REVIEW QUESTIONS

1 Which document should be submitted by the manufacturer to demonstrate compliance with the contract documents?

2 Name at least five items that should be specified in the contract documents.

3 Explain how the manufacturer typically learns about specific contract requirements.

4 What might be some of the problems awaiting the owner who chooses not to engage an outside architect-engineer in the project?

5 What third-party certification program is available to the manufacturers of metal buildings?

6 Is building insulation typically included in the manufacturer's scope of work?

CHAPTER 10
SOME COMMON PROBLEMS AND FAILURES

Time after time, those who specify metal building systems face the same troublesome issues that cause more than their share of problems. These issues deserve close attention of the specifiers. Most troubles are rooted in misunderstanding or miscommunication between the owner and the owner's design team on one side and the manufacturer and the builder on the other. Every one of this chapter's vignettes has been inspired by an actual not-so-pleasant occurrence. A brief review of metal building failures—the ultimate problems—completes our discussion.

10.1 SPECIFYING BUILDINGS WITH COMPLEX SHAPES AND WALL MATERIALS

10.1.1 Building Too Small

Sometimes, metal building systems are specified for inappropriate applications, where their advantages cannot be fully utilized. The systems are best suited for large rectangular low-rise buildings, especially those that can benefit from metal panel walls and roofs (see Fig. 1.3 in Chap. 1). Still, time and again, pre-engineered structures are provided for small buildings with irregular layouts, complex roof shapes, and varied wall materials—with the results mixed at best. Whenever such conditions apply, a rule of thumb puts a minimum footprint of the buildings suitable for pre-engineered construction at about 3000 sq. ft. While some smaller buildings have been successfully constructed, they might have been built even more economically with some other framing systems identified in Chap. 3.

To be sure, there are manufacturers that specialize in production of simple rectangular stand-alone metal buildings at very competitive prices. Our focus, however, is on custom-designed structures, perhaps with some special architectural features.

Manufacturers often find that small buildings with complex layouts require careful engineering and no less effort than the large simple boxes. This engineering and detailing time, as well as mobilization and transportation costs, are difficult to amortize on small structures (Fig. 10.1). For all these reasons, major manufacturers rarely pursue minor construction in distant areas, leaving such buildings for their smaller competitors who, unfortunately for the owners, might not be experienced with custom applications of metal building systems. A common result is a host of engineering and coordination issues which confront the owner and builder, the issues that a more experienced manufacturer could have easily resolved.

10.1.2 Complex Configuration

Large buildings of complex shapes can present a problem, too. Many design programs used by manufacturers are geared toward rectangular structures. A C-shaped building, for example, can be broken