ICC REFERENCED STANDARDS GUIDE

Developed by the ICC Industry Advisory Committee (IAC)

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PREFACE

There is a long-standing relationship between construction codes and standards that address design, installation, testing and materials related to building construction. Building regulation cannot be effectively carried out without such standards. The critical role of standards in the building regulatory process is such that the standards are an extension of the code requirements and are therefore equally enforceable. Consequently, standards that are referenced in codes carry an expectation of being as clear, direct and enforceable as code requirements that are primary text. In recognition of this need, the International Code Council has included in Council Policy #28 Code Development (CP #28) criteria that standards must meet in order to be referenced in the *International Codes*.

The purpose of this document is to provide information that will aid in the understanding of the referenced standards criteria and provide guidance to standards developers and other users of the *International Codes* on the application and implementation of policy. This guide consists of five sections, the first of which is an introduction that summarizes briefly the role of standards in codes. Following the introduction are three distinct parts. Part I consists of a description of the referenced standards criteria and discussion of their purpose. Part II contains examples of how two prominent provisions of the policy apply, the requirements that standards be written using mandatory language and developed through a consensus process. Part III provides answers to frequently asked questions related to the purpose, use and implementation of the referenced standards criteria. The final section is an appendix of related background information.

Suggestions and comments on this document are welcome and should be directed to: International Code Council, Codes & Standards Development, Chicago District Office, 4051 West Flossmoor Road, Country Club Hills, IL 60478 (Phone: 888-ICC-SAFE).

INTRODUCTION

Standards in Codes

Standards and their relationship to the code

A standard is a published technical document that represents an industry consensus on how a material, product or assembly is to be designed, manufactured, tested or installed so that a specific level of performance is obtained. Standards are primarily developed by industry organizations and professional associations incorporating the views of interested parties. A standard is developed in response to an identified need and typically contains information which is based on experience, knowledge, testing, analyses and research.

A standard is not intended to be used as primary law but as a referenced authoritative resource. While a model code becomes law when it is adopted by a jurisdiction, a standard becomes law to the extent to which it is referenced in a model code. When a standard that is referenced in the code (first-tier reference) in turn references another standard (second-tier reference), the second-tier referenced standard is equally applicable, again, to the prescribed extent of the reference to it in the first-tier reference. This trail of applicability extends throughout all tiers of references.

A model code establishes minimum quality and performance criteria for the materials and methods regulated by the code. For many materials and methods the code relies on referenced standards to provide these criteria. The referenced standards are an enforceable extension of the code. Standards supplement the code by setting forth conditions or requirements that a material or method must meet, thereby providing an acceptable level of safety for building occupants. To comply with the provisions of the model code, a method or material must meet the requirements of the referenced standard.

When the code has specific requirements that vary from those found in a referenced standard, the requirements of the code take precedence over the standard. If the code is silent on a particular issue, then the provisions in the standard are applicable to the prescribed extent of the reference to that standard.

An example of how standards are referenced in codes is as follows. This text is taken from the 2006 *International Mechanical* Code. Note that this provision references six different standards within one section. The prescribed use of the standard is specifically limited to testing.

> ***923.1 Forced-air furnaces.*** *Oil-fired furnaces shall be tested in accordance with UL 727. Electric furnaces shall be tested in accordance with UL 1995. Solid fuel furnaces shall be tested in accordance with UL 391. Forced-air furnaces shall be installed in accordance with the listings and the manufacturer's installation instructions.*

Purpose of standards

The purpose of standards is to provide a common reference that facilitates the flow of goods and services between buyers and sellers. By specifying that construction methods or materials must meet or exceed a given standard, users can take advantage of years of technical research that went into the development of the standard without requiring that they have the technical expertise necessary to fully understand the standard.

Types of standards

Standards address construction materials, design and engineering requirements, installation methods, or testing practices. A brief description of these types of standards is given along with an example of each type of standard, the *International Code* and code section in which it is referenced.

Standard Type	Description	Standard	Code[1] & Section No.
Materials	Address product quality characteristics such as composition, dimensions and		

Purpose of Section 3.6

Together with standards, codes establish a mechanism for effective regulation of building construction. When codes are adopted by units of government (i.e., cities, counties, states, or other agencies or jurisdictions with regulatory authority), they provide the legal framework for the regulation of public health, safety and welfare in construction. A code sets forth the provisions for administration and enforcement; it also addresses the multiplicity of authoritative resources on a subject, some of which are standards.

What a code cannot readily do, however, is address in detail every specialty area of construction methods and materials. In order for a code to accomplish this it would, out of necessity, run thousands of pages in length and be unwieldy. Instead, codes rely on references to consensus standards to provide clear and detailed enforceable rules for specialty areas within the construction process. As an example, Chapter 15 of the 2006 *International Mechanical Code* is only 6 pages long, but it lists by number and title more than175 standards issued by 18 different organizations. The cumulative text of these documents would outweigh the code itself many times over.

Standards are vital to the model code system, but their role must be clearly understood. Standards are typically not intended for adoption as primary law; rather they are only intended to set forth expert, detailed procedures for the design, manufacture or installation of a specialized material or method. A standard addresses aspects of a specific construction activity, whereas a code addresses the "big picture." One should not be confused by some standards which use the word "code" in their titles. The scope quickly reveals that such documents are not codes but, in fact, standards.

Recognizing the integral part that referenced standards play in the *International Codes*, the ICC Board of Directors incorporated criteria for referenced standards into CP #28 Code Development. The policy ensures that all standards adopted into the codes are: suitable for the purpose for which they are referenced; technically accurate; and developed according to a consensus process that provides the opportunity for interested parties to have their views considered. It also promotes the overall quality of the *International Codes* and heightens their enforceability in situations where standard's provisions are applicable. As noted on page 6, this policy is comprised of 15 criteria which focus on a standard's application, content and promulgation method.

Given the growing understanding and resulting cooperation with the ICC by the standards promulgators, each new referenced standard proposed for inclusion in the *[illegible]*

PART II

Application of Section 3.6

Though all 15 of the criteria which make up Section 3.6 of the CP #28 are equally important, the principle issues which have been discussed the most are the requirement that standards be written in mandatory language (Section 3.6.2.1) and the requirement that standards be developed through a consensus process (Section 3.6.3.2).

The following information and examples focus on the application of these two criteria.

Mandatory language

Provision: **3.6.2 Standard Content:**
3.6.2.1 A standard or portions of a standard intended to be enforced shall be written in mandatory language.

Application: The need for mandatory language in referenced standards should be obvious in this context because a standard is intended to be utilized for regulatory purposes. As a result, the standard must be presented so that the application and intent is clear to all readers. The use of recommendations, advisory comments, and permissive, non-mandatory terms fails to provide sufficient specific direction to all users. A potential result is non-uniform interpretation or misapplication of the provisions. In particular terms such as "may," "should" and "can" are particularly significant in disrupting consistency of use as they create undefined conditional statements and can confuse the application of regulations.

This is not intended to mean that informational or explanatory materials cannot be developed to aid the reader in the use of the referenced standard. However, such material must be limited to a location within the document that is clearly identified as not being a mandatory part of the standard.

The existence of terms that by themselves are considered non-mandatory, particularly the word "may", must be considered in the context of its use. In some cases, a statement that includes the term "may" would not be judged to be a strict violation of the ICC policy, however, the use of "may" is at best unnecessary. In virtually every case, the intent of the standard can be accomplished without using "may" and the result is usually a clearer and more precise standard.

The following are typical examples of non-mandatory language. These examples are hypothetical and are intended only to illustrate the effect of non-mandatory language. The specific text is not intended to portray actual, technical content.

Example 1: Providing for an option but failing to require compliance when the option is chosen.

Text: A section within a standard addresses the connection of the bond wire between a loading pipe and a cargo vehicle. It states:

The fixed end of a bond wire shall be connected to a fill pipe. In lieu of connecting the fixed end of the bond wire to a fill pipe, the bond wire may be connected to a metal loading rack that is electrically connected to the pipe.

Comment: The intent appears to be clear. If the bond wire is not attached to the fill pipe, it must be attached to a metal loading rack. However, the text literally does not mandate that the bond wire be connected to the loading rack when connection to the fill pipe is not used. With the use of the term "may," the section only states that there is another location to which the bond wire might be connected but it does not require the bond wire to be connected to that location nor does it preclude some other unspecified and potentially unacceptable alternative location

Solution: The proper solution in this case depends on the intent of the standard. If the intent is that connecting the bond wire to the fill pipe or the loading rack are the only two acceptable connecting locations, then simply changing "may" to "shall" in the second sentence is appropriate. This will provide for the option without any ambiguity. The vagueness and potential for misapplication regarding any other methods of connection is eliminated.

*...In lieu of connecting the fixed end of the bond wire to a fill pipe, the bond wire **shall** be connected to a metal loading rack that is electrically connected to the pipe.*

If the intent of the standard is to allow additional options that accomplish the intended result, there is additional text needed. It is inappropriate to presume that the original text above can be interpreted, or is necessary, to allow for other equivalencies. This can be accomplished by general text overlaying the entire standard that pr

more clear and precise.

Solution: *Ingredients for each adhesive mix shall be determined by weight,* ***except that liquids shall be measured by weight or volume****.*

Example 5: A statement that allows something does not prohibit anything else.

Text: A standard establishes limitations on construction materials in enclosure walls. It states:

Where the walls of an enclosure are required to have a fire resistance rating they shall be constructed of solid masonry units. Non-fire resistance rated enclosure walls may be constructed of hollow masonry units.

Comment: This is similar to example 2 in that the second sentence allows the use of one type of material but literally does not restrict the use of other materials. For example, there is nothing that prohibits the use of combustible materials in non-fire resistance rated walls. The text was probably written with the mistaken presumption that the second sentence

Example 7: Unenforceable provision resulting from the use of subjective text and non-mandatory language to provide for an option.

Text: A standard addresses the condition of the gas supply during installations and modifications. It states:

All gas piping installations, equipment installations and modifications to existing systems shall normally be performed with the gas turned off to eliminate hazards from leakage of gas, except as outlined in "b" below.

a. Reduce gas pressure and purge section to be worked on as specified in 4.3.

b. Hot taps may be made if they are installed by trained and experienced crews utilizing equipment specifically designed for such a purpose.

Comment: The apparent intent of the standard is that paragraph b establishes the only condition under which the gas supply can be left on. The term "normally" in the main paragraph may have been included on the mistaken view that it was necessary in order to clarify that an exception exists. However, the word "normally" only serves to introduce a lack of clarity. It begs the question of what is and is not considered "normal". It is not readily apparent that the "normal" condition is everything other than that described in the exception. Additionally, the use of "may" in paragraph b creates the same enforceability deficiency described in previous examples.

Solution: An exception to allow the gas supply to remain on under certain conditions can be accomplished without making the provision unnecessarily vague and subjective. Eliminating "may" makes the intent and application of the exception more precise and clear.

*All gas piping installations, equipment installations and modifications to existing systems **shall be performed** with the gas turned off to eliminate hazards from leakage of gas, except as outlined in "b" below.*

a. Reduce gas pressure and purge section to be worked on as specified in 4.3.

*b. **Gas is not required to be turned off** where piping and equipment is installed by trained and experienced crews utilizing equipment specifically designed for such a purpose.*

Another acceptable solution to the wording of paragraph b would be:

*b. Hot taps **shall not be prohibited** if they are installed by trained and experienced crews utilizing equipment specifically designed for such a purpose.*

Example 8: Alternatives provided without conditions or limitations; reference to Appendix material with no indication of use or application.

Text: A standard establishes how to determine gas pipe size. It states:

The volume of gas to be provided shall be determined from the input ratings of the gas utilization equipment served. The aggregate connected hourly load shall be used for pipe sizing since all equipment may be operating simultaneously. If a diversity of load can be established, smaller pipe sizes may be used. Where equipment ratings are not known, Table C-1 of Appendix C shows the approximate demand of typical appliances by type.

Comment: The term "may" in the second sentence is not a strict violation of the mandatory language policy. Although the phrase "since all equipment may be operating simultaneously" could be considered by some to be essential for understanding and applying the next sentence on alternative pipe sizing, that text is actually commentary and would be more appropriately relocated to a commentary, annex or non-mandatory note.

The term "may" in the third sentence is another example of an unnecessary use of non-

Consensus Promulgation Process

Provision: **Criterion 3.6.3 Standard Promulgation:**
3.6.3.2 The standard shall be developed and maintained through a consensus process such as ASTM or ANSI. Standards developed using the ANSI Canvass Method shall comply with the Report of ICC Modifications to the ANSI General Procedures and to ANSI Annex B – Procedures for Canvass by an Accredited Sponsor.

Application: The use of a consensus process is vital to ensuring that a standard truly represents the state of the art. A consensus process has many attributes, not the least of which is a formal process of considering all viewpoints, with regular updating and information availability. These and other features are particularly significant in dealing with regulatory documents.

The key elements of any consensus process are provisions for an open process, timely notification, resolution of concerns, published procedures, an appeals process, the balancing of interests, maintenance of records and periodic review of existing standards. (See the Comparative Criteria for Consensus Standards in the Appendix)

Example: Three manufacturer's of solid gold widgets get together and write an installation manual titled *Installation of Widgets*. No other parties were asked to participate in the development of the installation manual. It was developed over a two week period of time in 1968. It has not been revised.

The current edition of the code requires that "*Widgets shall be installed in accordance with the manufacturer's installation instructions*."

One of the three solid gold widget manufacturer's submits a code change proposal to revise the code to read "Widgets shall be installed in accordance with the *Installation of Widgets - 1968 edition* ~~manufacturer's installation instructions~~."

Comment: A review of the promulgation process used to develop the proposed document quickly demonstrates that the process cannot be deeml

PART III

Frequently Asked Questions

Which referenced documents are subject to compliance with Section 3.6?

All proposed new documents to be referenced in an *International Code*, with the exception of other *International Codes*, are subject to compliance with Section 3.6 of CP #28. Some currently referenced documents may not be considered "standards" in the strictest sense because of their scope and content, but they are still subject to compliance with Section 3.6. Some documents that are in reality standards, use "Code" in their title. Within the family of International Codes, all referenced documents - with the exception references to other *International Codes*, regardless of their titles, are considered "standards".

How is a new standard added to an International Code?

A new standard (i.e. a standard that is not currently referenced in the Code) is incorporated through the submission of a proposed change in accordance with Section 3.0 of CP #28. In this respect, the inclusion of new standard is subject to the full code development process in the same manner as any other proposed revision to the Code. In other words, the proposed reference must be identified on the code change submittal. ICC has standardized the submittal process through the use of a form called “Public Code Change Proposal Form”. This form is periodically updated. The current form can be downloaded from the ICC website at:

www.iccsafe.org/cs/codes/publicforms.html

The proposed change must include the precise text addition or revision that is being proposed. If the standard is proposed for reference in more than one section of the code, the precise text for each such provision must be included. The exact number, title and edition year of the proposed standard must also be identified in the supporting statement for the proposal.

It is not necessary to include in the proposed change the addition of the standard into the last chapter of the Code (Referenced Standards). The content of the referenced standards chapter is established editorially based on the standards

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forwarded to the proponent and the appropriate code development committee and are published with the proposed change as part of the Analysis of the proposal.

What is the significance of an "Analysis" to a code change which proposes to reference a new standard in an International Code?

The "Analysis" statement is used as a means to provide information to the participants in the process that is relevant to the consideration of the proposed change. An Analysis statement, when provided, will address one or more of the following points.

-History of the code section being affected by the proposed code change.
-Aspects in which the proposed code change will improve the code.
-Conflicts the proposed code change might create.
-Deficiencies in the supporting statement.
-Whether supporting documentation has been provided.
-Whether or not a proposed new standard, in the opinion of the Secretariat, complies with Section 3.6 of CP #28. If the standard does not comply with Section 3.6, the specific aspects of noncompliance are identified.

Example Analysis Statement:

*The standard being proposed is ACME X21.1-2005. A review of ACME X21.1 has demonstrated that the document does not comply with Sections 3.6.2.1 and 3.6.3.2 o*f CP #28 *as it has not been demonstrated to have been developed through a consensus process and contai*

What is the status of a proposed change in which a standard is reported as not complying with the policy but is recommended for approval at the public hearing either by the code development committee or an assembly action?

Proposed code changes which reference new documents in an *International Code* are treated in the same manner as a proposed code change which adds new code text. The Secretariat's analysis provides information that can be taken into consideration by

are not mandatory parts of the standard they too are subject to compliance with Section 3.6. The objective is to enable all users of the standard to readily identify the applicable provisions that determine compliance with the standard.

To address this issue, some standards writing organizations include caveat statements within their standards which state how "informational" statements and non-mandatory portions are intended to be used.

Example for "Notes":

> *The text of this standard references notes, footnotes, and appendices which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the specification.*

Example for "Appendices":

> *This Appendix is not a part of the requirements of this standard. It is included for information purposes only."*

Does every use of the term "may" in a standard constitute a violation of the ICC Policy?

No. The mere existence of the term "may" in a standard does not automatically mean that it does not comply with Section 3.6. The effect of a statement that uses "may" must be looked at in context.

The term "may" typically has two functions. Black's Law Dictionary (Sixth Edition) Policy?

in violation of the ICC Policy, will produce a better standard. The unnecessary use of ambiguous terminology makes the standard less precise and subject to misinterpretation or misapplication.

Hypothetically, one could interpret that the use of the term "may" means the same as "may or may not." If this interpretation was somehow favorable to one side of a dispute (such as a restraint of trade of product liability claim), the result could be refusal to recognize the validity of other options that are intended to be acceptable. One might argue that this is an unlikely scenario since most people are reasonable and prudent. However, in this increasingly litigious era, there is no need to run the risk of exposure to a foreseeable misapplication of the intent of a standard no matter how remote it may seem today.

By stating requirements in clear and concise language the potential for misapplication is significantly reduced. The unnecessary use of non-mandatory terms can be easily avoided without compromising the versatility intended by the standards developer.

APPENDIX

As noted in this Guide, ICC uses extensive use of the ICC website for purposes of providing the most up-to-date information relative to the ICC Code Development process. The user of this Guide is encouraged to visit the following web pages to find documents cited in this Guide as well as other useful information.

CP #28 Code Development:
www.iccsafe.org/news/about/bylaws.html

Code change form – “Public Code Change Proposal Form”
Comment form – “ICC Codes – Public Comment Form”
www.iccsafe.org/cs/codes/publicforms.html

Powerpoint presentation of the ICC Code Development Process:
www.iccsafe.org/cs/codes

Code change history from previous ICC Cycles:
www.iccsafe.org/cs/codes

COMPARATIVE CRITERIA FOR CONSENSUS STANDARDS

This section provides guidance concerning the fundamental characteristics regarding two standards development processes. This material is meant only as a guide and therefore, the user of this Guide is responsible for complying with the applicable requirements as set forth by the organizations. As noted for ICC procedures, the procedures of both ASTM and ANSI are subject to change. For the latest procedures, be sure to visit:
ocedures, ASTMe to visit: