**ASHRAE**

**Writing Standards in Code-Intended Language**

**Version 2**

**January 12, 2015**

This document may not be distributed in whole or in part in either paper or electronic form outside of ASHRAE membership without the express permission of the ASHRAE Manager of Standards.

**1. INTRODUCTION**

ASHRAE Rules of the Board (ROB) includes these rules:

*1.201.004.5 All standards shall be written in definitive mandatory language.*

*1.201.004.3 Standards that are intended for code use should be concise and written in appropriate code language with simple and direct prescriptive methods for compliance, with alternative performance paths.*

*1.201.003.1 Write all new and revised standards and addenda that cover subjects addressed in building codes or regulations in such a way that those standards can be readily integrated into those codes and regulations and applied as an integral part of the resultant code or regulatory documents.*

The Procedures for ASHRAE Standards Actions (PASA) defines code-intended standard and a code language document as:

***code-intended standard:*** *A standard intended to be adopted as a code using code language.*

***code language document****: A document that presents a set of requirements related to the design, application, or use of HVAC&R and related technologies where all or portions of the document may be enacted as mandatory enforceable requirements by a political jurisdiction. Portions intended to be enforced (normative) are written in mandatory, enforceable language. Portions not intended to be enforced are identified as informative and are to be located in informative notes, in informative annexes (appendices) or in other advisory documents. See annex, informative annex, informative notes and normative annex.*

These rules and definitions support ASHRAE’s objective to have code-intended ASHRAE Standards adopted by reference directly into laws, rules, regulations, and other documents that cover the built environment, or referenced as a component of other standards, model codes and documents that form the basis for those same laws, rules, and regulations. To achieve this objective:

* ASHRAE standards must be written entirely in mandatory language.
* ASHRAE standards intended for adoption within codes, rules, regulations, and other documents that cover the built environment must be written in code-intended language.

A companion guide, *ASHRAE Guide to Writing Standards in Mandatory Language,* provides steps for all Project Committees (PCs) to complete as a step toward compliance with the ROB’s mandatory language requirement.

The nature of writing standards in code-intended language requires a basic understanding of how codes, rules, regulations and other documents must be written to clearly state specific requirements and desired outcomes that can be documented and verified for compliance within a legal framework. A code-intended standard must also align with other model codes and standards that are collectively used to regulate the built environment, and compliance with any path in the standard must be capable of being uniformly documented and verified.

**2. GUIDANCE FOR WRITING STANDARDS IN CODE-INTENDED LANGUAGE**

**2.1 Responsibilities**

**2.1.1 Standard Project Committees**

**2.1.1.1 Mandatory Language.** Each standard project committee (SPC) and standing standard project committee (SSPC) must review its draft standard or addendum to identify the use of non-mandatory language, following the steps in *ASHRAE Guide to Writing Standards in Mandatory Language* Section 2.2.1 before submitting the draft for publication public review approval. If the SPC/SSPC is unable to make corrective revisions to eliminate non-mandatory language the SPC/SSPC is encouraged to request assistance from ASHRAE staff to assist with the development of revisions to meet the mandatory language requirement.

**2.1.1.2 Code-Intended Language.** Each SPC/SSPC must review and apply the guidance in Section 2.2 of this guide before submitting its draft for publication public review approval. To facilitate the development of appropriate code-intended language and reduce the need for and time associated with outside assistance, PCs are encouraged to establish a format and compliance subcommittee, comprised of one or more volunteers, focused on meeting the code-intended requirement. If the SPC/SSPC is unable to make corrective revisions to comply with the code-intended language requirement, the SPC/SSPC is encouraged to request assistance from ASHRAE staff to assist with the development of revisions to meet the code-intended language requirement.

**2.1.2 Standards Project Liaison Subcommittee (SPLS).** SPLS, with support from ASHRAE Staff, (a) will review the normative portions of code-intended draft standards and addenda submitted for public review to determine if they are written in both mandatory and code-intended language, and (b) will assist the project committee (PC) Chair (or his/her designee such as a format and compliance subcommittee) with revisions that will result in the draft standard or addenda meeting the code-intended language requirements.

**2.2 Code-Intended Language Format and Content**

**2.2.1 General.** The criteria in Sections 2.2.2 through 2.2.6 must be followed by PCs writing code-intended standards and addenda. Informative Annex A provides examples of how to (and how not to) write standards in code-intended language and rationale behind the need for code-intended language.

**2.2.2 Conformity Assessment**. Reference to third-party testing, certification, listing, labeling or other entities engaged in documenting or verifying compliance with any part of the standard or addenda must be referred to as an “approved agency” instead of including the name of the third-party. The following definition must be included in each standard.

***approved agency****: an agency engaged in conducting tests, furnishing inspection services, or commissioning services that has been approved by the entity responsible for validating compliance with this standard.*

**2.2.3 Coordination and Integration with Other Relevant Documents.** Where the standard is intended to be used in conjunction with documents published by other standards or model code development organizations, the ASHRAE standard must be sensitive to “meshing” with those other documents so that the ASHRAE standard will be adoptable by reference into those documents to address the topic covered by the ASHRAE standard.

**2.2.4 Responsibility within Code-Intended Standards.** Where the standard requires something to be done, the standard needs to identify what is required to be done, who is required to do it, and, if relevant, who is required to receive the results. More specifically, where the standard requires something to be done, a specific criterion and a metric must be provided as the basis for documenting and verifying compliance.

**2.2.5 Simple and Repeatable.** The standard will be more adoptable by reference where the criteria are stated simply and, where there are multiple paths to compliance with the standard, each path must be similarly repeatable and comparable.

**2.2.6 Administration and Compliance.** The standard will be more adoptable by reference and applied where the criteria related to administering, documenting, and verifying compliance are combined and located into one section in the standard titled “Administration and Compliance.”

**2.2.7 Normative References**. The Project Committee Manual of Procedures (PC MOP) defines a normative reference as *“*a reference to a document that establishes a requirement necessary to comply with the referencing standard.” For all standards, normative references must be specifically referenced by publication date, approval date, or version number.

**2.2.8 Informative Information in Normative Sections**. The PASA defines the use and limits of informative information within normative sections of ASHRAE Standards as:

***informative notes:*** *explanatory information, appearing in a standard, that does not contain requirements or any information considered indispensable for the use of the standard. Informative notes are to begin with the words “(Informative Note(s))” and be placed after the section of the standard to which the note applies. If the informative note is more than two sentences, the information must be placed in an informative annex and referred to by the informative note. Where there is more than one informative note, the notes must be numbered sequentially.*

**INFORMATIVE ANNEX A**

**CODE-INTENDED STANDARDS: EXAMPLES AND RATIONAL**

**A1. Conformity Assessment**

Conformity assessment is the mechanism(s) by which documentation and verification that something required has been realized. For the purposes of this document, conformity assessment means “any activity to determine, directly or indirectly, that a process, product, or service meets relevant technical standards and fulfills relevant requirements.” Examples of conformity assessment activities include testing, surveillance, inspection, auditing, certification, registration, and accreditation.

For example, a test standard clearly establishes uniform provisions for conducting a test or other activity to verify an outcome. Some ASHRAE standards are themselves test standards, while other ASHRAE standards refer to test standards developed by ASHRAE or others.

As stated in Section 2.2.6, normative portions of ASHRAE standards need to reference standards or other documents with a specific publication or approval date included in the reference. Not doing this would amount to acceptance of future versions of the reference materials.

Examples from selected ASHRAE standards are provided below to highlight conformity assessment associated issues, why there are potential issues, and how to more appropriately present the information in the standard.

**A1.1 Approved Agency**

***Fenestration and Doors.*** *Air leakage for fenestration and doors shall be determined in accordance with NFRC 400. Air leakage shall be determined by a laboratory accredited by a nationally recognized accreditation organization, such as the National Fenestration Rating Council, and shall be labeled and certified by the manufacturer. Air leakage shall not exceed 1.0 cfm/ft2 for glazed swinging entrance doors and for revolving doors and 0.4 cfm/ft2 for all other products.*

As stated in Section 2.2.2, third-party testing, certification, listing, labeling or other entities engaged in documenting or verifying compliance with any part of the standard cannot be included in the standard by name but instead must be referred to as an “approved agency.” Federal, state, and local agencies that formulate and implement associated laws and regulations based on or through adoption of the ASHRAE standard by reference have the authority to determine what third-parties are and are not acceptable by name or by reference to a nationally recognized accreditation program. If not in a regulatory context, those that adopt and use the standard will determine who they consider suitable to conduct conformity assessment on their behalf.

Consider the suggested revision below of the existing standard provision shown above. As revised, the issue of naming a particular conformity assessment organization is removed. The reliance on the test standard is retained, and the decision as to who is an “approved agency” is left up to the entity adopting or requiring conformance with the standard. Note that a definition of approved agency is provided in Section 2.2.2 for inclusion in ASHRAE standards where the issue of conformity assessment arises.

***Fenestration and Doors.*** *The air leakage rate of glazed swinging entrance doors and revolving doors shall not exceed 1.0 cfm/ft2 and for all other products shall not exceed 0.4 cfm/ft2. The air leakage rate shall be determined by an approved agency in accordance with NFRC 400 and the product labeled.*

**A1.2 Testing and Certification**

***Fenestration and Doors.*** *Procedures for determining fenestration and door performance are described in Section X. Product samples used for determining fenestration performance shall be production line units or representative of units purchased by the consumer or contractor.*

The conformity assessment issue in the example above is what product samples, how many, where they are from, etc., is within the purview of the third-party testing or certification agency. It is not appropriate to provide these in the standard unless the PC feels the standard needs to have a specific section on conformity assessment. If so, then care must be taken to ensure that similar detail is provided for all other products and materials in the standard so that there is consistency on this issue where the standard has criteria applicable to multiple products.

**A1.3 Alternative Paths, Consistency, and Comparability**

***U-factor:*** *U-factors shall be determined in accordance with NFRC 100. U-factors for skylights shall be determined for a slope of 20 degrees above the horizontal.*

***Exceptions:***

1. *U-factors from Section X which applies to unlabeled skylights) shall be an acceptable alternative for determining compliance with the U-factor criteria for skylights. Where credit is being taken for a low-emissivity coating, the emissivity of the coating shall be determined in accordance with NFRC 300. Emissivity shall be verified and certified by the manufacturer.*

In the above example, the standard clearly states a reference test procedure for determining a thermal property of skylights and then provides an alternative source for skylights that are unlabeled. For consistency, the standard has identified a test standard that must then be referenced as the only acceptable conformity assessment condition. Where default values are to be used for untested products, there is a potentially inconsistent set of conditions: one being to test, but the other one indicating a test is not required. With respect to the low-emissivity coating in the above example, the manufacturer can self-test and certify emissivity data for their products as stated in the last sentence. This does not appear to be consistent with other sections of the standard where a more rigorous conformity assessment activity is required. In referencing test standards to guide performance of products, systems, materials, or other components in an ASHRAE standard, the provisions in the standard must be sensitive to consistency on conformity assessment related issues throughout the standard.

Another potential conformity assessment issue is referencing computer programs, websites, or other sources of information that are not fixed in time by a publication date, approval date, or version number as required in Section 2.2.6.

**A2. Meshing with Other Codes and Standards**

If an ASHRAE code-intended standard is coordinated with other codes and standards then the ASHRAE standard can mesh with those other documents, and collectively they address the same or a broader scope than the ASHRAE standard addresses. If the ASHRAE standard cannot mesh with other relevant documents, then it will either not be adopted by reference or will be adapted into those other documents so it can be used with them. In either case, the criteria in the ASHRAE standard may not be what is ultimately adopted and required to be satisfied. This would be less likely to occur with method of test standards, which in and of themselves, are generally designed to stand alone, or with standards associated with measurement data or expression of performance. In addressing this issue, consider if the standard can stand alone where applied or, like one piece in a jigsaw puzzle, it is likely to be part of, or related to, a broader set of requirements comprised of multiple documents. If the latter situation is envisioned, then the standard needs to be written so it can mesh with those other documents.

Consider the following examples from ASHRAE standards that highlight this issue. It is important to emphasize that the wording presented is certainly acceptable if the ASHRAE standard is the only code or standard applied to the subject. If not, then those other documents can conflict with the ASHRAE standard and preclude the ASHRAE standard being adopted by reference, cause it to be adapted or modified by another Standards Development Organization (SDO), or cause it to be adapted or modified by the entity adopting the ASHRAE standard.

**A2.1 Compatibility Regarding Building Types and Spaces**

***Commercial occupancy*** *is a premise or that portion of a premise where people transact business, receive personal service, or purchase food and other goods. Commercial occupancies include, among others, office and professional buildings, markets (but not large mercantile occupancies), and work or storage areas that do not qualify as industrial occupancies.*

***Large mercantile occupancy*** *is a premise or that portion of a premise where more than 100 persons congregate on levels above or below street level to purchase personal merchandise.*

The terms “commercial occupancy” and “large mercantile occupancy,” while usable within the context of a specific ASHRAE standard, are not correlated with other ASHRAE standards nor are they in line with the definition of building use groups as provided in other codes and standards. This adversely affects the ability of those other codes and standards to adopt the ASHRAE standard by reference to address the subject covered. Use of the language in the above example would not only prevent having the standard adopted by reference, but would also (a) necessitate the adaptation of parts of the ASHRAE standard within those other codes and standards, and (b) require some “guessing” on the part of those adapting the criteria in the ASHRAE standard as to how the criteria should be applied to the building types and spaces contained in their documents.

**A2.2 Compatibility Regarding Components of Buildings**

***building entrance:*** *any doorway, set of doors, turnstile, vestibule, or other form of portal that is ordinarily used to gain access to the building by its users and occupants.*

The terms “entrance” and “main entrance” have specific meanings in building and fire codes. If it is the intent of the ASHRAE standard using the above definition to address all building entrance doors without exception, the definition could be revised to be consistent with the terms used in building and fire codes. If the intent is to just address some entrances in a different way than currently addressed in building and fire codes (e.g., entrance, main entrance, or accessible entrance), then the standard could be revised to either refer to or use the definitions in those other documents. Moreover, if there is a specific need for a difference, then the PC can develop new terms and definitions to address the issues that are unique to entrances covered by the ASHRAE standard.

**A2.3 Compatibility Regarding Building Systems**

***Exception: Commercial kitchen hoods used for collecting and removing grease vapors and smoke.***

Other codes and standards addressing this subject use the terms Type I and Type II hoods to describe the effluent conducted by the hood. The example above from an ASHRAE standard can stand alone, but it is more likely that it would be applied with other codes and standards addressing this topic and additional topics associated with mechanical systems in buildings. In not being coordinated with other codes and standards, it will be difficult to claim the exception intended in the ASHRAE standard on a uniform basis. This issue could be addressed by changing the ASHRAE standard to exempt “Type I hoods” and then define Type I hoods in the definitions section of the ASHRAE standard.

**A2.4 Including Criteria Already in Other Standards**

***Feeders.*** *Feeder conductors shall be sized for a maximum voltage drop of 2% at design load.*

***Branch Circuits.*** *Branch circuit conductors shall be sized for a maximum voltage drop of 3% at design load.*

The provisions shown in above example regulate the size of electrical system components in buildings. While these provisions can be applied using the ASHRAE standard alone, the ASHRAE standard must also be applied to buildings with a myriad of other codes and standards. One of those other codes and standards already contains such a provision, and that standard is widely adopted to regulate electrical system safety and performance. Including this provision in an ASHRAE standard where it is already contained and maintained in another creates a situation where two standards have criteria on the same topic and could diverge at any time. A conflict with another code or standard that is clearly the authority on a subject can be avoided by simply referring to that other code or standard and the specific criteria therein.

**A2.5 Compatibility on Definitions of Terms**

 ***Exception: Lighting in spaces where patient care is rendered.***

The term “patient care” is not defined in the above example, but would be an appropriate definition in the ASHRAE standard. However, that definition must be correlated with other codes and standards governing health care, although those definitions could cast a very wide net allowing this exception to possibly be used where it is not necessarily intended by the standard. If it is determined in this case that the patient care definition intended by the standard is the same as that in other codes and standards, then the definition in the ASHRAE standard must be consistent with that definition. On the other hand, if not the same as that in other codes and standards, then the ASHRAE standard could define another term that would represent a subset of patient care to eliminate any potential conflict between the ASHRAE standard and the other related codes and standards.

**A3. Identification of Responsible Parties**

Identification of responsible parties is relevant to ensuring that if something is to be done that someone or some entity is named as having responsibility to do it, and if someone is to receive it, then that someone or entity is also named. This is an important issue because if something is required to be done but no responsible party is named, then there is no mechanism to ensure what is required by the standard actually takes place. Without specifying a responsible party, the standard leaves it to those adopting the ASHRAE standard to define the responsible party themselves. If something is to be done and someone is supposed to do it or be involved in its development or delivery, then the ASHRAE standard is the place to establish the applicable and governing criteria. In addition, in establishing those criteria it is important to focus on a particular skill set as opposed to using specific names, titles, job descriptions, etc.

A related item associated with compliance verification is simply if compliance with the stated provisions can be verified, at what time in the process and by whom. If the standard provides a requirement that is intended to be enforced at one point in time but there is no entity likely to be available to ensure compliance, then that provision may be unenforceable (e.g., a requirement that a system be operated in a particular manner where there is no one likely to be available to verify compliance). As such, it is a reason not to adopt the standard, a source of amendment, or something in the standard that is not followed.

**A3.1** **Indicating Who Performs a Required Test**

***Type II Hood Performance Test.*** *A performance test shall be conducted upon the completion of — and before final approval of — installation of a ventilation system serving commercial cooking appliances. The test shall verify the rate of exhaust airflow required by Section X. The permit holder shall furnish the necessary test equipment and devices required to perform the tests.*

Who is responsible for conducting the test? There are many entities (contractor, building owner, designer, hood manufacturer, inspector, etc.), who can conduct the required test, and, in not indicating the necessary qualifications of those considered appropriate to conduct the test, the standard is silent on that issue and provides no guidance to those adopting the ASHRAE standard. The need for standardization might not be important for those that only have to deal with such a test one time and in one place. But for those who design, construct, operate, own, insure, and perform other duties associated with this topic, the failure of the standard to provide specific guidance as to the qualifications of the intended responsible party for conducting the tests means there are likely to be as many different sets of guidance or requirements on this issue as there are adopting entities. Clearly, if practical, it is preferable for the ASHRAE standard to identify the responsible parties and their necessary qualifications where appropriate. As the developing organization, ASHRAE is in the best position to address this issue.

The following is a potential revision of the example above that focuses on identification of the responsible party:

***Type II Hood Performance Test.*** *A performance test shall be conducted by an approved third-party upon the completion of — and before final approval of — installation of a ventilation system serving commercial cooking appliances. The test shall verify the rate of exhaust airflow required by Section X and the test results provided by the approved third-party to the authority having jurisdiction over the final approval of the system. The permit holder shall furnish the necessary test equipment and devices required to perform the tests.*

**A3.2Who Provides Required Information**

***Supplemental Information.*** *Supplemental information necessary to verify compliance with this standard, such as calculations, worksheets, compliance forms, vendor literature, or other data, shall be made available where required by the building official.*

Who is required to make the supplemental information available (owner, contractor, registered design professional, manufacturer, etc.) and what qualifications must they possess? Without a designation of responsibility and qualifications, the enforcement authority (code official) is placed into the position of making the selection, which could delay the approval of a project if the standard does not designate a responsible party. The PC is in the best position to list those responsible for providing this information.

**A3.3 Who Provides a Required Report**

***General.*** *Construction documents shall require that all HVAC systems be balanced in accordance with generally accepted engineering standards (see Informative Appendix E). Construction documents shall require that a written balance report be provided to the building owner or the designated representative of the building owner for HVAC systems serving zones with a total conditioned area exceeding 5000 ft2.*

Who is responsible for providing the written balance report? Should the construction documents require that the balance report be provided and then be further required to designate the responsible party? The PC is in the best position to make this decision and put it into the standard instead of leaving the decision up to those adopting the standard by reference or those using the standard.

**A3.4 Who Performs Required Calculations**

***Load Calculations.*** *Service water heating system design loads for the purpose of sizing systems and equipment shall be determined in accordance with manufacturers’ published sizing guidelines or generally accepted engineering standards and handbooks acceptable to the adopting authority (e.g., 2011 ASHRAE Handbook — HVAC Applications).*

Who is responsible for determining the design loads? Again, the PC is in the best position to make the designation. In addition, there is one additional aspect of the provision above; there are no sizing limitations in the standard for the system. Once the loads are calculated, what would one do with them other than verify that they had been determined? In this instance, the standard could establish some criterion that is based on the load calculations; otherwise, why make someone responsible for determining the loads?

**A3.5 Who Provides Required Construction Documents**

***Drawings.*** *Construction documents shall require that within 30 days after the date of system acceptance, record drawings of the actual installation shall be provided to the building owner, including…*

***Manuals.*** *Construction documents shall require that an operating manual and maintenance manual be provided to the building owner. The manuals shall include, at a minimum, the following…*

Who is responsible for providing the required documents, or should the criterion be “….shall require that the registered design professional of record provide ….”?

**A4. Simple and Repeatable**

Ensuring the criteria in a standard are simple and repeatable is important because this affects the ability to understand, apply, implement, or document or verify compliance with a standard. In addition, the intent of a standard is to foster uniformity and consistency in the subject covered by the standard; this is adversely affected by the level of complexity in the standard. Where there are multiple paths to compliance with the standard, each path must be similarly repeatable and comparable. If not, users are more likely to take the path of least resistance and that path will become the singular path in the standard.

Examples of current standards provisions and suggestions for simplification are shown below. Where considering this issue, first focus on what is to be required in the standard and produce a first draft of a provision that is in accordance with the other issues described in this Annex. Once that is completed, determine if the text specifically communicates what is intended to be conveyed and that all involved will draw the same conclusion from reading the text. Then generate and evaluate alternative ways to further refine, simplify, and present the provision. As a final step, consider the need for consistency in the application and use of the text. Continue this process until there is a clear and concise statement that conveys the requirement.

**A4.1 Simplification - First Example**

***budget building design:*** *a computer representation of a hypothetical design based on the actual proposed building design. This representation is used as the basis for calculating the energy cost budget.*

In the revision of this definition below, the second sentence has been combined with the first to simplify the definition.

***budget building design:*** *a computer representation, used as the basis for calculating the energy cost budget, of a hypothetical design based on the actual design of the proposed building.*

Note also that it is not necessary to provide background, reasons, or informative statements for provisions in standards. Focus on limiting the text in a standard to the provisions that are necessary to meet the purpose of the standard. If the need for informative text, commentary and other language to explain what is in the standard or how it is to be used continues to arise, this may be a self-admission that there is a need to continue reviewing the core provisions in the standard to ensure they have been crafted in a simple and repeatable manner.

**A4.2 Simplification - Second Example**

***Inspections.*** *All building construction, additions, or alterations subject to the provisions of this standard shall be subject to inspection by the building official, and all such work shall remain accessible and exposed for inspection purposes until approved in accordance with the procedures specified by the building official. Items for inspection include at least the following:*

1. *wall insulation after the insulation and vapor retarder are in place but before concealment*
2. *roof/ceiling insulation after roof/insulation is in place but before concealment*
3. *slab/foundation wall after slab/foundation insulation is in place but before concealment*
4. *fenestration after all glazing materials are in place*
5. *mechanical systems and equipment and insulation after installation but before concealment*
6. *electrical equipment and systems after installation but before concealment*

Consider this simplified revision:

***Inspections.*** *Everything subject to the provisions of this standard shall be subject to inspection by the building official and shall remain accessible and exposed for inspection purposes until approved by the building official.*

The term “approved” has a specific meaning and definition in codes, so it would be advantageous to include it in the definitions section of the ASHRAE standard (*approved by the code official as a result of investigation and tests conducted by him or her, or by reason of accepted principles or tests by nationally recognized organizations*[[1]](#footnote-2)), thereby allowing the text to be simplified as shown above. Anytime a term or concept needs to be defined to facilitate understanding and use of the standard, it needs to be defined in the definitions section unless it is used only once, in which case, it can be addressed at the point in the standard where the term or concept is used. Also, given that this related set of standards is focused on minimum requirements, there is no need to list anything other than the minimum, so the text listed below could be deleted. Clearly, one need only read the standard to know that things are “subject to the provisions of the standard,” which is another reason for not listing them in the standard.

**A4.3 Clarification - First Example**

***clerestory:*** that part of a building that rises clear of the roofs or other parts and whose walls contain windows for lighting the interior.

What are “other parts?” Will designers, specifers, and code officials all have a uniform interpretation and application of this definition? Is the text “for lighting the interior” necessary? Does this mean that if the wall has a window but it is not for lighting the interior, then it is not a clerestory, and if not, then what is it?

**A4.4 Clarification - Second Example**

***Space Control.*** *Each space enclosed by ceiling-height partitions shall have at least one control device to independently control the general lighting within the space. Each manual device shall be readily accessible and located so the occupants can see the controlled lighting.*

1. *A control device shall be installed that automatically turns lighting off within 30 minutes of all occupants leaving a space, except spaces with multi-scene control, in*
2. *classrooms (not including shop classrooms, laboratory classrooms, and preschool through 12th grade classrooms),*
3. *conference/meeting rooms, and*
4. *employee lunch and break rooms.*

*These spaces are not required to be connected to other automatic lighting shutoff controls.*

Is it clear to what “these spaces” is referring? Is it the three listed spaces or the spaces enclosed by ceiling height partitions? Is the second sentence addressing manual devices confusing since the provision requires some spaces to have automatic controls and the opening sentence requires at least one control? Where composing provisions for a standard, it can be helpful to map out the intent and flow of the provisions via a diagram, and then, where that diagram matches the intent of those writing the standard, craft language to describe the diagram that then becomes the text for the standard. Such a logic statement might read as follows, which could then be transferred into text for the standard.

* Each space with ceiling height partitions must have at least one control to control only the lighting in that space
* Where that control is readily accessible and located so those in the space using the control can see the lighting that is controlled
* Where that space is a classroom, conference/meeting room, or employee lunch or break room that does not have multi-scene controls, then the control device must automatically turn off the lighting within 30 minutes of all occupants leaving the space and those spaces need not be connected to any other automatic lighting shutoff controls

**A4.5 Clarification for Consistency**

*Foundation vents shall not interfere with the insulation.*

While the intent may be generally understood, any 10 different individuals would likely visualize the application of this text differently and apply it differently. Recognize there are vents for ventilation but there may also be vents to reduce pressures of flooding on walls, so it is to some degree impossible to even verify this in the field unless those conditions exist. If the standard cannot clearly state what is required so most everyone can understand and apply the provisions uniformly, then evaluate the need for the provision. Alternative criteria such as “floor insulation must be installed so it is at least X in. above the top of any foundation wall vent” might be considered in this instance.

**A4.6 Clarification to Ensure Uniform Interpretation and Application**

***Insulation Protection.*** *Exterior insulation shall be covered with a protective material to prevent damage from sunlight, moisture, landscaping operations, equipment maintenance, and wind.*

For a given application, is it likely that there will be a uniform understanding of what constitutes a protective material and what UV, moisture, landscaping operations, and wind impacts must be addressed by that protective material? Would landscaping operations be known and capable of being evaluated at the time that compliance with this provision is conducted? Are they well enough known where performing an inspection of the exterior insulation? Without some additional specifics as to methods of protection and how protection performance is to be measured and expressed, the inclusion of this provision, while well intended, could easily be disregarded or cited as an example why the standard cannot be adopted by reference.

It is also relevant to simplicity and repeatability that standards, by definition, are intended to provide for consistency and comparability on the issues addressed in the standard. As discussed in the above examples, if there are multiple paths to compliance in a standard and the paths are not equal, then the path of least resistance becomes the standard. In developing a standard, it is important to establish clear minimum requirements even if multiple paths to compliance are desired. If the standard establishes criteria beyond specific minimums, this can adversely affect the simplicity of the standard and its adoptability by reference.

**A5. Consolidate Administration and Compliance Criteria**

Consolidation of administration and compliance criteria is simply the placement of all the provisions of a standard related to administration, compliance documentation and verification, and other matters not specific to the technical requirements in the standard in one place as stated in Section 2.2.5. This is important because the location of these provisions in one place in makes the standard easier for users to implement, apply and document or verify compliance with the standard compared to them being separately located throughout the standard, thereby increasing the chances that the standard will be adopted by reference.

Section A5.1 provided examples of provisions currently in an ASHRAE standard that relate to administration of the document within a building regulatory context. These appear throughout the standard at the point where they are considered relevant, but could be more appropriately included in a section on administration and compliance documentation and verification; an example of which is shown in Section A5.2. This helps those having to comply with the document and those enforcing the document to have a clearer understanding of how the document is to be administered and applied, and what is needed to document and verify compliance. Unless there is a unique and significant reason to keep one or more administrative provisions in a position adjacent to the technical requirement to which they apply, all provisions, such as those below, should be placed in the section in the standard on administration and compliance verification. Note that no attempt has been made to revise the actual text in these provisions.

**A5.1*.* Criteria Located Throughout A Standard**

***Motor Nameplate Horsepower.*** *For each fan, the selected fan motor shall be no larger than the first available motor size greater than the bhp. The fan bhp must be indicated on the design documents to allow for compliance verification by the code official.*

It is interesting to note that this is the first place in this particular standard where there is a specific requirement on the plans. It is advantageous to the application and use of a standard to list all those specific data requirements in one place in the administrative section of the standard.

***Drawings.*** *Construction documents shall require that, within 90 days after the date of system acceptance, record drawings of the actual installation provided to the building owner or the designated representative of the building owner. Record drawings shall include, as a minimum, the location and performance data on each piece of equipment, general configuration of duct and pipe distribution system including sizes, and the terminal air or water design flow rates.*

***Additions to Existing Buildings.*** *Service water heating systems and equipment shall comply with the requirements of this section.*

***Exception:*** *Where the service water heating to an addition is provided by existing service water heating systems and equipment, such systems and equipment shall not be required to comply with this standard. However, any new systems or equipment installed must comply with specific requirements applicable to those systems and equipment. (This type of provision—applicability of various parts of the standard to additions, renovations, etc., would seem to be fairly uniform throughout the standard. As such, it may be more appropriate to locate these provisions collectively in an administrative section and then make them more generic so they clearly state that anything new added to an existing building that replace something that pre-existed (e.g., a new piece of equipment or new controls) must meet the standard as applicable for new construction.)*

***Drawings.*** *Construction documents shall require that within 30 days after the date of system acceptance, record drawings of the actual installation shall be provided to the building owner, including*

 *a. a single-line diagram of the building electrical distribution system; and*

 *b. floor plans indicating location and area served for all distribution.*

***Manuals.*** *Construction documents shall require that an operating manual and maintenance manual be provided to the building owner. The manuals shall include, at a minimum, the following: (include a list of what is required).*

***Trade-Offs Limited to Building Permit.*** *Where the building permit being sought applies to less than the whole building, only the calculation parameters related to the systems to which the permit applies shall be allowed to vary. Parameters relating to unmodified existing conditions or to future building components shall be identical for both the energy cost budget and the design energy cost calculations. Future building components shall meet the prescriptive requirements of Sections x, y, or z.*

***Envelope Limitation.*** *For new buildings or additions, the building Energy Cost Budget Method results shall not be submitted for building permit approval to the authority having jurisdiction prior to submittal for approval of the building envelope design.*

**A5.2** **Combining and Organizing to Create a Focus on Compliance**

The example below is from a draft ASHRAE standard showing how the provisions associated with administration and compliance can be combined. Again, no attempt has been made to revise or change the wording to address any mandatory language or other code-intended language issues.

***4. ADMINISTRATION AND ENFORCEMENT***

***4.1 General.*** *Building projects shall comply with Sections x through y.*

***4.2. Application to Buildings***

***4.2.1 New Buildings.*** *New buildings shall comply with the provisions of Sections x through y as applicable.*

***4.2.2 Additions to Existing Buildings.*** *Additions to existing buildings shall comply with the provisions of Sections x through y as applicable.*

***4.2.3 Alterations of Existing Buildings.*** *Alterations of existing buildings shall comply with the provisions of Sections x through y as applicable to the scope of work associated with the alteration. Nothing in this standard shall require that any portion of an existing building not associated with the alteration be brought into compliance with this standard. Nothing in this standard shall require compliance with a provision of this standard if such compliance will result in the increase of energy or water consumption of the building or production of increased emissions or effluent of waste.*

*Exception: Any building or portion thereof that has been specifically designated as historic.*

***4.2.4 Changes in Occupancy or Space Use.*** *Spaces in a building that are converted to a different occupancy or use to an occupancy or use within the scope of this standard as covered in Section x and such conversion involves construction and approval by the authority having jurisdiction, those spaces shall be brought into compliance with all the applicable requirements of this standard.*

***4.3 Compliance***

***4.3.1 Administrative Requirements.*** *Administrative requirements relating to permit requirements, enforcement by the authority having jurisdiction, interpretations, claims of exemption, and rights of appeal shall be those specified by the authority having jurisdiction.*

***4.3.2 Technical Requirements.*** *The information shown in Table X shall be provided on the plans and specifications.*

Note that a Table X would be included based on the content of and requirements in the standard.

***4.3.3 Alternative Materials, Methods of Construction or Design.*** *The provisions of this standard are not intended to prevent the use of any material, method of construction, design, equipment or building system not specifically prescribed herein, provided they have been approved by the authority having jurisdiction as meeting the intent of this standard.*

***4.3.4 Validity.*** *If any term, part, provision, section, paragraph subdivision, table, chart or referenced standard of this standard shall be held unconstitutional, invalid or ineffective, in whole or in part, such determination shall not be deemed to invalidate any remaining term, part, provision, section, paragraph, subdivision, table, chart or referenced standard of this standard.*

***4.3.5 Other Laws.*** *The provisions of this standard shall not be deemed to nullify any provisions of local, state or federal law. Where there is a conflict between a requirement of this standard and such other law affecting design, construction or operation of the building, precedence shall be determined by the authority having jurisdiction.*

***4.3.6 Referenced Standards.*** *The standards reference in this standard and listed in Section x shall be considered part of the requirements of this standard to the prescribed extent of such reference. Where differences occur between the provision of this standard and referenced standards, the provisions of this standard shall apply.*

***4.3.7 Normative Appendices.*** *The normative appendices to this standard are considered to be integral parts of the mandatory requirements of this standard, which, for reasons of convenience, are placed apart from all other normative elements.*

***4.3.8 Informative Appendices.*** *The informative appendices to and the informative notes located within this standard contain additional information and are not mandatory or part of this standard.*

1. ICC International Energy Conservation Code, 2012 [↑](#footnote-ref-2)