Wall configuration	2-Wire ladder	2-Wire truss	3-Wire ladder	3-Wire truss	2-Wire ladder or truss with adjustable ties	2-Wire ladder or truss with fixed tabs	2-Wire ladder or truss with seismic ties
Single-wythe							
• With vertical reinforcing steel	•						
Single-wythe							
• Without vertical reinforcing steel		•					
Multi-wythe							
• Insulated cavity							
• Both wythes laid at same time			•				
• Backing and facing wythes both CMU							
Multi-Wythe							
• Uninsulated cavity							
• Both wythes laid at same time			•	•			
• Backing and facing wythes both CMU							
Multi-wythe							
• Wythes laid at different times							
• Backing wythe CMU, facing wythe clay masonry or stone					•		
Multi-wythe							
• Uninsulated cavity							
• Both wythes laid at same time						•	
• Backing wythe CMU, facing wythe clay masonry or stone							
Multi-wythe							
• Both wythes laid at same time							
• Backing and facing wythes CMU			•	•			
• Seismic Performance Category C							
Multi-wythe							
• Wythes laid at different times							
• Backing wythe CMU, facing wythe clay masonry or stone							•
• Seismic Performance Category C							

Figure 7-9 Joint reinforcement selection guide. (*Adapted from Mario Catani, "Selecting the Right Joint Reinforcement for the Job,"* The Magazine of Masonry Construction*, January 1995.*)

highest corrosion protection in severe exposures, and should conform to ASTM A167, Type 304.

Joint reinforcement is available in several wire diameters, and in standard lengths of 10 to 12 ft. Longitudinal wires are available in standard 9 gauge (W1.7) and extra-heavy $\frac{3}{16}$ in. (W2.8). Standard 9-gauge wire provides better fit and more practical constructability in $\frac{3}{8}$-in. mortar joints. With extra-heavy $\frac{3}{16}$-in. wire, there is little room for construction tolerances, and a Type M or Type S mortar is required to develop full bond strength with the steel. Heavy-gauge joint reinforcement should be used only when there is compelling engineering rationale. Cross wires are typically either 9 or 12 gauge. Fabricated joint reinforcement widths are approximately $1\frac{5}{8}$ in. less than the actual wall thickness, to assure adequate mortar coverage. The

mortar cover at the exterior wall face should be at least ⅝ in. Prefabricated "L" and "T" sections are used at corners and intersecting walls to prevent cracking and separation (*see Fig. 7-10*).

7.3 CONNECTORS

There are three different types of masonry connectors. *Anchors* attach masonry to a structural support such as an intersecting wall, a floor, a beam, or a column. This type of connector includes anchor bolts and veneer anchors used to attach masonry veneers to backing walls of non-masonry construction. *Ties* connect multiple wythes of masonry together in cavity wall or composite wall construction. *Fasteners* attach other building elements or accessories to masonry.

7.3.1 Ties

While joint reinforcement can provide longitudinal strength in addition to lateral connection between wythes, individual *corrugated* or *wire ties* function only in the lateral direction, providing intermittent rather than continuous connection. There are several shapes and configurations, different wire gauges, and various sizes to suit the wall thickness. *Woven wire mesh* is sometimes used to connect intersecting masonry walls when no load transfer is desired. This is a soft connection and requires the installation of control joints at the wall intersection (*see Fig. 7-11*). Wire ties should be used in open-cavity walls and grouted multi-wythe walls. Wire ties may be rigid for laying in bed joints at the same height, or adjustable for laying in bed joints at different levels (*see Figs. 7-12 and 7-13*). Adjustable ties also permit differential expansion and contraction between backing and facing wythes of cavity walls. This is particularly important when connecting between clay and concrete masonry because the thermal and moisture movement characteristics of the materials are so different. Crimped ties which form a water drip in the cavity are not recommended because the

Figure 7-10 Prefabricated "L" and "T" sections of joint reinforcement are used at corners and intersecting walls to prevent this type of cracking.