the ridge. This design could potentially be used for relatively narrow buildings in which bracing forces are minor. For wider structures, the required bracing sizes can make the strapping too heavy to be easily bent and crisscrossed in the field. But even for narrow roofs, the system works only if the eave struts are capable of providing purlin anchorage—a very big "if," as discussed below.

In contrast to flat strapping, angle bracing can be supplied in sections sized to fit the purlin spacing. The angles are secured to purlins by fitting precoped tabs into prepunched slots in purlin webs and bending the tabs with a hammer (Fig. 5.20). Simplicity and speed of erection are the main reasons for the popularity of this design. However, it suffers from at least two main disadvantages.

First, the design anchorage capacity of a brace connected in this manner is difficult to predict, especially for a tab that is not bent a full 90°. Second, the braces must necessarily be staggered to allow for field bending of coped legs, instead of being placed in a straight line and interconnected, as they should be. Some manufacturers stagger the adjacent sag angle pieces by as much as 12 in. Because of the stagger, the transfer of forces from brace to brace proceeds through local web bending, an undesirable situation.

A refinement of the coped-leg design, to allow for alignment and interconnection of the braces, is shown in Fig. 5.21. Instead of being bent, the coped leg of the bracing angle is inserted in the purlin slot and attached to the next angle piece. Some manufacturers provide horizontal slots (Fig. 5.21*a*), others vertical slots (Fig. 5.21*b*). The braces of Fig. 5.21 are connected with two self-drilling screws. A stronger attachment could be made by bolts (Fig. 5.22).

Still another—and perhaps better—approach is to dispense with the slotted purlins altogether and attach the angles to the top and bottom purlin surfaces by self-drilling screws, small rivets, or bolts (Fig. 5.23).

5.4.4 Anchorage of Purlin Braces at Eaves and Ridge

A simple interconnection by parallel lines of strapping or sag angles does not prevent the purlins from laterally buckling together as a group (as in Fig. 5.4). It also cannot prevent the whole assembly of purlins and roofing from lateral translation under load. Effective bracing requires anchorage at its ends—the ridge and the eaves.

At the ridge, each line of purlin bracing should be anchored to a stiff and strong ridge channel or ridge angle (Fig. 5.24). This member is designed to resist in compression the accumulated bracing forces from both slopes of the roof. Simply providing another sag angle at the ridge is usually insufficient.

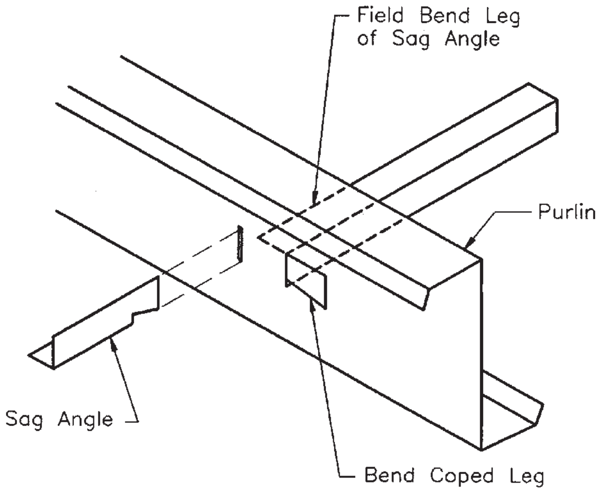

FIGURE 5.20 Purlin bracing by sag angles installed in prepunched vertical slots.

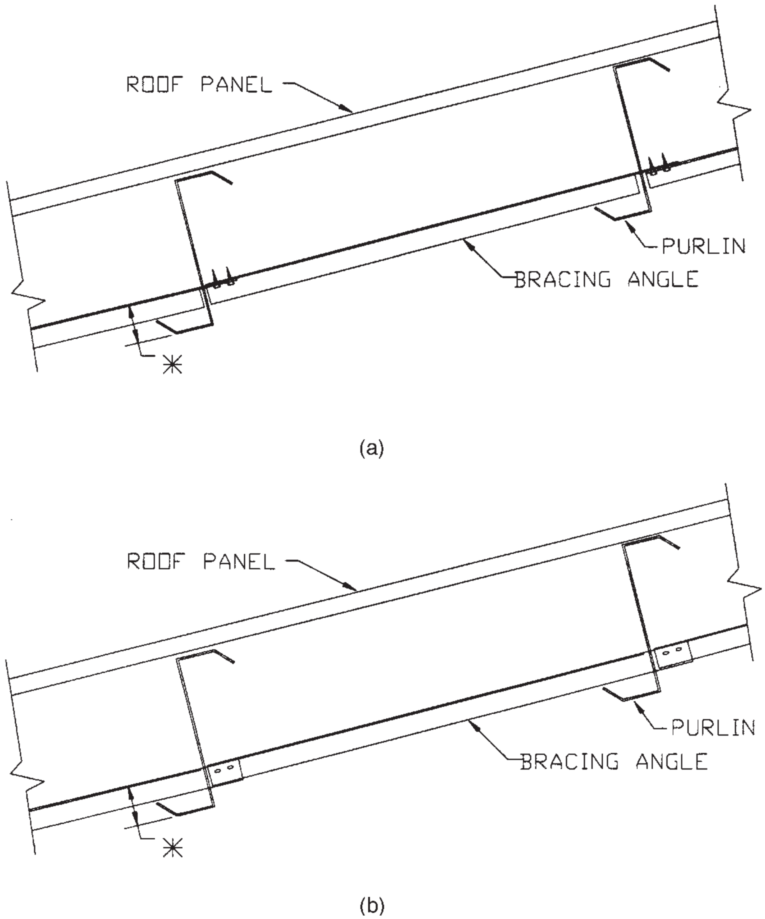

FIGURE 5.21 Lateral purlin bracing with in-line interconnected angles. Typically, such bracing is needed at top *and* bottom flanges: (*a*) using horizontal purlin slot; (*b*) using vertical purlin slot. (*LGSI.*)

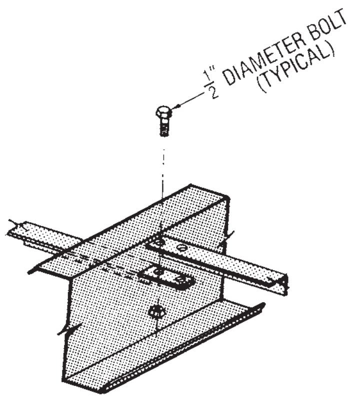

FIGURE 5.22 Bolted connection between sag angles. (Modified from a drawing by *Star Building Systems.* The company no longer uses this detail.)