Chapter 1
Introduction to *The CSI Project Delivery Practice Guide*

1.1 Introduction

Designing and constructing buildings, civil structures, industrial facilities, interior design projects, and other structures and facilities is one of humankind's most difficult endeavors in spite of the fact that it is a common activity. All facilities start as a project that takes a journey through a sophisticated and complex process in order to come into being. Talented individuals with advanced education, specialized knowledge, well-developed decision-making abilities, and in some cases professional licenses are required to manage, direct, and monitor the process. All that talent and skill has to be marshaled and brought together to converge on a common goal of producing a project. Then a considerable amount of both time and money are required to accomplish the goal. Yet out of the need for shelter, protection, and comfort, we design and construct facilities to house the activities of our private and public lives, both individually and socially. We aspire to create facilities that are useful, functional, visually pleasing, and enjoyable to occupy.

This journey is called the project delivery process, and this practice guide presents the many pieces and parts that compose that process. While this practice guide is not about creating and designing facilities, it is about the logistics of project delivery from conception to occupancy. It provides insight into the vast array of activities that are either required or necessary in the delivery process. Not every concept presented in this practice guide will be necessary for every project. The information contained in the practice guide is useful to anyone, at any level, who owns, designs, engineers, constructs, installs, supplies, or manages a facility.

1.2 Understanding Project Delivery as Foundational Knowledge

The purpose of this practice guide is to educate individuals about project delivery from the global, or big picture, perspective. Project delivery is not specialized, like designing or constructing; it is generalized. Understanding the concepts of project delivery allows

stakeholders and participants to be able to provide more effective services no matter what delivery path the project takes. While there are six project delivery methods identified in this practice guide, the reality is that there are as many variations of these project delivery methods as there are individuals that make project decisions.

This practice guide is the foundation for all of the other practice guides developed and published by CSI. The ideas, concepts, and information presented in the other practice guides builds on this practice guide to present more specialized information about other topics. For example, developing a working understanding of *The CSI Construction Specifications Practice Guide* and *The CSI Construction Contract Administration Practice Guide* depends on first understanding the information of *The CSI Project Delivery Practice Guide*.

Every individual that is a stakeholder or participant in the design and construction of anything in the built environment should have a foundational understanding of how projects are delivered. An understanding of the information in this practice guide as an introduction to project delivery is important. Much of what design and construction professionals do is founded on the information presented in these chapters.

As will be seen, successful project delivery depends on the melding of the following aspects into a process with a specific purpose:

- An owner that has a defined plan for a facility
- Individuals, firms, and companies to produce the design and make the appropriate decisions
- Contracts that comprehensively and effectively establish and define the roles and responsibilities of the stakeholders and participants
- Well-developed and sufficient construction documentation
- Organized construction project management and scheduling
- Individuals and companies to provide and install the required materials

1.3 Magnitude of Design and Construction Information Available

Information that is available about the design and construction of projects and facilities has advanced light-years over the last several decades. For example, in the 1970s, when information was needed about a product, material, or construction technique—if it existed at all and could be found by telephone calls to possible sources—it was only as immediately available as waiting on the mail to be delivered. There were few books, few periodicals, and few resources, and the information that was available was not easily found.

Today, there is an enormous amount of design and construction information available instantly, and it is growing at an astonishing rate. Individuals are being flooded every day with an ocean of information from many sources. For those random instances when information is not immediately available, it can usually be generated in a short time and immediately made available to the one requesting the information. Essentially, there are numerous sources for everything anyone would want to know at any time.

There is a relatively small and exclusive class of inventions that has fundamentally changed society's ability to communicate, which has revolutionized the nature of information, knowledge, and understanding. The printing press, electricity and the countless devices it powers, capturing and creating images (photography, television, recordings,

etc.), and wired and wireless communication capabilities are a few of the most significant inventions. A case could be made that information overload began with Gutenberg's invention of the printing press. Now, the amount of information that is available through the Internet is staggering—it has forever changed the nature of knowledge. One of the reasons the Internet is significant is that information is now available to anyone, anywhere, anytime. The Internet has become the preferred method for accessing information about the design and construction of the built environment.

1.3.1 Books

Throughout human history, there have always been those that want to make their knowledge available to others. However, the opportunity to do so has been limited by the means of producing it for consumption by others. We know that the printing press fundamentally changed that. Today, the technology to publish books is widely available, and there is now a huge volume of books available on a limitless number of topics from many different sources. While the breadth of knowledge may not be as extensive as the Internet, there is nevertheless a massive amount of information available.

While books capture knowledge, one of their major limitations is that books only capture knowledge through a specific point in time (usually six months or so prior to publication because of prepublication production). It is not until a new edition is published that the knowledge contained in a book can be advanced, improved, updated, or expanded. Other limitations include the distribution and availability of books. Unless a book is purchased via the Internet, the availability of books still depends on shipping, stocking, and shelf display to be available to purchasers. Books face an uncertain future and will in all likelihood give way to Internet-based information.

1.3.2 Periodicals

There are a number of periodicals available for a vast range of specialized design and construction topics. In fact, a periodical can probably be found for just about any subject. Increasingly, they are available on the Internet as well as in printed editions. Unlike books, periodicals are published frequently and have the capability to be more current. An asset of periodicals is that they can be archived and thus accumulate a sizeable body of specialized knowledge. Many professional and trade associations publish periodicals for their members, and their periodicals are usually available to anyone who is interested.

1.3.3 Professional Associations, Societies, and Institutes

A profession is a vocation or occupation in which individuals obtain specialized, extensive, and advanced education or training for the purpose of supplying unbiased counsel or service to others for compensation. A license is frequently required, based on a competency examination that is administered by a governmental jurisdiction (usually a state), before an individual can be legally identified as a professional of a particular discipline. The same jurisdiction establishes and enforces licensing laws that regulate professional practice and conduct. Once licensed, a professional is legally obligated to practice in such a manner as to protect the public and to perform services within the scope of the

licensing laws. Professionals should exercise reasonable care and competence by applying the same technical knowledge and skill ordinarily applied by reasonably prudent professionals practicing under similar conditions and circumstances.

An association is a group of professionals, and those aspiring to be professionals, who voluntarily agree to be a part of an organization for the purpose of pursuing common interests and to promote the status of the membership. Also known as societies and institutes, a professional association is composed of professionals who are practitioners of a particular occupation, skill, or discipline who promote the advancement of knowledge of their profession. Since professionals are licensed by a jurisdiction, a professional association complements the jurisdiction by providing oversight of their members and monitoring professional activities.

The advancement of specialized knowledge is important to a professional association. Significant effort is expended to develop, collect, evaluate, and disseminate intrinsic knowledge for the benefit of professionals and the public. Because professionals are usually involved with disciplines in which knowledge evolves based on research, experience, and technical developments, most professional associations, as well as licensing jurisdictions, require a commitment from professionals to continuing their education to remain aware of new developments as well as issues and challenges facing the profession.

1.3.4 Standards

Standards establish uniform guidelines, criteria, methods, processes, and practices for a particular building product, assembly, or technology and are covered in more detail in Chapter 4.

1.3.5 Trade Associations

Trade associations are organizations of companies that compete with each other in a particular business or industry and are primarily interested in advancing their products and services. Activities of trade associations include the development of management practices, enforcement of ethics, promotion of their members, and public relations. Trade associations often establish and maintain skill certifications for technicians and they provide a valuable service to society by policing their respective businesses and industries.

Trade associations make an important contribution to the design and construction of facilities because they frequently originate, maintain, and distribute technical standards that, while voluntary, govern the manufacture, fabrication, and installation of products, materials, and equipment. Also, technical publications, newsletters, and customer service departments may be available for the purpose of education and advancing an understanding of practices that may be unique to an industry. Because they have the most knowledge and understanding of their products and work, trade associations are considered to be the authority of that industry. Their standards are frequently the basis of construction specifications.

1.3.6 Manufacturer Associations

In some industries, manufacturer associations are similar to professional and trade associations except they are a consortium of manufacturers that promote the interests of their industry

through member distributors, wholesalers, retailers, other associations, and installers. Through consensus among members, they work to improve the quality of their products.

1.3.7 Research Agencies

While not as extensive as trade and manufacturer associations, there are independent agencies that research building products, materials, and equipment. Effort is expended for the purpose of understanding and improving the nature of the design and construction of facilities.

1.3.8 Manufacturers

Manufacturers that supply materials, products, and equipment for the construction of facilities are a vastly diversified group and are essentially spread over the entire planet. In addition to being in the business of selling their products, manufacturers are motivated to advance a better understanding of the products they manufacture and they make a significant contribution to the advancement of knowledge of the design and construction of facilities. Manufacturers have a vested interest in purchasers and users understanding the qualities, characteristics, and potentials of their products. Manufacturer representatives are a crucial part of communicating technical information, and they provide a valuable service to other stakeholders and participants.

One of the most noticeable manifestations of the explosion of information in the design and construction professions and industries directly involves manufacturers. In years past, the most effective method of making information available was the distribution of hundreds of product information ring binders that have become synonymous with designers. Today, the number of ring binders in offices is decreasing as manufacturers make their information available over the Internet.

There are several other important contributions made by manufacturers. It is common for manufacturers to make their research-and-development departments available for inquiries, and they strive to provide high-quality customer service not only for owners, but for designers and constructors as well. Some manufacturers demonstrate a commitment to the quality of their products by certifying, licensing, or approving those individuals and companies that install them.

1.3.9 Continuing Education Opportunities

Common to all of the organizations described above are the continuing education opportunities available for individual or in-office presentations; local, regional, state, and national conferences; Internet webinars, and design or trade publications. Most professionals are required by professional associations and licensing jurisdictions to take a specified number of continuing education sessions. The number of opportunities available is extensive and easily accessible.

One of the longest-running programs, offering continuing education since 1949, is the Department of Engineering Professional Development program at the University of Wisconsin at Madison. There are many classes offered covering building codes; commissioning; construction; heating, ventilating, and air conditioning (HVAC); electrical; plumbing; fire protection; structural; high-performance buildings; and green buildings.

1.4 Managing Information

It is well known that information is one of our most valuable commodities, and it is expanding at what seems to be a logarithmic pace. Information about the design and construction of facilities is no exception. We live in a time when the amount of knowledge we need to possess about what we do increases every day. Like never before, it is of utmost importance to understand how to manage the information that is required of stakeholders and participants in the design and construction of facilities. This process is information intensive from project conception to occupancy, and continues for the life of the facility. The need for information management is especially important for product representatives and specifiers.

A computer and a connection to the Internet empowers individuals in profound ways and permits an ability to seek knowledge without limitation. Therefore, managing information has become a common part of the life of a professional. Managing information requires skill in finding, filtering, evaluating, and storing the information necessary to accomplish the design and construction of a facility. Important considerations for managing information and converting it to knowledge include the following:

- Is the information relevant sufficient, and accurate?
- Is the information timely?
- Is the information from a trustable source?
- Is the information a fact (verifiable), opinion (requires interpretation), or propaganda (not verifiable)?
- Is the information supported by other information or evidence?
- Is the information related to authoritative sources, such as a standard?

Knowledge empowers individuals, and acquiring knowledge is an individual responsibility. The knowledge necessary to succeed in any endeavor can be found in four realms:

1. *What We Know.* Personal education and training; lessons learned from personal experiences; resources we absorb and understand
2. *Resources within Reach.* Books, periodicals, articles, and research in our personal libraries
3. *Accessible Information.* Information accessible over the Internet or from others
4. *Whom We Know.* Colleagues, manufacturers, manufacturer's representatives, and research agencies

1.5 The Nature of the Project and Facility

The terms *project* and *facility* are used throughout this practice guide, and while they appear to have the same meaning, they are actually distinctively different.

- *Project* describes the process of planning, designing, documenting for procurement and construction, procuring, contracting, and constructing a facility for delivery to its owner. The goal of a project is the facility, and this practice guide is largely

about the process of that delivery. The term *project* can refer to the object of the delivery process or the delivery process itself. The design and construction (delivery process) of a project is a unique combination of a scope of work (extent), its budget (cost), and its schedule (time).

- *Facility* is the completed project as a constructed entity intended for a specific purpose and function.

Philosophically, the process to deliver a facility is the confluence of an owner that wants a new facility with those that provide the aesthetic and technical design and those that construct that design. An owner wants something, it is designed, and then it is constructed. Around this simple conceptual idea is a large number of individuals, professionals, firms, companies, and agencies that work toward that goal.