS FOR ADOBE OR STONE WALLS**

	S <sub>D1</sub>		
	0.13 <sub>g</sub> ≤ S <sub>D1</sub> < 0.25 <sub>g</sub>	0.25 <sub>g</sub> ≤ S <sub>D1</sub> < 0.4 <sub>g</sub>	S <sub>D1</sub> ≥ 0.4 <sub>g</sub>
One-story buildings	12	10	8
Two-story buildings			
First story	14	11	9
Second story	12	10	8