In contrast, steel members produced without heat application, or cold-formed, are in the AISI domain. Today, AISI is a recognized authority in the field of cold-formed construction. Cold-formed framing is made from steel sheet, plates, or flat bars by bending, roll forming, or pressing and is usually confined to thinner materials. Some examples of cold-formed shapes used in construction include metal deck, siding, steel studs, joists, and purlins—the "meat and bones" of pre-engineered buildings. These structural members are usually less than $^3/_{16}$ in in thickness and are known as "light-gage" framing.

Most components of a typical metal building system, such as secondary members and wall and roof covering, are likely to be governed by the AISI provisions; the main steel frames, by AISC specifications.

While the *AISC Manual*[6] can be found on the bookshelves of most structural engineers, the *AISI Manual* is less known, perhaps because cold-formed structures have been traditionally designed outside of consulting engineering offices. Indeed, most consulting engineers deal predominantly with stick-built structures that utilize familiar off-the-shelf hot-rolled members.

The heart of the *AISI Manual* is what was formerly called Specification for the Design of Cold-Formed Steel Structural Members.[7] The Specification was first published in 1946 and has been frequently revised since, often drastically, reflecting the rapidly developing state of knowledge in cold-formed design. The original Specification was developed largely from AISI-funded research at Cornell University under Dr. George Winter and at other institutions in the late 1930s and early 1940s. The current code development is in the hands of the Committee on Construction Codes and Standards. In 2002, the Specification's name was changed to the North American Specification for the Design of Cold-Formed Structural Members. Accordingly, it applies to the design of cold-formed structures in the United States, Canada, and Mexico. Design provisions common to all three countries are included in the main part of the Specification; the country-specific items are included in the appendices.

The Specification includes design procedures for various stiffened and unstiffened light-gage structural members, provides detailed design criteria for connections and bracing, and describes the required tests for special cases. The Specification's equations are used by manufacturers and fabricators of pre-engineered buildings, steel deck, siding, and steel studs and are utilized in numerous nonbuilding applications such as steel vessels and car bodies. Some Specification provisions are discussed in Chap. 5.

The *AISI Manual* also contains a commentary, reference data, and design examples explaining and illustrating the Specification.

In addition to publishing the *Manual,* AISI is involved in technical education efforts and promotional activities. The Institute's network of regional engineers is ready to answer technical questions from the specifiers and code officials. The AISI Construction Marketing Committee is actively promoting targeted areas of steel construction. A major marketing program undertaken by the committee that included direct mail, presentations at construction conventions, and one-on-one marketing was largely responsible for the huge success of metal roofing systems.

The Institute is also engaged in many other activities such as representing all of the steel industry before the lawmakers and the executive branch.

American Iron and Steel Institute is located at 1101 17th Street, NW, Suite 1300, Washington, DC 20036-4700; its telephone number is (202) 452-7100, and its website is www.steel.org.

2.4 METAL BUILDING CONTRACTORS & ERECTORS ASSOCIATION (MBCEA)

As the name suggests, this trade group represents contractors and erectors of metal buildings. It was formed in 1968 as Metal Building Dealers Association (MBDA); the name was later changed to System Builders Association (SBA). The latter sounded lofty but somewhat confusing, and the group's name was changed again in 2002, to better reflect the occupation of its members. MBCEA offers several membership categories for builders, independent erectors, metal roofing contractors, light-gage metal framers, suppliers, and even design professionals.

Many MBCEA activities take place at local chapters, where competitors by day join in the evening to discuss common challenges and to exchange information. At the national level, MBCEA offers legal help to contractors and erectors of metal buildings on the matters of contracts, liens, collection problems, and the like. It also publishes several standard legal forms, such as a Standard Form of Agreement between contractor and client, a Subcontractor Agreement, and a Proposal-Contract.

MBCEA maintains a certification program, awarded to companies deemed to possess significant knowledge and experience in the metal building industry, as well as to demonstrate honesty and integrity. The association has formed the Metal Building Institute (MBI) as a separate nonprofit educational and training organization. MBCEA sponsors annual trade shows, conferences, seminars, and social events and publishes a magazine for prospective clients.

Metal Building Contractors & Erectors Association's address is 28 Lowry Drive, P.O. Box 117, West Milton, OH 45383-0117; its telephone number is (800) 866-6722, and its website is www.mbcea.com.

2.5 NORTH AMERICAN INSULATION MANUFACTURERS ASSOCIATION (NAIMA)

North American Insulation Manufacturers Association represents major manufacturers of fiberglass, rock wool, and slag wool insulation. NAIMA, which traces its roots to one of its predecessor organizations established in 1933, seeks to disseminate information on proper application, performance, and safety of insulation products. Like other similar trade groups, NAIMA conducts both technical-education and promotional affairs.

Since the group's interests go well beyond metal building systems, it is NAIMA's Metal Building Committee that sets performance standards and establishes testing programs for insulation products used in pre-engineered buildings.

Among the most valuable NAIMA's publications applicable to metal building systems are:

- Understanding Insulation for Metal Buildings
- ASHRAE 90.1 Compliance for Metal Buildings
- NAIMA 202 Standard

North American Insulation Manufacturers Association is located at 44 Canal Center Plaza, Suite 310, Alexandria, VA 22314; its telephone number is (703) 684-0084, and its website is www.naima.com.

2.6 METAL CONSTRUCTION ASSOCIATION (MCA)

Established in 1983, MCA was formed mainly for promoting the wider use of metal in construction.[3] MCA's best-known contribution to this goal is its annual *Metalcon International,* a major trade show that represents the entire metal building industry from around the world. MCA has its own Merit Award Program, bestowing honors on the projects it judges noteworthy, publishes a newsletter, and conducts market research.

MCA's market research activities include gathering and disseminating information on emerging and growing market segments and on promising new uses of metal components. The group's annual Metal Roof and Wall Panel Survey tracks use of metal panels by installed weight and square footage. To discuss a few specific areas of interest to only some of its members, MCA sponsors its Industry Councils—Light Frame, Construction Finishes, and Architectural Products/Metal Roofing and Siding. The membership is open to any person or company involved in the manufacture, engineering, sale, or installation of metal construction components.

Metal Construction Association is located at 4700 W. Lake Avenue, Glenview, IL, 60025; its telephone number is (847) 375-4718, and its website is www.metalconstruction.org.