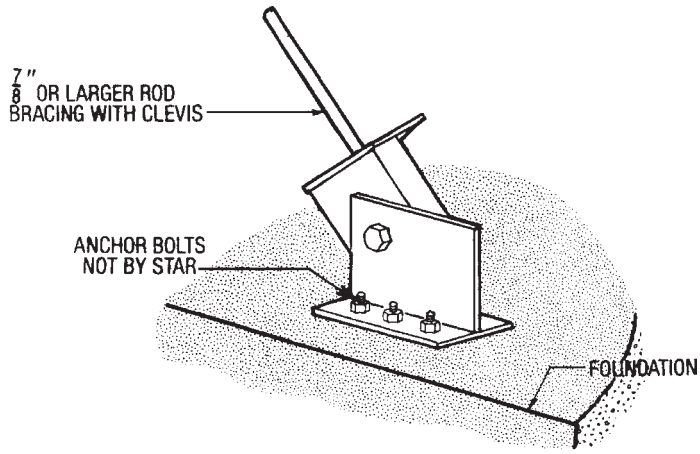

FIGURE 12.34 Anchor bolts at wall bracing clip. (*Star Building Systems.*)

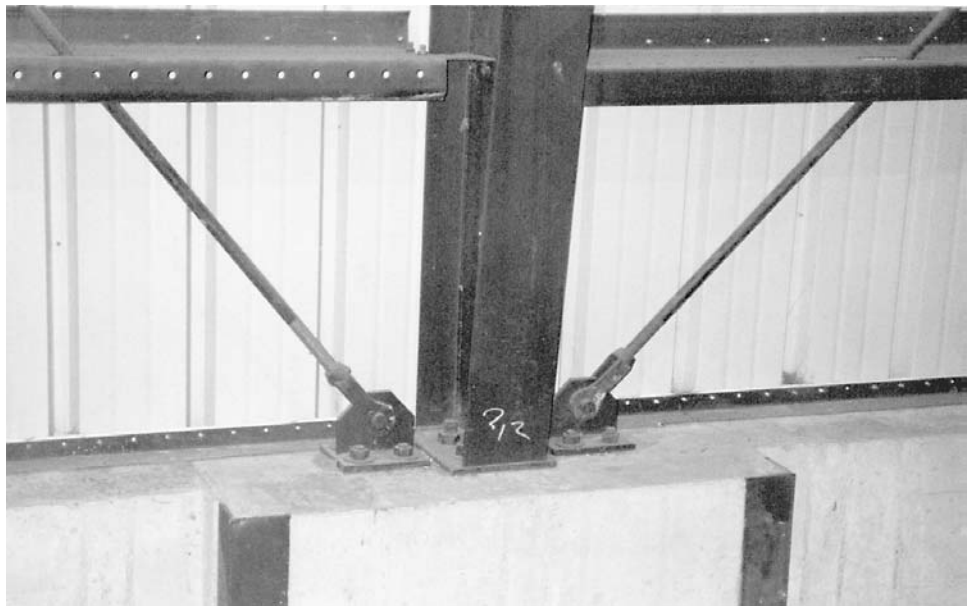

FIGURE 12.35 Enlarged column pier at foundation bracing clips.

concentrated loads are well covered in ACI 302[18] and in Ref. 20. Several items, however, are left to the designer's discretion:

- Support or isolate the slab at the exterior walls? While a commonly encountered continuous isolation joint at the perimeter sounds like a good idea for shrinkage control, it is important to remember that adequate compaction near walls is difficult to achieve. Supporting the slab on the wall and providing wall-to-slab dowels (Fig. 12.21) helps the slab to span over weak spots. The dowels

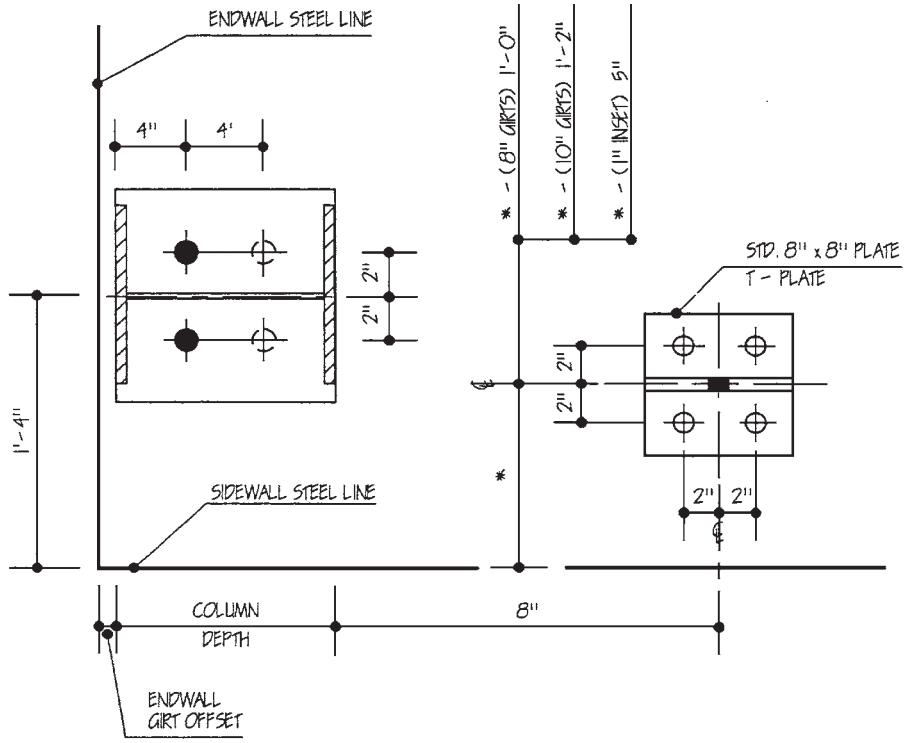

FIGURE 12.36 Location of bracing clip in relation to frame column. (Corner endwall column is shown.) (*Nucor Building Systems.*)

should be field-bent, since compaction near walls is impossible if they simply stick out from the walls horizontally.

- Reinforce the slab or not? If yes, with what? There is no specific code requirement for slab reinforcement. The familiar welded wire fabric (WWF) is intended to minimize the width of shrinkage cracks but not to eliminate them. The same result could be achieved by a close spacing of control and construction joints, by using deformed reinforcement, or by specifying shrinkage compensating (type K) cement. If used, wire mesh or rebars should be properly supported by special bolsters or, better yet, by closely spaced concrete bricks made of the same type of concrete as the slab. The issue of whether to stop welded wire fabric at the slab control joints was debated in Sec. 12.5.2. A common control joint detail is shown in Fig. 12.40.
- How close to space control and construction joints? Clearly, the closer the spacing, the less anticipated shrinkage. Too close a spacing, however, will increase a cost of the joints and their future maintenance. As a practical rule, the joints are spaced from 15 to 25 ft apart in each direction, hopefully coinciding with the column layout. Depending on a joint spacing, the required amount of shrinkage steel can be determined from the Drag Formula in ACI 302.[18] While in the past slabs were commonly placed in a checkerboard fashion, present-day practice is to use the long-strip method, whereby the slab is cast in alternate strips 20 to 25 ft wide and later divided into squares by control joints. One lesson the author has learned in this regard is not to place construction and control joints parallel to each other: Construction joints tend to absorb the total amount of slab movement leaving control joints uncracked and thus ineffective.
- What type of construction joints to specify? Of the two basic types of construction joints—keyed and doweled—the doweled joints (Fig. 12.41) seem to result in a better load transfer between