March 30, 1992

12 x 21 x 5.5 m (40' x 70' x 18')
LMDS .25:12 slope
Warehouse expansion
Grand Rapids, Michigan
BMC Ord.Nos.052789,052790
Builder Order Ref: CB 8673

Mr. John Doe
XYZ Corporation
Grand Rapids, MI 49508

To Whom It May Concern:

Please accept this letter as our certification that the Butler components of the subject building are designed in accordance with the **1989 Edition of the AISC Specification for the Design, Fabrication and Erection of Structural Steel and the 1986 Edition of the AISI Specification** for the Design of Cold-Formed Steel Structural Members. The basic loads of the subject building meet or exceed the County Climatic Data as published in the **1986 Edition of the MBMA Low Rise Building System Manual.**

The governing design code is the 1987 Edition of the BOCA National Building Code. The following loads are applied in accordance with the governing code:

Roof Snow Load	1436 Pa (30 psf)
Wind Speed	129 km/h (80 mph)
Wind Exposure	B
Seismic Zone	1

The building system is designed for a drift snow load applied in accordance with the Low Rise Building Systems Manual which meets or exceeds the governing code. Load combinations are in accordance with the governing code.

This building has been reviewed for an 363 kg (800 lb) concentrated load at the midspan of the 6 m (20 ft) long beam trusses in addition to the full 1436 Pa (30 psf) snow load.

These Butler components, when properly erected on an adequate foundation in accordance with the erection drawings as supplied and using the components as furnished, will meet the above loading requirements. The design of this building for wind load assumes that doors not supplied by Butler are designed to sustain the same wind pressures and suctions as the walls in which they are installed. This certification does not cover field modifications or design of material not furnished by Butler Manufacturing Company.

This building is produced in a manufacturing facility that is certified by the American Institute of Steel Construction—Category MB.

Cordially Yours,

Duane Miller, P.E.
Division Engineer

FIGURE 9.4 Sample letter of certification. (*Butler Manufacturing Co.*)

THE PROCESS OF BUYING A METAL BUILDING

9.6 SHOP DRAWINGS AND CONSTRUCTION

One of the first pieces of information the manufacturer should submit to the owner's designers is the value of column reactions. As mentioned already and discussed further in Chap. 12, metal building foundations are often designed prior to receiving these data from the manufacturer and are rechecked later against the actual reactions. This process is on the critical path, and such submittal is required as early as possible, preferably at the bidding stage. In any case, it should not take the manufacturer longer than 2 weeks to process the order plus a week to generate the reactions. Thus the reaction report, such as that shown on Fig. 9.5, and perhaps even a complete approval set, might be ready in 3 weeks.

The approval set may include an erection plan, frame elevations, anchor bolt plan, wall elevations, and some details. (What the set includes should have been specified in the contract documents and, hopefully, in the order documents prepared by the builder.) An example of frame elevation is shown in Fig. 9.6; an anchor bolt plan may be found in Chap. 12. The approval set might not be drawn to scale but is still a source of valuable information; it should be closely scrutinized for any hints of misunderstanding the design intent. For example, on one project the first item submitted for review by the architect-engineer was an anchor bolt plan. The drawing was accompanied by a transmittal marked "RUSH!!" However, instead of quickly stamping the plan "Approved," the reviewing engineer took some time examining it and noticed that each column was shown to have 8 anchor bolts. The engineer suspected that the manufacturer intended to use fixed-base columns instead of pin-based as specified. The suspicion was investigated and proved correct. By that time the foundations were already in place, and a serious problem was averted.

The submittal should also include detailed structural calculations sealed by the manufacturer's engineer. Some owners insist that the engineer be registered in the state where the building is located and include this requirement in the contract documents. MBMA's *Common Industry Practices* requires only that the engineer be registered in the manufacturer's home state.

While reputable manufacturers tend to submit calculations with clearly identified assumptions and input data, some others might try to overwhelm the reviewers with mounds of incomprehensible computer data. Those submittals might look as if they were, in Tom Clancy's words, written by computers to be read by calculators. If anything looks suspect, asking questions in writing and insisting on strict adherence to the design requirements is warranted. (On at least one project, a manufacturer stated that the building complied with the project's strict lateral drift criteria. The calculations indicated otherwise.)

Do not be surprised to see that any marked-up comments on the approval set are construed as changes and greeted with a change order by the manufacturer. Some three-way complex negotiations might ensue. The reader is invited to review Secs. 2.2 and 3.3.3 of MBMA's *Common Industry Practices* which deal with such changes. In some unfortunate circumstances, the project might stop in its tracks right there and end in dispute.

The approval set, however schematic, is the first and usually the last occasion to review the manufacturer's shop drawings. The detailed work prepared afterward constitutes fabrication drawings that are not generally furnished by the manufacturer unless specifically required by contract. With all the shop drawing issues resolved, construction can, at last, start. Some "red flags" to be watched out for during construction are described in Chap. 16.

REFERENCES

1. Alexander Newman, "Engineering Pre-engineered Buildings," *Civil Engineering,* September 1992.
2. Duane Miller and David Evers, "Loads and Codes," *The Construction Specifier,* November 1992.
3. Shawn Zuver, "Span Construction & Engineering Wins Fifth Top Builder Honor," *Metal Construction News,* May 1995.