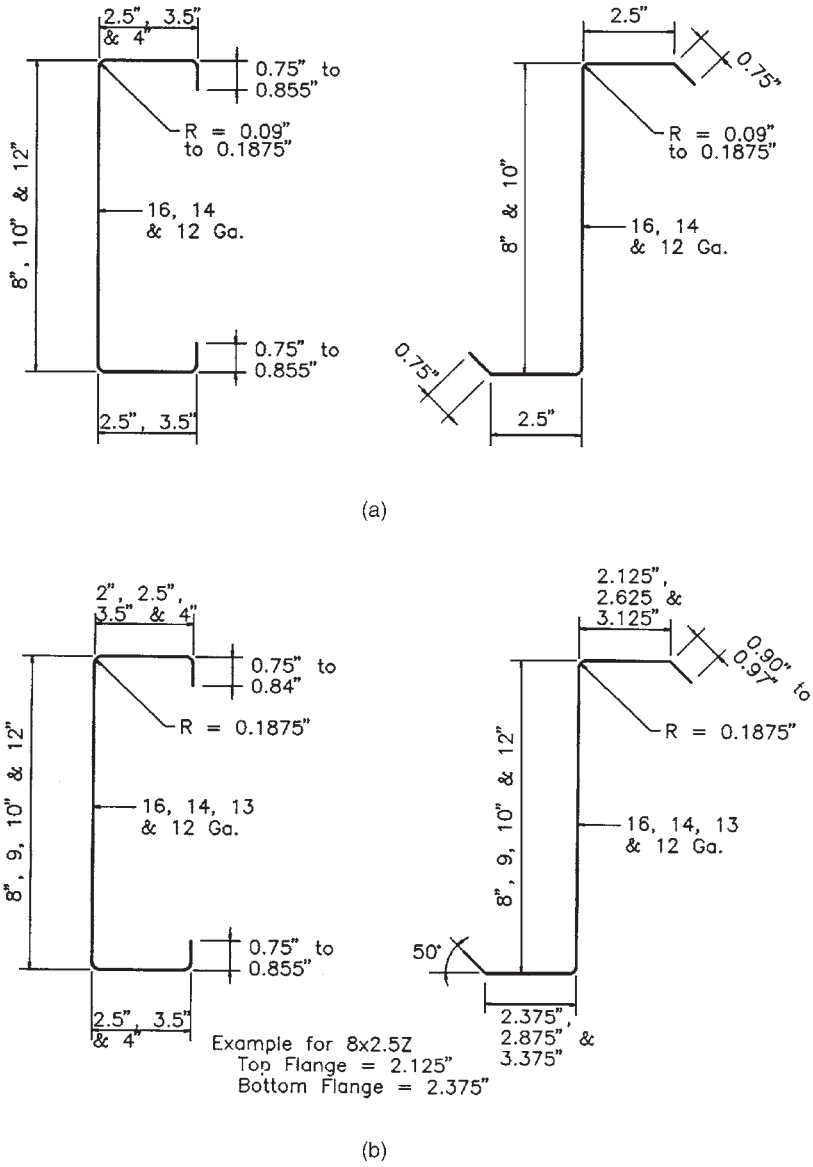

FIGURE 5.7 Typical C and Z girt and purlin sections: (*a*) used by major metal building manufacturers; (*b*) offered by LGSI members.

fastening. Light-gage C sections can be easily lapped back to back; theoretically, Z sections can be nested one inside another. In reality, however, the traditional equal-flange Z sections of thicker gages might be difficult to nest. Zamecnik[9] observes in his investigation of a warehouse with the noticeably distorted Z purlins that it is "impossible to nest [the] two sections…without bending the web of the lower purlin away from the bottom flange," a situation that contributes to undesirable rotation of the purlins at the supports (see Fig. 5.8). Noteworthy, LGSI Z sections have flanges of slightly unequal width to facilitate splicing and provide better fit.

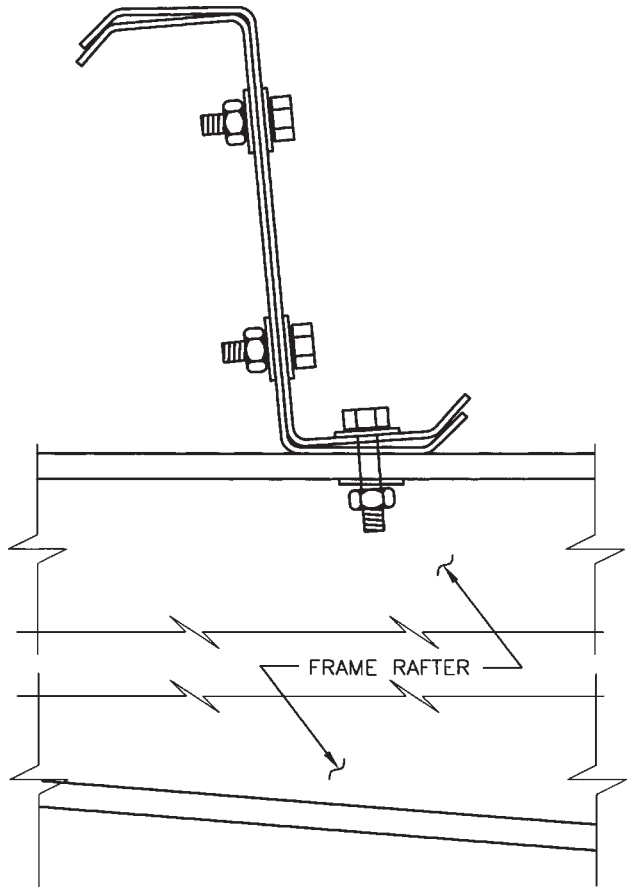

FIGURE 5.8 Forcing Z purlins of identical size one inside another at the splice causes their rotation at support. (*After Zamecnik, Ref. 9.*)

A reminder to specifiers: LGSI sections should not be forced on the metal building systems manufacturers or specified indiscriminately, since the manufacturers have their production lines geared toward their own standard members. Please investigate the availability first. Also, local steel erectors might not be familiar with LGSI sections and therefore might not be aware of the need to turn every other purlin upside down, as is needed to achieve the benefits of unequal-flange design. Erectors need to be educated on the benefits of using unequal-flange sections and on their installation techniques.

5.3.2 Design for Continuity

To achieve some degree of continuity, cold-formed sections are lapped and bolted together for a distance of at least 2 ft; i.e., each member extends past the support by at least 1 ft (Fig. 5.9). The degree of continuity may be increased with a longer lap distance, albeit at a cost of the extra material used in the lap. Some research[10] indicates that load capacity of Z purlins continues to increase until the length of the lap approaches one-half of the span, while other research[11] suggests that the limit is much smaller than that.