The sample support details for loadbearing hard walls are shown in Fig. 7.17. The open-web joists can either be supported on a structural steel wall angle (Fig. 7.17*a*) or be placed in a wall pocket on a grouted bearing plate. The cold-formed purlins can be supported by brackets bolted to their webs (Fig. 7.17*b*) or bear on a steel wall angle, in which case the bottom-bearing purlins require antiroll clips or similar devices for lateral stability at supports.

7.3.4 Using Hard Walls as Shear Walls

When a hard wall is used as a shear wall, adequate force transfer has to take place from the roof diaphragm to the wall. One way to accomplish this is to connect the roof diaphragm rods to steel brackets attached to the wall. The brackets could consist of simple clip angles with holes welded to the plates bolted to or embedded into the wall (see the illustrations for Sec. 7.3.6). The rods could be welded to the brackets or anchored to them by means of hillside washers or similar devices.

When a shear wall is non-loadbearing, care should be taken not to make its attachment to the frame overly rigid in the vertical plane, while still allowing for shear transfer. Consider, for example, a shear wall next to an endwall frame. The connection has to be strong enough to carry the lateral loading between the wall and the frame, yet the wall should not be continuously connected to the frame by heavy angles or similar rigid elements that would restrain frame deflection under gravity loading.

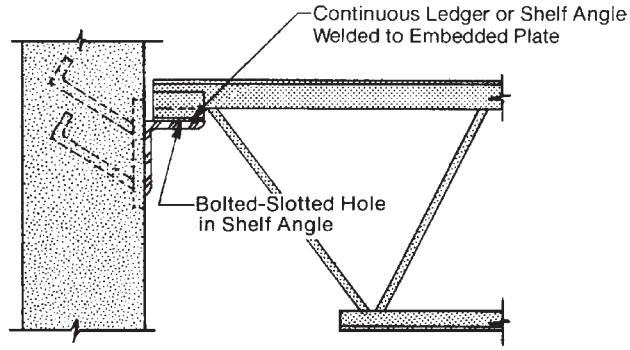

FIGURE 7.17 Joist (*a*) or purlin (*b*) connection to loadbearing precast wall. (*Star Building Systems.*)

A common manufacturer's detail for this condition is shown in Fig. 7.18. When using this detail, the connecting intermittent shear plate should be of the thinnest size possible—but still adequate for shear transfer—so as not to provide too much vertical restraint to the frame. Still, at substantial levels of frame deflections this detail may not prove very effective, because of the geometry involved.

As Fig. 7.19 demonstrates, when the frame deflects downward, the plate becomes a hypotenuse of the resulting triangle rather than its side. Accordingly, either the plate has to stretch (an unlikely scenario) or the wall must move inward to keep the plate's length constant. If the wall is unyielding, the plate or its attachments may fracture while trying to restrain the frame movement. A more effective detail uses angles with vertical slotted holes, which allow for frame movement without it pulling on the wall (Fig. 7.20).

If the hard wall is neither loadbearing nor a shear wall, its attachments to the frame need only be designed to transfer the out-of-plane wind and seismic forces, as described in the sections that follow.

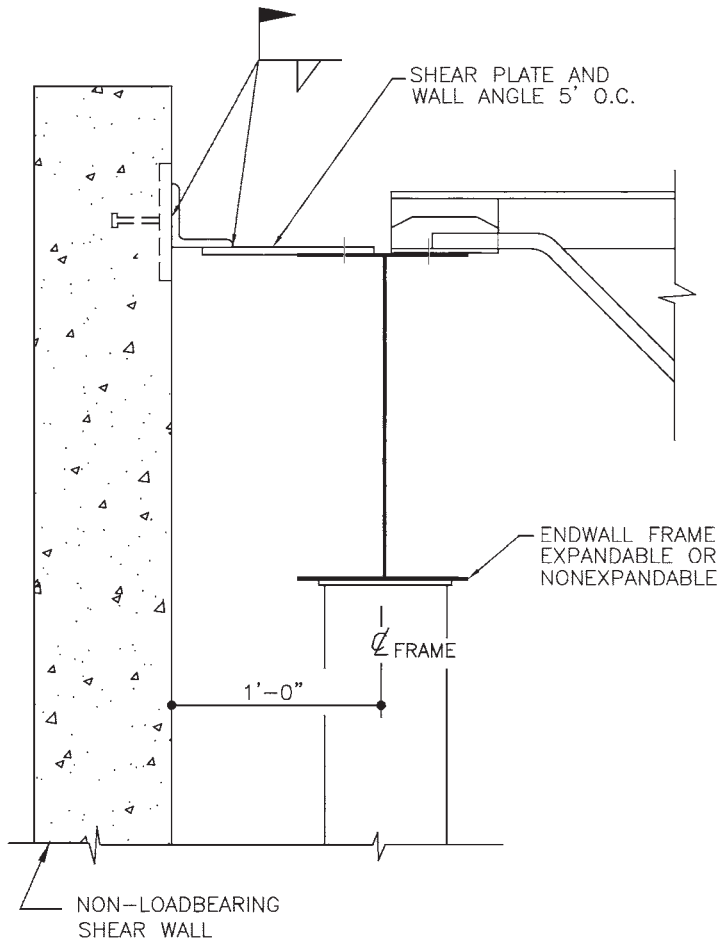

FIGURE 7.18 Attachment of nonbearing shear wall to endwall frame. (*Butler Manufacturing Co.*)