APPENDIX 9

Union Internationale des Architectes · International Union of Architects

Professional Practice Information Notes

Note 2: Building Codes and Standards

This document has been prepared by the Professional Practice Commission of the International Union of Architects for the use and reference of UIA member sections in enhancing the practice of architecture.

It is intended to serve as an informational supplement to the policy issue, "Practice of Architecture", found in the UIA Accord on Recommended International Standards of Professionalism in Architectural Practice.

This Professional Practice Information Note was prepared by a Commission Drafting Panel chaired by David Harris, FAIA of the United States of America.

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Professional Practice Information Note on Building Codes and Standards

Definition

Building Codes and Standards and generally accepted practices largely define the acceptable standards of behavior, practice and technique for the construction of buildings and the production, properties and performance of buildings' materials, components and systems.

Background

Model building codes and voluntary standards are developed throughout the world, often by groups or committees representing, manufacturers, government agencies, contractors and other building community sectors. Upon adoption by governmental authorities having jurisdiction, these model codes and voluntary standards become or are incorporated in laws and regulations. The architectural profession possesses special knowledge that should be applied to the formulation of Building Codes and Standards.

Recommendation

The UIA urges its Member Sections to encourage and facilitate their members to be involved in the formulation and the drafting of national and international building codes and voluntary standards and to keep their members better informed about their content and importance.

Introduction

The content of and the interrelationships among building codes, standards, and other criteria utilized by architects are critical to the design, construction and safe use of buildings and other structures. They are essential tools that help architects and other building industry professionals provide the levels of performance sought by building owners and the public.

Building codes are generally defined as a collection of laws enacted by a government authority that pertain to the health, safety and general welfare of the public. Standards are generally defined as an agreed upon way of defining or measuring the performance or prescriptive characteristics of a product, design, or process.

UIA member sections can make important contributions to the establishment, use, monitoring and revision of these important criteria through which health and safety and other performance needs are measured. In order to assure continued avenues for long-term UIA input to these types of criteria, it is desirable that the UIA as an international organization become actively engaged in their development and maintenance at the international level.

Finally, architects in the forefront of developing model codes, standards, specifications, and construction documents have a professional obligation to convey the content and importance of these criteria to the students in the architectural schools in their respective countries.

1. Building Codes

Building Codes, for the purpose of this *Information Note*, include two primary types of documents:

- A "Building Code" is established by a governmental authority having jurisdiction (AHJ). It is a collection of laws that prescribe specific mandatory requirements for the construction of buildings and other defined structures that cover public health, safety and general welfare issues. The purpose of building code provisions is to provide a minimum level of protection, safety or other performance needs for the building's occupants and the public. In addition, land-use and zoning codes are typically adopted by jurisdictions to manage density and to help to ensure compatibility of uses.

- A "Model Building Code" is a document or set of documents produced by an organization through a public process to serve as a comprehensive set of model documents (e.g. model building code, model fire code, model plumbing code, model energy code, etc.) that are available for voluntary adoption by a governmental authority having jurisdiction, such as a municipality or a state. Upon such an adoption, the "Model Building Code" becomes the adopting governmental authority's "Building Code."

In recent years, the desire to employ "performance codes" to allow greater design flexibility and to afford greater latitude in meeting the intent of the code has increased. In those countries where a performance-based code has been adopted or is under consideration, there is an absolute need to concurrently develop agreed upon performance measures to effectively use this type of building code.

What are the desirability and advantage of having uniform national building codes?

In most countries, variations in geography, geology, and climate necessitate that the code provisions address the attendant performance needs associated with hazards stemming from these differences. By dealing with these variations at the national level, it has been shown that a nationally applicable code is better able to serve the full range of the entire nation's needs. The focus and effort of affected and knowledgeable interests attendant to the development of a nationally applicable model building code helps to ensure consistency and fairness in determining, addressing and meeting the diverse and common needs of all the nation's jurisdictions and more efficiently utilizes the country's technical expertise to most effectively serve the entire nation.

In most countries, the most concentrated governmental leadership is provided at the federal or national level. Under national forms of government, regional and local levels of government often have the responsibility to regulate construction in order to provide for the public health, safety and general welfare. As a result, it is the AHJs that adopt a Building Code, which is often based on a model code. In many countries, the development and maintenance of Model Building Codes have evolved as a cooperative public-private sector initiative that serves the needs of government, design professionals and all industry sectors.

Why should architects get involved?

Inasmuch as building codes greatly affect architects' services to their clients and their responsibilities as professionals, it is important that architects be involved in the code development process–whether for a model building code or a building code–in the countries in which they practice.

Fundamentally, building codes are an expression of acceptable means and technology to meet prescribed needs at a point in time. Over time, alternative means and advanced technologies must be considered or the building code can needlessly constrain technological advances and stifle other, more suitable alternatives and practices. By incorporating architects' knowledge and experience in the code development process, code interpretation and enforcement practices of a jurisdiction can be significantly improved. It is through an open code development processes that new technologies are fairly evaluated, recognized, and more rapidly utilized. Equally important, by involvement in the model building code development process and the code adoption process, architects have the ability to ensure that building codes do not impose inappropriate responsibilities on architects.

UIA and its members sections at the national level are well positioned to educate their members about the building codes affecting the practice of architecture in their countries and in other countries. The UIA's member sections can help architects worldwide to improve their access to information about building codes (and referenced standards), encourage participation in the

available code development process and thereby improve their services to their clients and the public.

How can UIA member sections best deal on an ongoing basis with building codes?

Architects can be involved in the model building code development process as individuals or through their professional association at the national, state and component levels. While most architects have limited time and resources with which to travel to and participate in frequent code committee meetings and hearings, electronic communication technologies enable participation without as much need to travel. Thus, architects are now better able and positioned to actively participate in model building code development processes than in the past. In countries with model building code development processes allowing open participation by architects and other building community professionals, the resulting codes are likely to be of far greater benefit to society. The importance of architects' involvement in the building code development and adoption process applies whether it is a model building code or a building code process operated by the government.

2. STANDARDS

Standards are agreed upon ways of defining or measuring the performance or prescriptive characteristics of a product, design, or process. Standards and the processes through which they are developed are essential components of domestic and international trade, in that standards are one of the most effective means of technology transfer; thus, international standards provide a world-wide technology transfer mechanism.

The interrelationships among building codes and standards are very important to the effectiveness of architectural services. For example, many standards are adopted by reference (i.e. specifically named by title, edition and part) in building codes, other standards, specifications and other technical criteria. Thus, standards have been called the "lynch-pin" of the regulatory, procurement, manufacturing and design functions of the building process. Seemingly subtle issues such as imperative vs. permissive language format of the standards can have a marked effect on the enforcement of the construction contract, as well as the building code.

When a standard, such as a test standard or a prescriptive material or product standard, is adopted by reference in a building code or contract specification, the applicable provisions of that standard require the same degree of compliance as do the building code or the contract specifications themselves.

It is desirable that standards be developed through voluntary consensus processes. This ensures that all knowledgeable and affected interests have an opportunity to participate. The key benefits this provides includes allowing all interests to offer their knowledge and experience to the process and provides the

checks and balances that help ensure that no one sector can dominate and unduly affect the content of the standard.

Some standards writing organizations use standard formats that enable users to better understand and find information therein. An important feature of many standards development processes is that they include procedures through which standards are produced to ensure fairness, openness and due process. Participation can be by personally attending meetings, electronic communication and teleconferencing. By actively participating, architects and other professionals have the opportunity to influence the standards and ensure they address the issues and needs of all users, including the public.

Of course the specific organizations with which architects from UIA member sections need to interact varies with the standards used in the building process, the standards setting practices, and standards setting organizational structures in each country. In some countries there may be several hundred standards development organizations (SDOs) just for the standards used in the building process, in others there may be one or only a few, sometimes governmental agencies. However, many SDOs address topics in which few architects have interest or responsibility. For the many standards that relate to the responsibilities of architecture, a sufficient number of technically knowledgeable architects, often with the support of their professional association and the architectural firms for which they work, are involved in the development and maintenance of standards to ensure they meet the needs of architects, building owners, and the public.

To architects, the term “standards” usually means standards related to the performance of building materials, products, and systems. However, other types of standards that have a major impact on the practice of architecture include several types of “production” standards. For example, standards are being developed that ensure that data used in computer software programs for CADD, cost estimating, specification writing, code checking, scheduling, and the like are able to be accessed and effectively used in related, but functionally different software. This concept, known as “interoperability,” fosters the use of a data and software structure based on a model structure known as industry foundation classes (IFC). The International Alliance for Interoperability, an international body with eleven chapters world-wide, has developed this IFC model. The IFC model has been adopted as a new standard, ISO/PAS 16739, which fosters the seamless transfer of data among all building process software programs. This new concept fosters the world-wide use of an “open” standard as the basis for data structures and software. additional information about IAI is included in the Appendix.

Other such standards set performance levels for building process/product functions such as cost estimating, project scheduling, the organization of project manuals, and facility maintenance and operations protocols. Standards that set format and content levels for production functions like CADD drawings (layering guidelines) and specifications writing (guide specifications). Other forms of process and document standardization include such functions as the agreement between the owner and the contractor, and the general conditions, addenda, and amendments to the contract for construction.

Some architects' professional associations publish specialized forms of agreement and other standard parts of the contract documents. These documents, which are prevalently used in the many countries, include forms of agreement between: 1) the owner and the architect, 2) the owner and the contractor, 3) the architect and consultants, and 4) construction administration forms. Examples and amplifying information about these and related standards are appended.

Even though many, if not most countries utilize standards that are developed in their country and primarily intended for use in their country, international standards development has, in recent years, been conducted at a more rapid pace. The avenue for the development of international standards is through the International Standardization Organization (ISO). The process through which ISO standards are developed is through committees, such as ISO TC 92 for fire standards. Committees exist also for building products and other performance requirements such as acoustical, environmental and structural. Participation by individuals is via the Technical Advisory Group (TAG) in each member country. These standards are of particular interest to countries actively involved in international commerce.

What are the desirability and advantage of having uniform national and international standards?

One of an architect's best protections from the liability associated with the practice of architecture is to follow the "prevalent standard of care." One aspect of this legal principal is to produce designs for clients that employ recognized standards that help to ensure the buildings being designed will perform as the client desires and be safe for use by the public.

How can UIA member sections be organized to deal on an ongoing basis with standards?

Architects can be involved as individuals or through their professional associations at the national, state and component levels. While most architects have limited time and resources to travel to and participate in frequent standards committee meetings, with today's electronic communication avenues, architects are better than ever positioned to actively participate in standards writing programs.

With the increased emphasis on international commerce in today's shrinking global environment, the UIA and its members sections at the national level are well positioned to educate their members about the standards, procedures and other nuances of practicing architecture in other countries. The UIA can, through its practice Commissions and member sections, help architects worldwide to improve their access to technical information, production aids, and the available support systems, thereby improving their service to their clients and society.

Appendix A – Building Codes and Standards Resources

This appendix is intended to serve as an information resource for UIA member sections. They are encouraged to submit citations to existing building codes and standards resources in their respective country and/or region to the Professional Practice Commission.

Africa:

Asia:

Japan: http://www.bcj.or.jp/src/sougou-e.htm

Australia:

Building Code of Australia (BCA) – The principles of the BCA are:

1. to safeguard people from possible injury, illness, or loss of amenity in the course of the use of any building, including the reasonable expectations of any person who is authorized by law to enter the building for the purpose of activities related to an emergency, such as rescue operations and fire fighting;
2. To facilitate access and circulation by all people by requiring reasonable provision for such access and circulation in the design of a building, having regard to its use and location; and
3. To protect adjoining buildings from structural damage, or damage as the result of a fire in the building.

For more information, go to:

Australian Building Codes Board: www.abcb.gov.au/content/codes/
Australian Institute of Building: www.aib.org.au/

Standards:

For information go to: www.standards.com.au.

Europe (European Union):

The European Union, comprised of some 15 member countries, operates through the programs of the European Commission (EC). The EC has issued the Construction Products Directive. In support of the Construction Products Directive, the Commission has issued

mandates to the Committee on European Normalization (CEN) to develop the appropriate performance and product standards (European Norms, i.e., ENs) to effect compliance with this Directive. lSO standards (see the Standards Section herein) have served in several cases as the basic references for these CEN standards.

European Union: Euro Codes:
http://europa.eu.int/comm/enterprise/construction/internal/essreq/eurocodes/eurohome.htm

France: www.tenlinks.com/engineering/civil/standards/international/france.htm
www.afnor.fr/portail.asp

Germany: www.tenlinks.com/engineering/civil/standards/international/germany.htm

United Kingdom: www.tenlinks.com/engineering/civil/standards/international/uk.htm

North America:

United States:

The International Code Council (ICC), located in the U.S., publishes the *International Family of Building Codes*. The ICC was formed by the merger of three U.S. regional model code organizations. For information about the ICC and its publications, go to: http://www.iccsafe.org. The ICC produces the following model building codes:

International Building Code
International Fire Code
International Mechanical Code
International Zoning Code
International Residential Code
ICC Electrical Code
International Existing Building Code
International Energy Conservation Code
International Fuel Gas Code
International Plumbing Code
International Private Sewage Disposal Code
International Property Maintenance Code
International Performance Code
International Urban-Wildland Interface Code

The ICC's model codes are maintained through an established code-change process that affords all sectors an opportunity to submit code change proposals and to participate in its committee-based process to change and update its codes. The ICC, through its offices throughout the United States and in Latin America provides the following products and services:

Code application assistance
Certification programs
Plan reviews
Monthly magazines and newsletters
Educational programs
Technical handbooks and workbooks
Automated products
Publication of proposed code changes

Training and Informational videos Evaluation services

NFPA 5000: Building Construction and Safety Code, 2003 Edition, published by the National Fire Protection Association (NFPA), located in the U.S.

The NFPA represents its new model code to be organized by occupancy, to combine regulations controlling design, construction, quality of materials, use and occupancy, location, and maintenance of buildings and structures. For information about NFPA publications, go to: www.nfpa.org.

U.S. Standards Coordinating/Writing Organizations:

American National Standards Institute: www.ansi.org/
ASTM: www.astm.org/

Production-Related Standards:

CADD Standards: The *U.S. National CAD Standard* (NCS) includes The American Institute of Architects' CAD Layer Guidelines, the Construction Specifications Institute's Uniform Drawing System, Plotting Guidelines developed by the U. S. Government, and other useful information. For more information about the NCS, go to www.nationalcadstandard.org.

Masterformat®, a structured format that organizes specification information into divisions and sections that relate to the trades and construction specialties that traditionally install them. Masterformat® is widely recognized and used in North America. For information about Masterformat®, see the website of the Construction Specifications Institute at www.csinet.org.

MASTERSPEC®, a privately developed commercially available guide specification system, is available from the American Institute of Architects. For information about MASTERSPEC®, go to www.arcomnet.com/visitor/masterspec/ms.html.

For more information about construction contract-related documents published by the American Institute of Architects, go to: http://www.aia.org/documents/home.asp.

For a guide specification to be an effective tool, it must reflect the traditional local business of constructing buildings. To serve as an effective and comprehensive tool, the broad array of generic products, materials, systems and subsystems must be included in order to assure that the architects and engineers and other designers are not restricted from considering all reasonably available options. Also, when public funds are used to construct buildings, it often prevents the naming of specific brands in the specifications. Thus, guide specifications should include a "generic" option as well as a "brand specific" one.

South America:

International Sources:

International Alliance for Interoperability (IAI) Formed in 1994, IAI promotes the development and use of international standards for the exchange of data among computer software platforms and applications (CADD, cost estimating, permitting, scheduling, O&M, etc.), to improve architecture, engineering, construction, facility management and related activities. The IAI councils are membership-based organizations representing AEC firms, software developers/vendors, product manufacturers, associations and government agencies. IAI chapters are active in North American, Europe, Asia, and Australia.

Organizations such as IAI have the ability to support automated access to and enhanced use of documents such as codes, standards and specifications. Membership and participation in such organizations can be extremely useful to UIA member organizations in effectively addressing local, national and international issues affecting their day-to-day professional activities. Go to: www.iai-international.org.

The International Construction Information Society (ICIS) is an association of organizations which provide national master specification systems and cost information systems. Members of the Society benefit from the direct exchange of information and ideas at the Society annual assembly and working group meetings. ICIS members are neutral and technically authoritative. ICIS consists of approximately 17 member organizations in 14 countries from four continents. ICIS' Internet site at www.icis.org, provides access to technical papers and links to related web sites.

For more information about construction contract-related documents published by the American Institute of Architects, go to: http://www.aia.org/documents/home.asp.

For more information about construction contract-related documents published by the Engineers Joint Contract Documents Committee (EJCDC), an initiative of several U. S. engineering associations, go to:https://ascestore.aip.org.