

FIGURE 12.37 Detail of portal frame base plate. (Nucor Building Systems.)

adjacent slab sections. Careful installation and alignment of the dowels is critical, as misaligned dowels may impede slab movement and induce cracking. Keyed joints are prone to spalling. Diamond-shape isolation joints placed around the columns may reduce cracks in that area.

- What surface finish and tolerances to specify? Slab tolerances are a common source of confusion. Previously, a slab was considered acceptable if a gap under the 10-ft straightedge did not exceed $1/8$ in. The present-day requirements are much more complex, involving two so-called F numbers: F_F , which measures flatness or waviness of the floor, and F_L , which controls slab levelness. These F numbers are used by ASTM E 1155²¹ and have been adopted by ACI 117.²² A good introduction to the subject is given by Tipping.²³

Quality slab-on-grade construction does not come cheap. Ruddy¹ observes that slab accounts for 5 to 18 percent of a total building cost. The lower end of the spectrum applies to office-type occupancies, while the high end relates to manufacturing facilities with special floor toppings. A cost of some high-performance metallic or emery toppings may greatly exceed the cost of the slab itself.

REFERENCES

1. John L. Ruddy, "Evaluation of Structural Concepts for Buildings: Low-Rise Buildings," BSCE/ASCE Structural Group Lecture Series at MIT, Cambridge, MA, 1985.
2. *BOCA National Building Code*, 14th ed., Building Officials and Code Administrators International, Inc., Country Club Hills, IL, 1999.
3. *Metal Building Systems*, 2d ed., Building Systems Institute, Inc., Cleveland, OH, 1990.

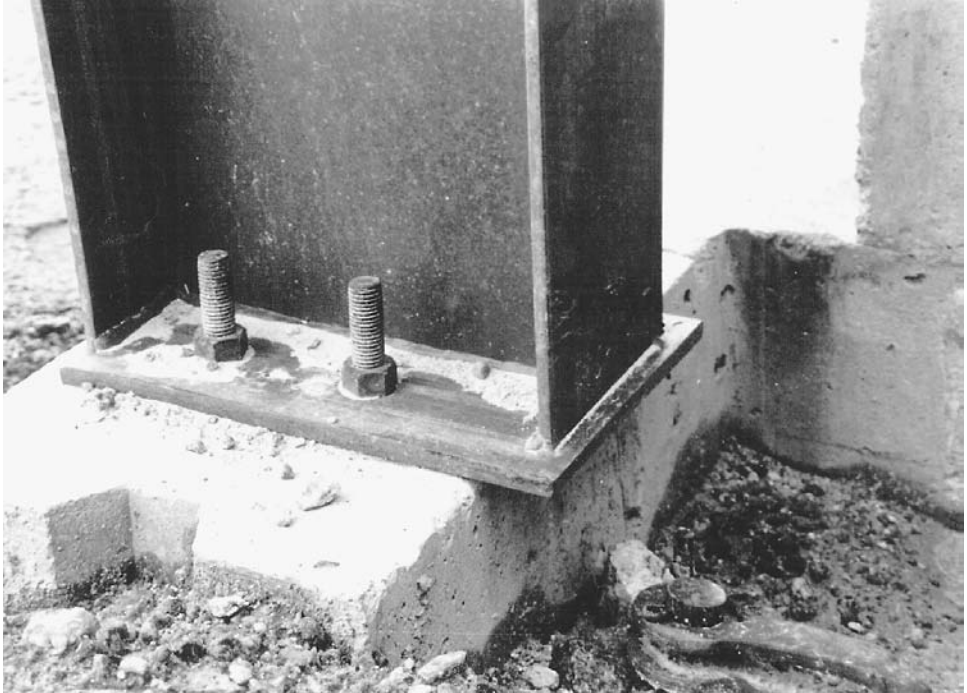


FIGURE 12.38 A column designed without regard to foundation size.

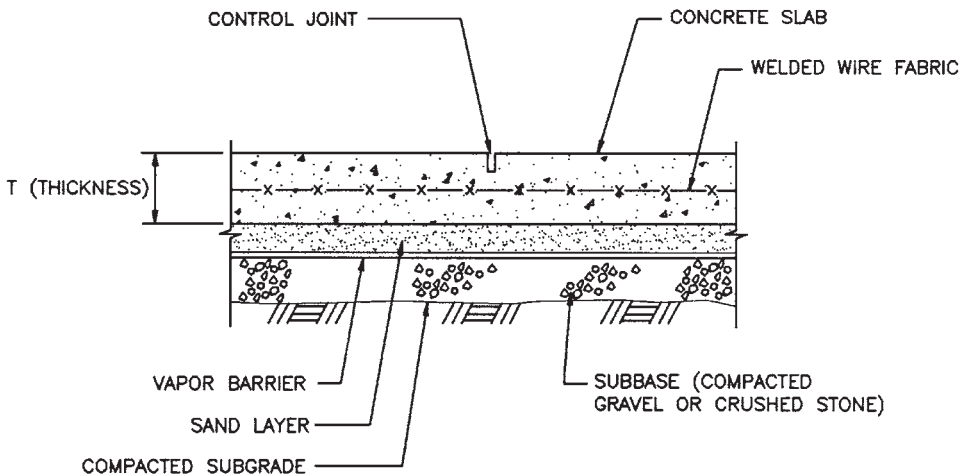


FIGURE 12.39 Components of slab on grade.