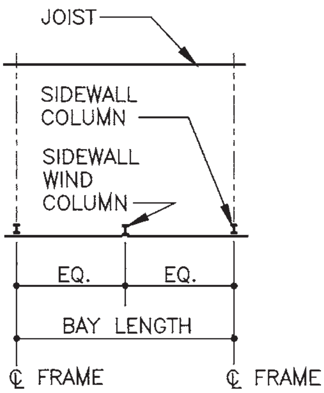

FIGURE 5.49 Sidewall wind column. (*Nucor Building Systems.*)

of resisting the substantial lateral reaction imposed by a wind column. Instead, a system of diagonal braces must be employed to transfer the lateral reaction into the adjacent primary framing, such as that shown in Fig. 5.50. Here, the brace layout consists of horizontal X-bracing made of round rods in combination with compression struts, which allows the system to resist both inward and outward wind reactions. Additional details of the system are shown in Fig. 5.51.

5.7.4 Lateral Bracing of Girt Flanges

Like purlins, cold-formed girts require lateral bracing for stability and maximum effectiveness. Unlike purlins, girts are typically braced at their exterior flanges by metal siding that is positively attached to the foundation. Therefore, the exterior girt flanges can be considered laterally braced under wind loading. Providing lateral bracing for the interior flanges is another matter. As with purlins, the outward wind pressure (suction) will subject the interior flanges to compressive stresses.

The interior girt flanges can be braced by a variety of means. Office-type buildings quite often will have an interior finish of gypsum board on steel studs or hat-channel subgirts. These members usually qualify as lateral bracing for girts. The interior of more utilitarian-looking buildings may be finished with metal liner panels that hide the otherwise exposed girts and insulation. The liner panels, as illustrated in Chap. 7, typically consist of thin-gage corrugated or ribbed sheets, through-fastened to the girts and anchored to the foundation.

If the interior flanges of girts receive no architectural finish at all, they can be braced by sag straps (or sometimes angles) attached to the foundation and the eave girt. As shown in Fig. 5.52, the sag straps can be bent to engage the interior girt flanges without additional anchorage to concrete. The attachments—and the members to which the connections are made, such as the base trim in Fig. 5.52—should of course be adequate to resist the bracing forces. They require engineering attention to complete the load path to the foundation concrete.

Example 5.2: Preliminary Selection of Wall Girts. Select a preliminary size of wall girts with flush inset to carry metal siding at an intermediate bay of a large warehouse. Use LGSI Z sections. The design wind load is 18 psf. The spacing of primary rigid frames is 25 ft. There are no interior wall finishes or partitions.

Solution. Because of the flush inset, the girts are designed as simple-span members. Assuming a 7-ft girt spacing, the wind load on a girt is

$$7 \text{ ft} \times 18 \text{ psf} = 126 \text{ lb/ft}$$

Some of the acceptable sections included in the tables of Appendix B are:

10 × 2.5 Z 13 G (Table B.20), good for 131 lb/ft, with a deflection of 2.06 in

8 × 3.5 Z 12 G (Table B.21), good for 128 lb/ft, with a deflection of 2.36 in

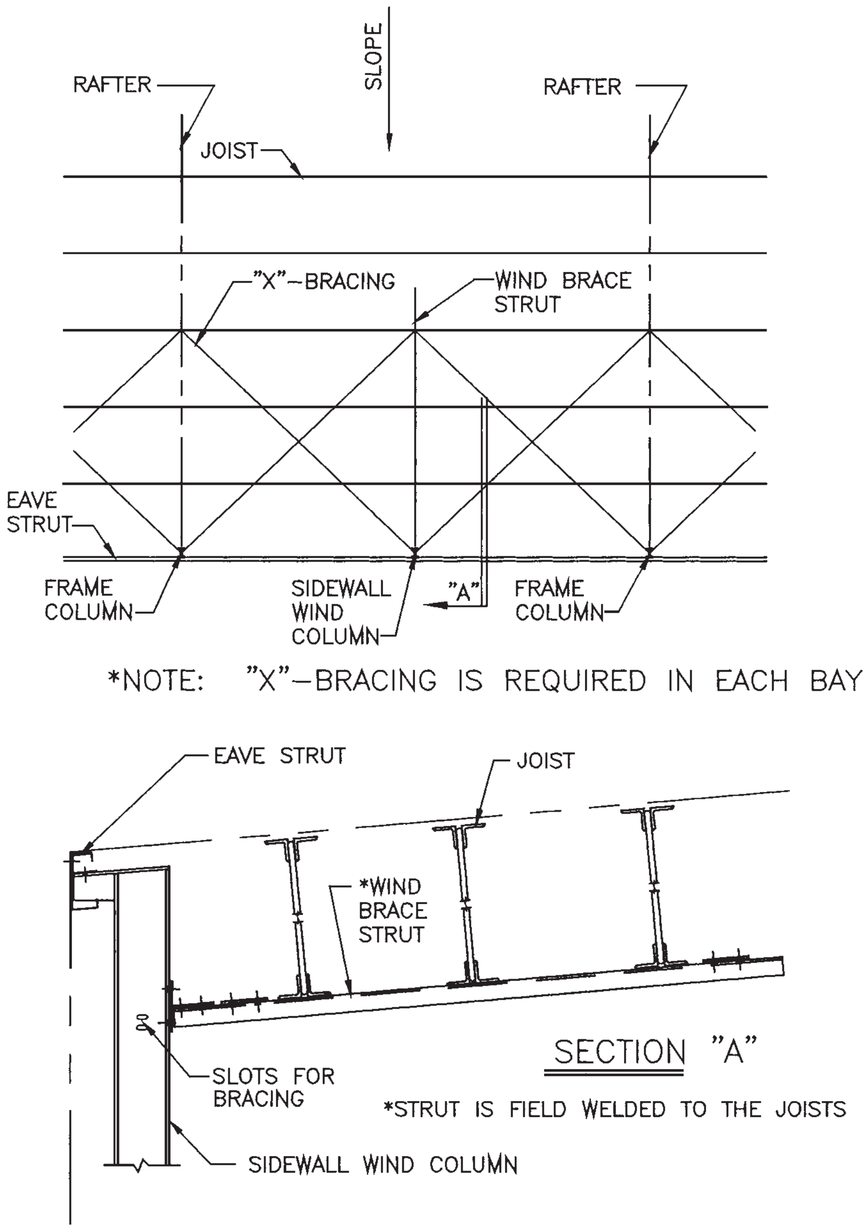

FIGURE 5.50 Lateral bracing for sidewall wind column. (*Nucor Building Systems.*)

For girts supporting metal siding without attached interior finishes or equipment, horizontal deflections are not critical, and a maximum ratio of $L/120$ may be used, as discussed in Chap. 11. The deflection of 2.36 in (the larger of the two) represents a ratio of

$$\frac{2.36}{25 \times 12} = L/127 < L/120 \qquad \text{(OK)}$$