SPECWORK

CSI® LITTLE ROCK CHAPTER

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In This Issue

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President's Thoughts

INow is the time for all good men to come to the aid of their country. That was the first full phrase we were taught in typing class when I was in high school. That's right, typing class, on real manual typewriters. There were no computers, printers, or any other of today's electronic paraphernalia. The closest thing to automation we had were electric typewriters. My school was not rich enough to have them for everyone, so ½ the class started on Manual typewriters and the other ½ worked on electric ones. The real fun came at the middle of the semester when we switched. The manual had to learn how to soft strike the keys on the electric after having to use brute force on the keys of the manuals. But the electric users had to get their fingers into shape, cut back their nails, and put a lot of effort into what was so simple to them when they were on the electrics. Sounds archaic, well that is just about where we are now in the Chapter. Many of the older, more seasoned veterans of the Chapter have retired, passed away, or moved on to other endeavors. With no younger generations to pick up the slack, we are in a crisis of leadership.

I have been talking over the past few letters of this, and it seems that there is nobody out there wanting to step up and take on the challenge. What this means to the Chapter is that at some point there will be no more people willing to lead the chapter, at which time it will be forced to turn in its charter and become a non-entity. I don't want to be known as the "Last President" of the Little Rock Chapter, so I still have hope that there is a core of younger people out there who are willing to take on this challenge bring this Chapter back to the "Glory Days" of old with a new look and a new attitude more in keeping with the Construction Industry of today.

So how do we get there from where we are right now. Simply put, we need at least 5 younger people, driven by a desire to improve their capabilities, knowledge, and experience, to step forward and begin the takeover of the Chapter Leadership. Those of us currently in the leadership roles will be there to mentor you and make sure that you are starting down the path correctly. Where you go from there, well that will be your determination. We will be here to help you, to provide you with guidance, and even make suggestions to try and make sure you don't make the same mistakes many of us made early on. But where the Chapter goes from here will be totally up to you. You will have a blank canvas to paint your leadership masterpiece. I can go on with the cliches' all day, but I think you catch the drift.

So who wants to take over??

What I Learned From CSI - Filter Out the Fuss: Nitrous Oxide is no Laughing Matter

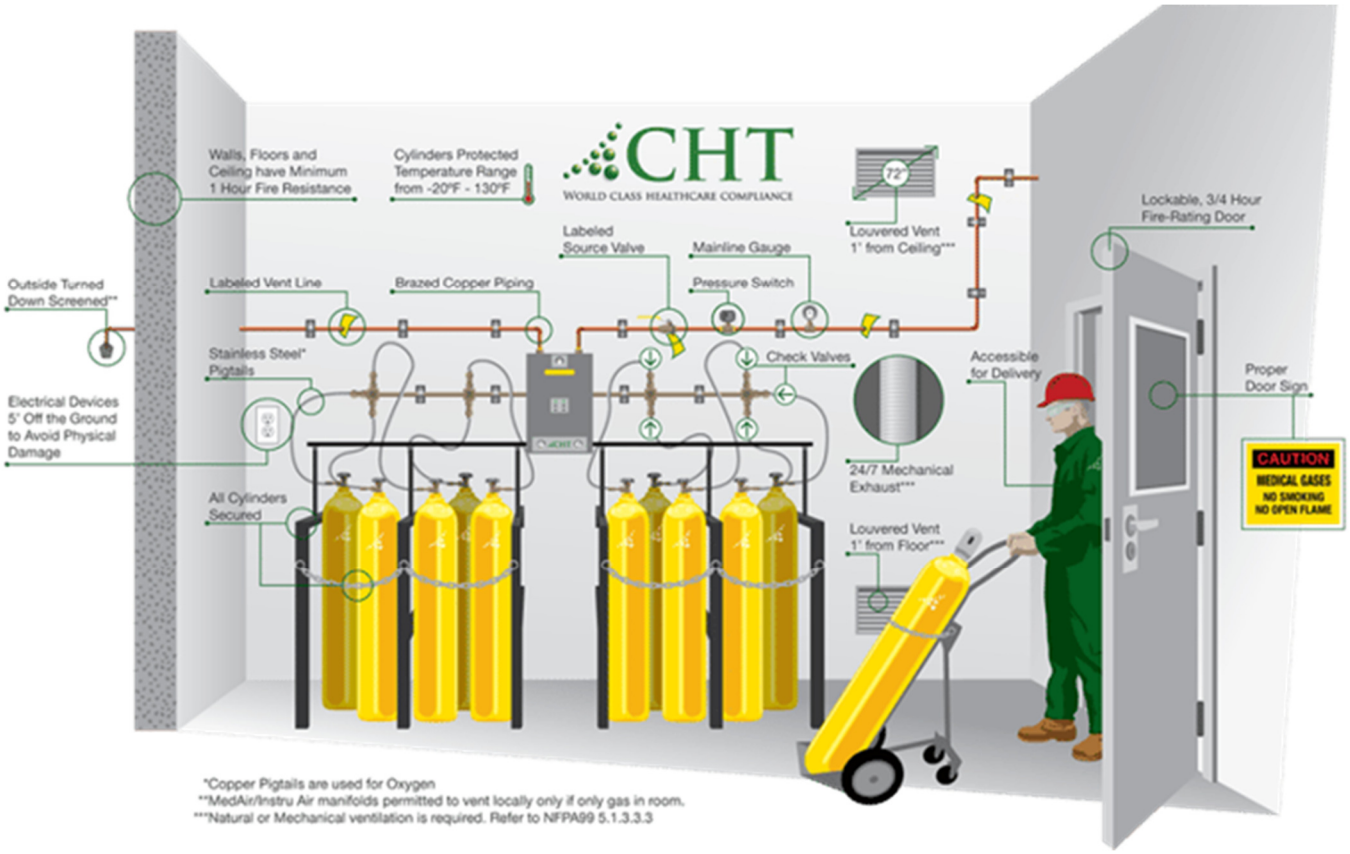
By: Gary Bergeron, CSI, CCS, GSR Technical Chair and Karina Kane, BARCH | University of Tennessee College of Architecture and Design

Many of us enjoy a real whipped cream topping on desserts and coffee. But how many of us realize the whipped cream is made by our favorite coffee shop with nitrous oxide and heavy whipping cream. If you observe your favorite barista topping your coffee, you'll see a small stainless container of heavy whipping cream being used to dispense the topping. These devices include a small nitrous oxide cartridge which is periodically replaced. Believe it or not, some people have discovered the artificial high from ingesting that nitrous oxide which is commonly known as laughing gas. These cartridges are known as “whippets”. There was a recent fire https://candleinc.org/a-risk-in-your-community/ at a whippet warehouse where the cartridges were heated to the point of exploding. Several cartridges were found more than a mile away. Some whippet manufacturers have started to offer larger containers of nitrous oxide with a subtle nod to being used for whipped cream production. There are several anecdotes of so much misuse of nitrous oxide that drug addicts have been hospitalized and have to learn how to walk again through intensive physical therapy.

As medical gas piping designers many mechanical engineers design several large bottles with manifolds to serve dental and other medical facilities. These distribution systems are designed per NFPA 99 which governs many elements of these medical gas systems. The nitrous oxide (used as anesthesia) and oxygen bottles are often secured in the same medical gas storage closet and are subject to usage and inventory control review. If you want to learn more about the design and construction industry, please attend your local, regional, or national CSI meetings. Please contact Gary Bergeron at Gary@kelso-regen.com for more information.

Whipped Cream dispenser

Whippet cartridges often sold at convenience



Medical gas bottle storage room detail

Specifications Language: Words to Avoid in Specifications

By: Kevin O'Beirne, PE, FCSI, CCS, CCCA, CDT

In resolving disputes between the parties to construction contracts, courts and arbitrators have frequently ruled that the wording of a construction contract, including its specifications, should be construed against the documents' drafter, which is typically the owner and its design professional. This is because courts and arbitrators typically, of necessity, interpret that the drafter of the construction documents exercised appropriate skill, care, and professional judgment in developing the construction documents, using deliberately chosen words and phrases.

This article presents words and phrases that should typically be avoided in construction documents, selected by this writer based on personal experience. Opinions and experiences by others may perhaps add to or delete from the words and phrases indicated below. This article is not intended as all-encompassing or comprehensive.

"All" and "Every"

Many drafters of specifications and other construction documents frequently employ words such as, "all" and" every". The likely rationale for this may be the desire to prohibit or limit contractor change proposals and claims that the drafter envisions will be submitted unless the contract language expressly indicates that requirements apply to "all" and "every" instance. However, terms such as "all" and "every" should typically be avoided, both because they are unnecessary and, when used inconsistently (as is often the case) can lead to unintended interpretations.

Contracts typically require that the contractor perform all of the work shown and indicated in the contract documents for the associated contract price. Accordingly, there is no need to repeatedly indicate "all" and "every", because the contract already requires that the contractor provide all of the work.

The true disadvantage of using "all" and "every" is when they are selectively used, rather than used consistently in virtually every provision of the specifications and other contract documents. Indeed, seeing the words "all" or "every" in virtually every paragraph of the specifications would become tiresome. Using such words in some provisions and not others has the potential for a court or arbitrator to determine that omission of the word from certain provisions was intentional by the drafter, and that the owner is due "all" of a certain work element or activity only when the word "all" or "every" was expressly indicated. Thus, by selectively using "all" or "every", a project owner and design professional may end up with a court or arbitrator determining that the contractor was obligated to perform "all the work" or "provide every item" only at locations where such phrasing was expressly used. One party might argue that "all materials" includes every possible material needed, while another might interpret it as only those explicitly indicated.

"And/or"

Due to its vagueness, "and/or" should not be used in construction documents. "And/or" is a grammatical conjunction used to indicate that one, more, or all of the cases it connects may occur. Taken literally, "and/or" means one or more, or all of a string of words is required or possible. As such, it is indefinite and vague. The interpretation of "and/or" in contracts has been addressed in various court and arbitration decisions, often highlighting the term's ambiguity.

For example, language in specifications may include, “Provide all necessary and/or required items for a complete system.” This could be interpreted as either, “Provide all necessary and required items…”, or “Provide all necessary or required items…” The first might be interpreted as requiring only necessary items as well as expressly required by the contract documents, which might be more exclusive and limited than may be intended by the drafter. The second might mean the contractor has the option to provide work that is either “necessary” or that is expressly required by the contract, but not both. Either of these interpretations is unlikely to be consistent with the intent of the owner and design professional. A better means of stating such a requirement might be, “Provide items as required, necessary, or both, for a complete system.”

“Any”

“Any” should be avoided in construction contracts because it is indefinite and vague. When used in specifications or contracts, “any” may be interpreted as allowing either contracting party to make a determination, which is probably not what is intended by the drafter. For example, a common expression observed by this writer in construction specifications is “fix any defects discovered after installation.” Such a requirement might be interpreted as meaning, “when one or more defects are apparent after installation, select any single one of them, provide an appropriate remedy, and you have complied with the entire requirement.” The foregoing would potentially relieve the contractor from remedying all of the defects except the one selected by the contractor. In most cases, the drafter probably intended, “when defects are apparent after installation, fix or remedy all of them.” Better wording would likely be, “remedy defects that become apparent following installation.”

“Attention of the contractor is directed to” and “special attention of the contractor”

Many construction specifications include phrasing that admonishes the contractor to pay particular attention, or, “special attention”, to a certain contractual requirement, site condition, or other item. Such expressions should typically be avoided, because they may be interpreted as elevating the importance of certain contractual provisions over others. The intent of most drafters of specifications and contracts is that equal weight should be given to all requirements, without one particular provision being construed as more important than others. Indeed, AIA A201—2017, Standard General Conditions of the Contract for Construction, Section 3.5 (“Warranty”), and EJCDC C-700—2018, Standard General Conditions of the Construction Contract, Paragraph 7.17 (“Contractor’s General Warranty and Guarantee”) each require that all the work shall comply with the contract documents and shall not be defective. Neither draws any special attention to certain elements of the work, because all parts of the completed construction must comply with the contract.

Accordingly, it is unnecessary to include language such as, “attention of the contractor is directed to”, or, “special attention of the contractor…”, using such language may have the potential to support a contractor’s subsequent contention that certain provisions of the specifications or contract were intended to be “more important” than others.

“Best”

The word, “best, should typically be avoided in specifications because it is likely to be interpreted as establishing a higher standard of quality than is actually required by the construction contract. This writer has seen numerous examples of construction contracts and specifications with phrasing such as, “materials, equipment, and construction provided shall be of the best quality.” Such a requirement may obviate the need for most of the specifications, which often require a level of quality somewhat less than the “best”. In fact, “best” is an exceedingly high, and typically very expensive, standard that may be nearly impossible to achieve. Furthermore, exactly how to determine whether an item or element of the work is “the best” may be subjective.

General conditions that are widely used in the United States do not require the subjective quality level of “best”. Rather, they require that the contractor comply with the contract documents. For example, Section 3.5.1 of AIA A201—2017, states in part, “The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise.” Similarly, Paragraph 7.04.B of EJCDC C-700—2018, requires “All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents.”

“Care should be taken”

Many specifications advise the contractor that, “care should be taken” while performing a particular work activity. While drafters of such language doubtless intend to helpfully highlight for the contractor certain aspects of the work that the drafter believes are critical for achieving the required quality or that represent a special hazard to persons or property, such language is often undesirable. As discussed above in this article’s section titled, “’Attention of the contractor is directed to’ and ‘special attention of the contractor’”, both AIA A201 and EJCDC C-700 clearly and expressly require that all the work comply with the contract documents and not be defective. Therefore, there is no advantage whatsoever to attempting to direct the contractor’s attention to certain work activities that require special care to achieve the required quality. Doing so may have potential for an interpretation that the contractor did not necessarily have to exert care in performing the work unless the specifications or contract explicitly required it.

Both Paragraph 7.13 (“Safety and Protection”) of EJCDC C-700—2018 and Article 10 (“Protection of Persons and Property”) of AIA A201—2017, make the contractor solely responsible for safety and protection measures associated with performing the work. Therefore, there is no need to direct the contractor’s attention to take particular care of performing any part of the work that has the otential to adversely affect the safety of persons or property. Again, highlighting that care should be taken in performing only selected activities could result in an interpretation that such care is mandatory only when the specifications or other contract document expressly calls the contractor’s attention to it.

“Conformance”

Many construction specifications include phrasing such as, “Perform [work activity] in conformance with the Specifications". The American Heritage Dictionary, Second College Edition (1985) is the ordinary dictionary on this writer’s shelf, and defines “conform”, in part, as: “…1. To correspond in form or character; be similar. 2. To act or be in compliance; comply. 3. To act in accordance with current customs or modes…” The same source indicates that, “comply” means: “…1. To act in accordance with another’s command, request, rule, or wish. 2. Obs. To be courteous or obedient…”. In January 2025, other, online dictionaries included very similar definitions of “conform” and “comply”.

As indicated by the definitions, above, the meaning of “comply” is quite clear, while the definition of “conform” varies between “comply” and, “To correspond in form or character; be similar.” Because of the somewhat ambiguous meaning of “conform”, which may be interpreted as requiring that the work merely, “be similar to” contractual requirements, in construction specifications and contracts, the word, “comply” should typically be used in place of, “conform”.

“Etc.”

“Etc.” is an abbreviation of, “et cetera”, which is a Latin expression meaning, “and other things”. Black’s Law Dictionary, Tenth Edition (2014) states, regarding “etc.”, “usu. [usually] means other, unspecified items in a series.” A key word of concern in the definition in Black’s is, “unspecified”. Exactly what is required in a contract or specifications that include the word, “etc.” is unstated and left to the interpretation of the reader. Indeed, courts and arbitrators rendering decisions have provided various interpretations of what is meant by “etc.” depending on circumstances. Therefore, “etc.” is unspecific, vague, and should not be used in contracts and specifications. In addition, using "etc." may appear unprofessional and suggest that the drafter did not take the time to fully articulate the terms of the contractual requirements.

Various alternatives may be employed in lieu of “etc.”. These include: (1) "Including but not limited to", which clarifies that the list provided is not exhaustive and other, similar items may be included; (2) "Such as", which can be used to give examples without implying that the list is complete; and (3) "And other similar items", which indicates the list includes similar items not explicitly mentioned. However, specifications and contracts are best when they are clear, specific, and unambiguous, so expressions like “including but not limited to”, “and other similar items” and “such as”, should be used rarely and with care.

“Fix” and “Repair”

A common requirement observed by this writer in many construction specifications is, to “fix [or repair] any defects”. Defective work means work that has either been damaged as a result of the contractor’s action or inaction, or that does not comply with the contract documents. As cited earlier in this article, Section 3.5.1 of AIA A201—2017, and Paragraph 7.04.B of EJCDC C-700—2018, each require that materials and equipment incorporated into the work shall be new and of good quality. AIA and EJCDC standard contract documents each also require that all work comply with the contract documents. Therefore, most project owners likely expect to receive completed construction that has not needed repairs or “fixing”. Some owners may envision a hack job when reviewing draft construction specifications that require either “fixing” or “repairing” defective construction. Project owners and design professionals most likely expect defective work to be remedied not as a repair, but rather to result in “like new” construction.

Rather than specifications language such as, “fix [or repair] any defects”, better wording would be, “promptly remedy defective Work”. The word, “remedy” means counteracting or eliminating something undesirable, without necessarily implying a repair. A remedy might include complete removal and replacement when necessary, an appropriate repair resulting in like-new construction, or other solutions.

“Is to”

“Is to”, and its shorter cousin, “to” (e.g., “contractor to promptly remedy defects”), should typically not be used in contracts and construction specifications, because such expressions do not constitute a definitive command or obligation. “Is to” appears to be either permissive or a statement of anticipation, rather than an explicit requirement that must be performed. Wording such as, “contractor to fix any defects”, might potentially be interpreted as meaning, “contractor might fix any defects,” “contractor ought to fix any defects,” or “contractor will fix any defects, one of these days, when the contractor feels like it”. None of these potential interpretations are likely what is intended by most drafters of construction specifications and contracts.

Many construction specifications use, “is to” or “to” rather than commands that more clearly communicate an obligation or requirement, such as “shall”, or “must”. For additional information on such terms, see Specifications Language: The Meaning of “Shall,” “Will,” and “Must”, previously published on this writer’s blog.

Legalese

Occasionally, construction specifications and contracts feature phrasing often known as legalese. In January 2025, “legalese” was defined in Mirriam-Webster’s online dictionary as, “the specialized language of the legal profession”, and, in the Cambridge online dictionary as, “language used by lawyers and in legal documents that is difficult for ordinary people to understand.” Selected examples of legalese include, “hereinafter”, “hereinbefore”, “notwithstanding”, “aforementioned”, “hereto”, “herein”, and others. More extreme examples include Latin terms such as “prima facie”, “estoppel”, “nunc pro tunc”, and others. Such terms should typically be avoided in construction specifications and most contracts, because construction contracts should be easily understandable by all project stakeholders. Inappropriate use of legalese may lead to interpretations that differ from those intended by the drafter. Using specifications and contract language understandable by ordinary people may also reduce the parties’ legal costs in the event of a claim or dispute.

The word, “herein”, is frequently employed in specifications and contracts. Its meaning may not be as obvious to all readers as its drafter might desire, because the meaning of “herein” can be vague: does it refer to “Here in this paragraph”? “Here in this article"? This section? Or anywhere in the contract as a whole? Accordingly, consider avoiding “herein” and, instead, indicate expressly what is intended, such as, “As indicated elsewhere in this Article, …”

“As per”

Some construction specifications employ, “as per”, and “per”, as synonyms for, “in accordance with” and similar phrases. For example, “Provide steel per ASTM A36.”

“As per” and “per” are best avoided for this context. While Black’s Law Dictionary, Tenth Edition (2014) indicates that, “as per”, when used in contracts, typically means “in accordance with”, it also describes, “as per” as a “barbarism”. The American Heritage Dictionary, Second College Edition (1985) defines “per”, in part, as “1. Through; by means of: per bearer. 2. To, for, or by each; for every: 40 cents per gallon. 3. According to; by: per instructions…”. None of the foregoing really means, “in accordance with”, although the third definition may perhaps be similar. To summarize, the meaning of “as per” and “per”, as replacements for “in accordance with” is unclear and ambiguous.

For clarity, use “in accordance with”, or a similar expression, rather than “as per” or “per”. For example, “Provide steel in accordance with ASTM A36.” Wording that is better and more succinct is, “Provide ASTM A36 steel.” The word, “per” should be used in specifications and contracts only to mean “by each”, as in “cubic feet per minute”. In specifications, it is often advisable to write out “per”, rather than abbreviate it with a slash (cubic feet/minute).

Pronouns

Pronouns such as, “it”, “its”, “itself”, “he”, “him”, “he/she”, “him/her”, “they”, “them”, “their”, “this”, “those”, “who”, and others, should be avoided in construction specifications and contracts, because of their ambiguity. However, this writer has seen too many examples of pronouns in specifications and contracts to count, such as: “Contractor and its employees shall, at all times, be under the control of its site superintendent. All employees shall report each day to him/her.” Pronouns should be avoided because the entity to which they refer is unclear, potentially setting the stage for requests for interpretations during the bidding/procurement stage and construction, as well as construction stage changes, claims, and disputes.

It is probably unreasonable to expect that every instance of a pronoun can be completely eliminated. However, gender-based pronouns can be, and likely should always be, avoided. Contractors include personnel of different genders. Pronouns in construction contracts are often masculine ("he" and "him"), but some entities, perhaps seeking a form of gender neutrality, employ, "he/her" and "he/she". Better phrasing for the example presented in the paragraph, above, is: "Contractor's site superintendent is responsible for actions and inactions of workers at the Site. Workers shall report to Contractor's site superintendent at the start of each work day."

"Requirements of"

Specifications and contracts frequently employ language requiring that a certain work result or performance obligation be, "in accordance with the requirements of" some other, particular specifications section or contractual provision. In such cases, the words, "requirements of", can be omitted without reducing clarity or the meaning of the provision. Although including the words, "requirements of", does not create ambiguity, such words are simply unnecessary and only add to the word count. Therefore, they are not necessary in specifications and contracts.

"Should"

"Should" is a permissive expression that is typically inappropriate in construction specifications and contracts. It allows the entity to whom the provision is directed, which is typically the contractor, discretion in whether to perform the associated requirement (for example, "contractor should promptly remedy defects."). When specifications and contract language follow CSI's drafting axiom that contractual language should be clear, concise, complete, and correct, specifications generally do not need to include advisories and discretionary language. Rather, such language should be limited to the express obligations of the contracting parties. Contractual language should be specifically directed to one of the contracting parties; in construction specifications, most of the language is directed to the contractor and indicates the contractor's obligations.

Although this writer has rarely seen it used, for the same reasons, specifications and contracts should avoid using the word, "could". Discretionary language should be avoided unless the intent is to allow the contractor the option of selecting from multiple alternatives for performing a particular work result. When indicating a contractual obligation, words such as, "shall" or "must" should be used (for example, "contractor shall provide bricks"), or, even better, indicative phrasing should be employed (for example, "provide bricks"). For additional information, see "Specifications Language: The Meaning of "Shall," "Will," and "Must", previously posted on this writer's blog.

Small Words

To streamline the language of specifications and contracts, "small words" such as, "the", "a" or "an", and the like can be omitted. While there is, grammatically speaking, nothing wrong with including such words, they add little to enhance the meaning and interpretation of specifications and contracts. For example, phrasing such as, "obtain written approval from the Owner and the Architect", should be shortened to, "obtain Owner's and Architect's written approval."

In some cases, "small words" may be needed, especially when referring to other elements of the construction documents. For example, wording such as, "in accordance with the Contract Documents", likely reads better than, "in accordance with Contract Documents". Whether or not to include "small words" needs to be determined on a case-by-case basis but, in many circumstances in specifications and contracts, "small words" should be omitted.

"So as to" and "in order to"

The expression, "so as to" is a synonym for, "in order to". Neither expression should be used in construction specifications or contracts, because, at best, they represent unnecessary verbosity and, at worst, may create the undesirable impression that the specifier should justify the requirements to the contractor. In the relatively rare circumstance where an expression like, "so as to" or, "in order to" is truly necessary, the shorter, "to", should be used. For example, when tempted to write, "Provide traffic controls so as to maintain safe roadway conditions," more succinct phrasing is, "Provide traffic controls to maintain safe roadway conditions."

"Strict"

This writer has reviewed numerous specifications on many projects employing words such as, "Perform [indicate work activity] in strict accordance with these Specifications and with applicable building codes." Undoubtedly, drafters of such language seek to communicate that the subject work activity is of critical importance, which is why such requirements must be "in strict compliance". The drawback of the selective use of "strict" is similar to the reasoning why the word, "all" should be avoided: its omission from other provisions might be interpreted as communicating that other requirements of the contract will not be "strictly" enforced. Of course, the intent of all construction contracts is that all of the work must be in full compliance with the contract documents.

The model language for scopes of services in widely-used professional services agreements indicates that, when the design professional is aware of defective work, they are to "reject" such work. Such provisions of professional services contracts and construction contracts do not indicate or imply that defective work will be rejected only when it fails to comply with provisions that are to be "strictly" enforced.

Thus, the word, "strict" should typically be avoided in specifications and contracts. Rather than using wording like, "Perform [indicate work activity] in strict accordance with…", the same meaning is communicated via, "Perform [indicate work activity] in accordance with…"

"To the satisfaction of"

A surprising number of construction specifications obligate the contractor to perform certain work activities, "to the satisfaction of Architect", "to the satisfaction of Owner", or "to the satisfaction of" somebody else. Such requirements are extremely vague and should be avoided. Bidders understandably are challenged in attempting to determine the cost of performing a certain work activity "to the satisfaction of" a particular person or entity not under the contractor's control. Exactly what might satisfy that person or entity is unspecified. Depending on how hard they are to satisfy, such vague contractual language could potentially allow the owner, design professional, construction manager, or someone else to establish new and, perhaps, very high standards for what would be necessary to result in "satisfaction". Thus, when used in construction specifications and contracts, the expression, "to the satisfaction of…", represents significant cost- and time-based risk to prospective bidders and the contractor. Frequent use of such wording, or using such an expression, for even one particularly expensive or challenging construction activity, has the potential to result in increased prices bid or proposed to the owner, as bidders will include hidden contingencies in their pricing in an attempt to cover their risk.

Rather than establishing ambiguous requirements, such as, "to the satisfaction of…", construction specifications and contracts should clearly indicate the required standards for performance and quality of the completed work. When specifications discuss matters that cannot be accurately foreseen at the time of contract drafting, such as provisions that address remedying defective work or restoration of damaged property, rather than using words such as, "to the satisfaction of…", alternative, better wording is, "in accordance with the Contract Documents", or other, more-objective wording.

Use With Care

The meaning of many other terms frequently used in specifications and contracts should be expressly indicated, to reduce the potential for misunderstandings and disagreements. Such terms include, “as directed”, “as required”, “as shown”, “as indicated”, and others. Additional terms whose meaning is often expressly indicated in contracts and, therefore, should be used properly and consistently, include, “furnish”, “install”, “provide”, “perform”, and others. The meaning of the latter terms is expressly set forth in Paragraph 1.02.E of EJCDC C-700—2018. Paragraph 1.02.B of EJCDC C-700—2018 also expressly indicates the meaning of “as allowed,” “as approved,” “as ordered,” “as directed”, “reasonable,” “suitable,” “acceptable,” “proper,” and “satisfactory”. Although AIA A201—2017 does not assign an express meaning to such terminology as does EJCDC C-700, most Division 01 specifications reviewed by this writer, intended for use with AIA A201, include language assigning a specific meaning to terms in language similar to that used in EJCDC C-700 Paragraph 1.02. Drafters of specifications and contracts that will, or may, include such words should ensure that the meaning of such terms is clearly addressed in the associated contract.

Specifications Language Resources

This article has narrowly focused on selected words that should be avoided in specifications and contracts. Many other resources are available that address both the topic of this article as well as the broader field of specifications language. While it is beyond the scope of this article to present a bibliography of resources, additional information is available in CSI’s Project Delivery Practice Guide, Third Edition (2020), especially in Section 5.3.3, “Specification Language”, and CSI’s Construction Specifications Practice Guide, Second Edition (2021), especially Section 11.8, “Specification Language”, and Section 15.4, “Specification Language”. In addition, articles on this writer’s blog addressing other topics related to specifications language, and content include:

Random Capitalization: A Risk of Misinterpretation

Numbers (Numbers) in Contracts and Specifications

Specifications Language: The Meaning of “Shall,” “Will,” and “Must”

Specifying Practices Coordinated is the Fifth “C”

Specifying Practices--Laws and Regulations in Construction Documents

Specifying Practices—Permits and Construction Documents

Conclusions

Many considerations apply to the language employed in construction specifications and contracts, including grammar, style, consistency with contractually-defined terms and terminology, and others. Words and expressions that should either be avoided or used rarely and after careful consideration, is a somewhat narrow slice of a larger topic but is one that is both very important and, perhaps, under-appreciated. Using words that are vague or can lead to unintended interpretations is an avoidable drafting practice that likely increases the overall project cost paid by the owner and transfers additional risk to the contractor. Specifications and contracts are best when they are clearly written and lend themselves to interpretations consistent with the original intent of their drafter.

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The author of this blog post is not an attorney and nothing in this blog post constitutes legal advice. Readers in need of legal advice should consult with a qualified, experienced attorney.

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What Would You Do? Which doors are required to be locked?

By: Mark Kuhn, I Dig Hardware Blog

In Mark Kuhn's next post, he asks a question that I've wondered about myself. I know of a few applications where the codes and standards require doors to be locked or lockable, but maybe there are others? Please share your insight in the comments!

I had an interesting call from an architect last week. What made it interesting was that most of the questions I receive are related to egress, fire or smoke. However, this question was about a mechanical room in an ambulatory clinic that the owner did not want to lock. So, the architect asked the question, "Are there doors that are required to lock?"

This was simple question, but a complicated one at the same time. It's so complicated that I'm going to ask you all, the loyal iDH readers, for some help with this.

I am aware of three places where a door is required to be locked or lockable:

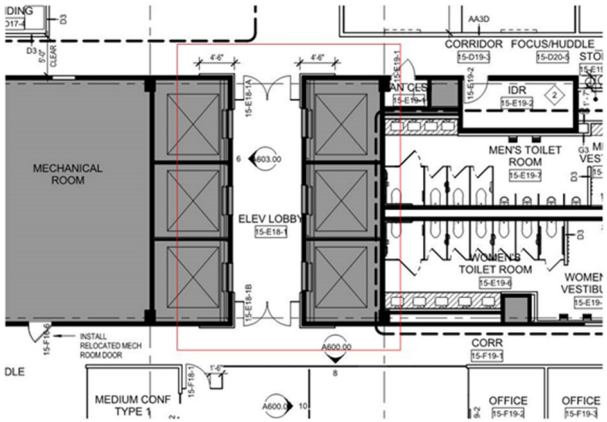
- **Elevator equipment rooms**: ASME A17.1 – Safety Code for Elevators and Escalators requires some elevator-related doors to be kept locked, and includes requirements for how those locks are keyed. For the specifics, check out this post.
- **Electrical rooms**: NFPA 70 – National Electrical Code tells us that for rooms housing certain types of electrical equipment, "Doors shall be equipped with locks, and doors shall be kept locked, with access allowed only to qualified persons…." There's more information about hardware for electrical rooms in this Decoded article.
- **Classrooms and other occupied rooms in educational facilities**: This is brand new and coming soon…the following text has been approved for the 2027 edition of the International Building Code (IBC): "1010.2.7.1 *Egress doors in educational occupancies. Egress doors from classrooms, offices, and other occupied rooms shall be provided with locking arrangements designed to keep intruders from entering the room and shall comply with all of the following:…"* You can read more about the upcoming change in this code update.

You may have noticed that only one of these examples is from the I-Codes and the other two examples are from other codes and standards, that as a "hardware guy" I am not as familiar with. This brings me to my question that I would like your help with…Do you know of any other code or standard that requires a door to lock, restricting access?

I just have one request, and it's the same requirement that is asked of me whenever I tell an architect or owner that there is a code that says this or that…Prove it! Along with leaving your example in the comments, please tell me the standard and section where the requirement is called out.

Quick Question: Locked Doors on Elevator Lobbies

By: Lori Green, I Dig Hardware Blog.



Today's Quick Question was raised because of changes made to the 2024 edition of the International Building Code (IBC):

What type of lock may be used to secure an egress door leading from an elevator lobby to an exit access corridor?

I can't tell you how exciting it is to be able to definitively answer a question because of a code change that was initiated by the Builders Hardware Manufacturers Association (BHMA) – and me!

Prior to the 2024 edition of the IBC, the code stated that elevator lobbies must have at least one means of egress complying with Chapter 10 and other provisions within the code. This often created a security problem when the means of egress from the elevator lobby led through a tenant space. The options were:

a) exit alarms to deter after-hours access from the lobby to the tenant space,

b) delayed egress locks if permitted for the applicable use group, or

c) push/pull hardware, passage sets, etc., that provided no security.

Since the 2009 edition, NFPA 101 has included a section addressing the means of locking elevator lobby doors to deter access to the tenant spaces, and several states and cities have modified their adopted codes to allow these doors to be secured. In the interest of consistency and to address current security needs and available technologies, BHMA proposed a similar section for the I-Codes. This proposal was approved and incorporated into the 2024 edition.

So…what types of locks would comply with the new section? The key considerations are that the hardware must be fail safe. The most common application would likely be an electromagnetic lock. Note that this code section does not require sensor release or door hardware release of the lock.

Fail safe electromechanical locks could be used, with the fail safe lever on the elevator lobby side of the door. If the doors are equipped with panic hardware, the controlled egress function could be used for doors swinging out of the lobby, or fail safe electrified lever trim for doors swinging into the lobby. If the door is not fire rated, a fail safe electric strike could be used with a mechanical lockset that is locked on the lobby side of the door.

In order to secure elevator lobby doors, all of the requirements of the adopted code must be met. This includes a two-way communication system installed in the elevator lobby. For detailed information about this new code section, refer to Decoded: Elevator Lobby Exit Access Doors. There is also a BHMA Codes in Context document on this topic available on BHMA's website.

Decoded: Automatic Sliding Doors

By: Lori Greene, I Dig Hardware Blog

In this month's Decoded column, I answered several questions about automatic sliding doors and the code requirements that help to ensure their safety in a means of egress.

Automatic sliding doors have become very common in health care facilities, mercantile, business, and residential occupancies, and in other types of buildings. There are specialized code requirements that apply to these doors when installed in a means of egress, in addition to other sections of the codes and standards that cover all types of doors. In this Decoded article I've answered a few of the frequently asked code questions about automatic sliding doors.

Where are automatic sliding doors addressed by the model codes?

In the 2024 editions of the I-Codes, Section 1010.3.2 is called Power-Operated Doors, and includes requirements for automatic swinging, sliding, and folding doors. This section requires automatic doors to comply with the ANSI/BHMA standards that address specific types of doors:

- A156.10 – Power Operated Pedestrian Doors
- A156.19 – Power Assist and Low Energy Power Operated Doors
- A156.38 – Low Energy Power Operated Sliding and Folding Doors.

Section 1010.1.2 specifies the types of doors allowed in a means of egress, requiring side-hinged swinging doors, pivoted doors, or balanced doors in most locations. There are nine exceptions detailing where other types of egress doors are allowed, and Exception 7 permits power-operated doors in accordance with Section 1010.3.2.

The 2024 edition of NFPA 101 – Life Safety Code addresses automatic doors in Section 7.2.1.9, Powered Door Leaf Operation, and requires compliance with the same ANSI/BHMA standards listed in the I-Codes. Based on these code sections, automatic sliding doors must meet the referenced A156 standards and the applicable sections of the adopted codes.

Although there are sections in each set of model codes dedicated to power operated doors, these are not the only sections that apply to automatic sliding doors in a means of egress. For example, the hardware used for security and egress – locks, latches, and special locking arrangements are covered in other sections of the model codes. This topic is addressed below.

When is an automatic sliding door required to have the break out / break away feature allowing it to swing in the direction of egress?

For power operated pedestrian doors that are not considered low-energy automatic doors, both sets of model codes require compliance with ANSI/BHMA A156.10, which includes requirements for automatic swinging, sliding, and folding doors, and defines the following terms:

- **Break Away Device**: A safety device other than an exit device that permits egress under emergency conditions (also called emergency release).
- **Break Out**: The process of activating a break away device causing the door or panel to swing in the direction of egress.

Automatic doors with this feature will swing open manually in the direction of egress if needed for emergency evacuation – automatic sliding or folding doors temporarily become manually operated swinging doors. The BHMA standard and the model codes limit the opening force for the break out feature to 50 lbf, applied 1 inch from the leading edge of the lock stile.

When and where this feature is required by the codes and standards depends on which of the model codes have been adopted and whether there are state or local modifications to those codes. In the 2024 edition of NFPA 101 – Life Safety Code, the "swing-out feature" is required by Paragraph 7.2.1.9.1.5: The door assembly shall be designed and installed so that, when a force is applied to the door leaf on the egress side, the door leaf shall be capable of swinging from any position to provide full use of the required width of the opening in which it is installed. However, Section 7.2.1.9.1.7 exempts automatic sliding doors from this feature when the door serves an occupant load of less than 50 people, as long as the door can be slid open manually within the force limitations stated in the code. Signage is required, stating "IN EMERGENCY, SLIDE TO OPEN."

In the 2024 edition of the International Building Code (IBC), Section 1010.3.2 includes the requirements for power operated doors to swing in the direction of egress during an emergency. Similar to NFPA 101, this section states (in part): ***The door shall be capable of opening from any position to the full width of the opening in which such door is installed when a force is applied to the door on the side from which egress is made.*** This is what mandates the break out or break away feature, but there is an important variation between the codes. The IBC does not include an exception similar to NFPA 101 that would exempt automatic sliding doors serving an area with a certain occupant load. It is possible that a code official MIGHT allow the break out / break away feature to be omitted if the door is serving an occupant load of 10 people or less, based on IBC 2024, Section 1010.3.2. Exception 9 of this section allows manually operated sliding doors serving areas with a calculated occupant load of 10 or less.

One other thing to note with regard to the break away requirement is that the I-Codes and NFPA codes include exceptions stating that the requirement for one leaf to provide a minimum clear opening width of 32 inches does not apply. The exceptions are slightly different, with the I-Codes requiring a minimum of 32 inches of clear opening width total (both leaves when broken out). The NFPA codes require each leaf to provide at least 30 inches clear.

What are the options for locking hardware on an automatic sliding door, and what affects the selection of this hardware for a door in a particular location?

Although the sections related to power operated doors do not specifically address locks and latches, there are other sections of the model codes that would apply. Typically, an automatic sliding door that requires a locking mechanism will have one of the types of hardware listed below. It would not normally be acceptable to have more than one lock on a door, for example, a hook bolt and panic hardware, as one motion must unlatch all of the locks and latches on the door simultaneously.

Hook bolt with key cylinder outside, thumbturn inside: The key cylinder and thumbturn are used to project or retract the bolt, which controls whether the door can slide open. This type of lock would have to meet the requirements for deadbolts in a means of egress:

- The application must be one where panic hardware is not required.
- The door would not be able to be fire-rated, as positive latching hardware would be required.
- The deadbolt must be the only locking/latching device on the door (unless it's the entrance door to a dwelling unit or sleeping unit, or other location where two releasing operations are allowed – not applicable to automatic sliding doors).
- The thumbturn and cylinder would have to be between 34 inches and 48 inches above the floor, or as required by the adopted codes.
- The thumbturn must be operable without tight grasping, pinching, or twisting of the wrist.

Double-cylinder hook bolt: In the model codes, these locks are called key-operated locks. A key cylinder on both sides can be used to project or retract the hook bolt, which controls whether or not the door can slide open. Key-operated locks are allowed by the I-Codes on a building's main entrance door(s) and tenant entrance door(s), where certain requirements are met (the NFPA requirements are similar – refer to the adopted code):

- According to the IBC, the use group must be one of the following:
- Assembly occupancy with an occupant load of 300 people or less,
- Business, factory, mercantile, or storage occupancy, or
- A place of religious worship.
- The locking device must be readily distinguishable as locked – typically the lock will have an indicator which reads "open" or "locked."
- Signage on the egress side of the door or adjacent to the door must state "THIS DOOR TO REMAIN UNLOCKED WHEN THIS SPACE IS OCCUPIED." The letters on the sign must be at least 1 inch high on a contrasting background. This signage serves as a reminder to employees, but also advises the public that the door must be unlocked when they are present.
- A building official may revoke the use of a key-operated lock for due cause.

Panic hardware: Depending on the use group or occupancy classification and the calculated occupant load of a space, egress doors serving that area may require panic hardware. The specifics depend on the adopted code:

- I-Codes: Each door in a means of egress equipped with a lock or latch, serving assembly (Group A) or educational (Group E) occupancies with a calculated occupant load of 50 people or more, and high hazard (Group H) occupancies of any occupant load.
- NFPA Codes: Required means of egress doors equipped with a lock or latch, serving assembly, educational, or day care occupancies with a calculated occupant load of 100 people or more, and areas of high hazard contents with a calculated occupant load in excess of 5.
- Note that the double-cylinder / key-operated lock described above may be allowed as an alternative to panic hardware if certain criteria are met.

Access control / free egress: When a door is equipped with electrified hardware that controls access but does not affect egress, it must meet the same requirements that apply to mechanical hardware:

- The door must unlatch with one releasing motion for egress (with some exceptions).
- Egress must require no key, tool, special knowledge or effort.
- Operation of the door hardware must require no tight grasping, pinching, or twisting of the wrist.
- Operable force for the hardware must be within the limits of the applicable code or standard.
- Releasing hardware must be mounted between 34-48 inches above the floor, or as required by the adopted code.

An automatic sliding door could also have electrified hardware that is considered a “special locking arrangement.” There are specific code sections addressing each of these applications, such as delayed egress locks, controlled egress locks in health care facilities, elevator lobby exit access doors, and electrified hardware that is released by a sensor or by a switch in the door-mounted hardware.

Do the code requirements for “special purpose” doors apply to the automatic sliding doors typically found on a building entrance?

In the 2024 edition of the IBC, Section 1010.3.3 is called Special Purpose Horizontal Sliding, Accordion or Folding Doors. These are not the typical automatic sliding doors that are found on many building entrances. This section applies to the type of door that is normally hidden behind a panel in the wall, and projects across a corridor or other opening upon a signal from the fire alarm / sprinkler system or security system.

For additional questions related to automatic sliding doors, refer to the adopted codes and referenced standards, or consult with the Authority Having Jurisdiction (AHJ).

Decoded: Listings for Electrified Hardware

By: Lori Greene, IDig Hardware Blog

In 1903, Underwriters Laboratories (UL) published their first safety standard, for tin-clad fire doors. Twelve decades later, the organization has developed more than 1,700 standards for a wide range of products. Most members of the door and hardware industry are familiar with at least two of the UL standards that are referenced by the model codes:

- **UL 10C, Standard for Positive Pressure Fire Tests of Door Assemblies**: The model codes require side-hinged or pivoted swinging fire door assemblies to be tested in accordance with either UL 10C or NFPA 252, Standard Methods of Fire Tests of Door Assemblies. For tests conducted in accordance with NFPA 252, the fire test must follow the positive pressure method specified in the standard. These standards test the fire endurance of a swinging door, frame, and hardware assembly, to verify the assembly's capability of preventing the passage of fire. Each component of a fire door assembly must be listed for this purpose.
- **UL 305, Standard for Panic Hardware**: The model codes require panic hardware and fire exit hardware to be listed to UL 305, passing the endurance, emergency operation, elevated ambient exposure and low temperature impact tests described in the standard. The purpose of this test standard is to verify quality components and design, as well as the strength and ability of the latches and actuating hardware under load. A product that has not successfully achieved this listing can not be installed in locations where the adopted code requires panic hardware listed to UL 305.

The model codes require electrified hardware used in special locking arrangements to be listed in accordance with UL 294 or UL 1034; this alternative is new in the 2024 model codes.

Of the more than 50 UL standards referenced by the model codes, there are two UL standards related to electrified hardware that have caused confusion since they first began to appear in the model codes starting with the 2009 editions:

- **UL 294, Standard for Access Control System Units**: This standard defines the minimum requirements applicable to the construction, performance, and operation of access control systems, including tiered characteristics to meet four levels of security performance.
- **UL 1034, Standard for Burglary-Resistant Electric Locking Mechanisms**: The requirements of this standard apply to the construction, performance, and operation of burglary-resistant electric locking mechanisms and related devices used to secure and release doors.

Below are answers to some frequently asked questions regarding the UL 294 / UL 1034 listings for electrified hardware:

Do the model codes require/permit electrified hardware to have either the UL 294 or UL 1034 listings?

Beginning with the 2009 edition of the NFPA codes and the 2012 edition of the I-Codes, the UL 294 listing was required for certain types of electrified hardware systems, typically the "special locking arrangements." For example, in 2021 edition of the IBC, the section addressing delayed egress locks states: The delayed egress locking system units shall be listed in accordance with UL 294.

This language, found in several sections of the model codes, was changed in the 2024 editions. In the 2024 IBC, the delayed egress section states: The electromechanical or electromagnetic locking device shall be listed in accordance with either UL 294 or UL 1034.

This change means that when a jurisdiction has adopted an edition of the I-Codes or NFPA codes between 2009 and 2021, the code would require the UL 294 listings for certain types of systems. When a jurisdiction adopts the 2024 editions or when allowed by the authority having jurisdiction (AHJ), either the UL 294 or UL 1034 listings would be acceptable for the applicable systems.

Do all components of the applicable systems require these listings?

Referencing the excerpts above, this question was also clarified by the changes made in the 2024 model codes. The 2021 IBC required the listing for "delayed egress locking system units", but it was unclear which components would need to be listed. Would the power supply, power transfer, switches, etc., be considered delayed egress locking system units? The 2024 IBC clearly states that the electromechanical or electromagnetic locking devices must be listed; the other components of the system would not require the listing.

Which types of electrified hardware systems require these listings?

The following table illustrates which sections in the 2024 model codes require the electromechanical or electromagnetic locking hardware used in these systems to be listed to either UL 294 or UL 1034.

2024 I-Codes	**2024 NFPA 101**	**Application**
1010.2.10 Door hardware release of electrically locked egress doors	7.2.1.6.3 Door hardware release of electrically locked egress door assemblies	Electrified locking hardware (typically electromagnetic locks) that are released by a switch in the door-mounted hardware
1010.2.11 Sensor release of electrically locked egress doors	7.2.1.6.2 Sensor -release of electrical locking systems	Electrified locking hardware (typically electromagnetic locks) that is released by a sensor to allow egress
1010.2.12 Delayed egress locks	7.2.1.6.1 Delayed egress electrical locking systems	Delayed egress locks that release within 15 seconds after actuation of the release timer (or 30 seconds when approved by the AHJ)
1010.2.13 Controlled egress doors in Groups I-1 and I-2	18.2.2.2.5.3/19.2.2.2.5.3 Controlled egress door locking arrangements in health care facilities	Electrified locking of egress doors in certain types of units in a health care facility
1010.2.14 Elevator lobby exit access doors	7.2.1.6.4 Elevator lobby exit access door locking	Elevator lobby doors that unlock during a fire alarm to allow occupants of the elevator lobby to pass through a tenant space to reach an exit
N/A – The section of the I-Codes applicable to stairwell re-entry does not currently require the listings.	7.2.1.5.7 Stair Enclosure Re-entry	Stairwell doors that are electrically locked on the stair side and must release for re-entry

Note: NFPA 101-2024 requires the listings for "new installations", but this is not specifically stated in the section addressing elevator lobby systems. In addition, the health care chapters of NFPA 101-2024 do not reference UL 294 / UL 1034 in the code, instead requiring the hardware for new electric lock installations to be "listed for the purpose." The UL listings are referenced in the Annex A paragraphs for the sections addressing controlled egress in health care facilities.

Which types of electrified hardware systems do not require these listings?

It is important to refer to the adopted codes to verify whether the listings are required or which listings are permitted. For example, the IBC does not currently require these listings for stairway doors with electrified locks for reentry, but NFPA 101 does. And depending on which edition of a code has been adopted, UL 1034 may be an acceptable option to UL 294, or the adopted code may require UL 294 without allowing UL 1034 as an alternative. State and local codes may also be modified to include different requirements.

Electrified hardware that allows free egress via normal operation of the hardware is not considered a special locking arrangement, and is not required by the model codes to carry the UL 294 or UL 1034 listings.

While most electrified locking hardware is listed to either UL 294 or UL 1034, the most common type of access control system is not required by the model codes to carry either listing. In contrast with the special locking arrangements which might have an effect on egress, the most common electrified hardware application allows free egress regardless of the status of the access control system. These systems are often called "normal locking arrangements." The electrified locks used in these applications are not required by the model codes to be listed to UL 294 or UL 1034, if the doors are readily openable from the egress side without the use of a key or special knowledge or effort.

Keep in mind that the model codes may require a particular hardware item to be listed to more than one standard. For example, according to the 2024 model codes, delayed egress panic (fire exit) hardware installed on a fire door assembly would need the UL 305 listing for panic hardware, the UL 10C listing for fire door assembly components, and either the UL 294 or UL 1034 listing. To determine whether a product carries the required UL listing, refer to UL Product iQ and the Intertek Directory of ETL Listed Products.

Decoded: Safe Dispersal Area Within a Fence or Enclosed Court

By: Lori Greene, IDig Hardware Blog

I originally wrote this article nine years ago (how can that be???), but I'm receiving a lot of questions related to this topic. Given the security concerns of schools and other facilities, it's important to understand when the egress path is allowed to lead to an area enclosed by a fence and when the means of egress must continue through gates in the enclosure to reach the public way. I have updated this article based on current code requirements.

A few years ago, I worked as the hardware consultant on a data center project with extremely high security. On the interior door openings, there were many challenges and conflicts between the code requirements which mandated free egress and the need for security methods that included interlocks, delayed egress locks, and several levels of access control.

A security fence surrounded the building, with access control readers at the vehicular and pedestrian entrances to the site. In order to maintain this secure perimeter, the security consultant did not want to allow free egress through the gates that led to the public way. Because the paths from the building's exterior doors to the public way are part of the means of egress (this portion is called the exit discharge), any gates encountered before reaching the public way would typically be required to comply with the egress code requirements. These include the mandates for one releasing motion to release the latch(es), no special knowledge or effort, no tight grasping/pinching/twisting of the wrist, and operable hardware mounted between 34 and 48 inches above the floor or ground.

Exterior gates are notoriously difficult to secure while providing free egress when required by the model codes. Locking/latching hardware may be defeated from the secure side of the gate, and many gate designs cannot easily accommodate the door closers needed to keep the gates closed and latched. Electrified hardware used on exterior gates can create additional challenges, due to exposure to the weather as well as unauthorized access to the release devices (like actuating the motion-sensor release for an electromagnetic lock from the secure side of the gate).

With today's focus on security for schools, office buildings, and other types of facilities, it will likely become more common to see a building completely surrounded by a fence. Each opening in the fence that is equipped with hardware allowing free egress becomes a potential access point – for authorized or unauthorized individuals. While I am not recommending that we surround every building with a fence, or that there should be no gates to provide egress from the contained area, the International Building Code (IBC) does address this situation.

In recent editions of the IBC, this is covered in section 1028.5 – Access to a Public Way, which requires the exit discharge to provide direct and unobstructed access to a public way; typically the public way is a street or alley. The exception to this section states that when access to a public way can't be provided, a safe dispersal area is required, where building occupants can wait for fire department assistance. This safe dispersal area – a location within the fenced area or enclosed court – must meet the following requirements:

- The safe dispersal area must be large enough to provide at least 5 square feet of space for each building occupant (see below for variations on this requirement for stadiums and I-2 occupancies).
- The area must be on the same lot and at least 50 feet away from the building, accessed by a safe and unobstructed path.
- The area must be permanently maintained and identified as a safe dispersal area, and cannot be used for another purpose such as parking, storage, or temporary structures (these limitations on the use of the area are found in the IBC Commentary).

If these criteria are met, the fence surrounding the building would not be required to have gates that allow free egress, as the building occupants can gather safely in the enclosed area and wait for emergency responders to arrive.

For stadiums, the IBC (Section 1010.2.1 in the 2015 and 2018 editions, Section 1010.4.1 in the 2021 and 2024 editions) describes a safe dispersal area that provides at least 3 square feet per occupant, located a minimum of 50 feet from the enclosed area of the stadium. If this safe dispersal area is provided, and if the stadium gates are under constant supervision when the stadium is occupied by the public, then panic hardware is not required to be installed on the stadium gates.

The IBC addresses secured yards for Group I-2 occupancies (hospitals, nursing homes, psychiatric hospitals, detox facilities, and foster care facilities) in a separate section of the code (407.9 in the 2015 IBC, 407.10 in the 2018, 2021, and 2024 editions). This section requires the safe dispersal area for I-2 occupancies to provide at least 30 net square feet for each bed and stretcher care recipient and 6 net square feet for ambulatory care recipients and other building occupants; as with other occupancy types, the safe dispersal area must be at least 50 feet away from the building. The use of a fenced area that is sufficiently sized for use as a safe dispersal area can be especially helpful for memory care units and behavioral health facilities, where a secured yard is often provided for the use of care recipients. In an emergency, this enclosure can provide a safe alternative to allowing care recipients to freely evacuate to a public way.

NFPA 101 – The Life Safety Code includes some language similar to the IBC, but only in relation to Detention and Correctional occupancies. In these facilities, sections 22.2.7 (new) and 23.2.7 (existing) allow exits to discharge into an enclosed court. Not more than two walls of the courtyard may be walls of the building, and the enclosed court must be large enough to provide a net area of 15 square feet per person at least 50 feet from the building.

The local codes and the Authority Having Jurisdiction (AHJ) should be consulted to verify the requirements for a specific jurisdiction. For sites where the requirements for a safe dispersal area cannot be met, gates which are properly sized, remotely located, and equipped with hardware that meets the egress requirements will likely be needed.

Decoded: Safe Dispersal Area Within a Fence or Enclosed Court

By: Lori Greene, IDig Hardware Blog

This pair of doors has been changed to a single door with a fixed panel. The AHJ must be consulted before a

A common question when replacing doors and hardware during a renovation is whether one leaf of a pair can be "fixed" in place, or whether an opening can be eliminated completely. It's very risky to make this decision without consulting the Authority Having Jurisdiction (AHJ), but it is helpful to understand some of the factors that could affect the location, size, and quantity of required exits before preparing your request for the AHJ.

Generally, the International Building Code (IBC) requires each space to have at least two exits or exit access doorways, and Chapter 10 states, ***"It shall be unlawful to alter a building or structure in a manner that will reduce the number of exits or the capacity of the means of egress to less than required by this code."*** But the required number of exits / exit access doorways may be increased or decreased depending on several factors:

- For rooms or spaces with a low occupant load, one exit may be acceptable. For example, Table 1006.2.1 in the 2024 edition of the IBC allows a single exit for assembly, business, educational, factory and industrial, mercantile, and utility occupancies with an occupant load of 49 or less, if the common path of travel is within a certain length.
- For larger spaces in these use groups with an occupant load of more than 49, a second exit would be required.
- For spaces with a high occupant load, the IBC requires additional exits – a minimum of 3 exits for any space with an occupant load of 501 to 1,000, and 4 exits if the occupant load is more than 1,000.
- Consult the code for information specific to your project, as there are several exceptions to these requirements.
- In recent editions of the IBC, Section 1005 covers Means of Egress Sizing, including sizing for stairways and "other egress components" – doors, gates, corridors, aisles, and ramps. The required egress width for these "other" components of an egress route is calculated by multiplying the occupant load served, by the egress capacity factor (note that stairways have a different egress capacity factor):
- For buildings without a sprinkler system and emergency voice/alarm communication system – the egress capacity factor is 0.2 inches per occupant.
- For H (high hazard) and I-2 (institutional – typically hospitals and nursing homes; refer to the code for the full definition) – the egress capacity factor for doors is 0.2 inches per occupant.
- For other use groups (H and I-2 excluded) with a sprinkler system and emergency voice/alarm communication system – the egress capacity factor for doors is 0.15 inches per occupant.

For example, if the occupant load of a nonsprinklered space is 300 occupants, the required egress width of the exits or exit access doorways serving that space is 300 occupants x 0.2 inches per occupant = 60 inches. So the egress doors serving that space must have a total of 60 inches of clear width. This doesn't mean that an equal pair of doors providing 30 inches of clear width each is sufficient, because of the requirements for multiple exit locations and minimum clear width (read on).

To determine the egress capacity of a door, or how many people a door will accommodate, divide the clear opening width of the door by 0.2 inches per occupant or 0.15 inches per occupant (see above to choose which factor to use). For example, if a door in a nonsprinklered building has a clear opening width of 32 inches, the egress capacity of that door would be 32 inches / 0.2 inches per occupant = 160 occupants.

The clear opening width of a door is measured from the face of the door with the door open 90 degrees, to the stop on the strike jamb of the frame. For pairs of doors, the clear width of the active leaf is measured from the face of the door to the removable mullion or to the edge of the inactive leaf in the closed position. To calculate the egress width of the entire opening for a pair without a mullion, measure between the faces of both doors when open to 90 degrees.

If you're looking at a door on a set of plans rather than measuring the clear width of an existing door, the exact clear opening width can vary slightly depending on the hinges or pivots. But a rule of thumb to find the nominal clear opening width for a single door hung on full mortise hinges is to take the frame opening width and subtract half of the hinge width, the hinge backset, and the height of the stop on the strike jamb. So for a 3-foot door that is hung on 4 1/2-inch-wide hinges with a ¼-inch hinge backset and a 5/8-inch stop, the calculation would be 36 inches (frame opening width) – (2 ¼ inches (half of the hinge width) + ¼ inch (hinge backset) + 5/8 inch (frame stop)) for a total of 32 7/8 inches of clear width.

Remember, doors in a path of egress and doors on an accessible route are typically required to have a clear opening width of at least 32 inches. In some cases this required width is increased for doors in health care facilities, or may be decreased for some existing doors. For pairs of doors, at least one leaf is required to provide the 32-inch clear width unless the applicable code or standard contains an exception that would allow an alternative.

The method used by NFPA 101 – The Life Safety Code to calculate egress capacity is the same, but the egress capacity factors vary slightly from those of the IBC:

- *For nonsprinklered health care occupancies, the egress capacity factor is 0.5 inches per occupant.*
- *For occupancies with high hazard contents, the egress capacity factor is 0.4 inches per occupant.*
- *For all other occupancies, the egress capacity factor is 0.2 inches per occupant.*

There are additional factors that may affect the size and location of egress doors, such as limitations on travel distance and the common path of travel, as well as the requirement for exits to be remotely located from each other. These requirements will be covered in the next edition of Decoded.

Looking Ahead to the 2027 I-Codes

By: Lori Greene, IDig Hardware Blog

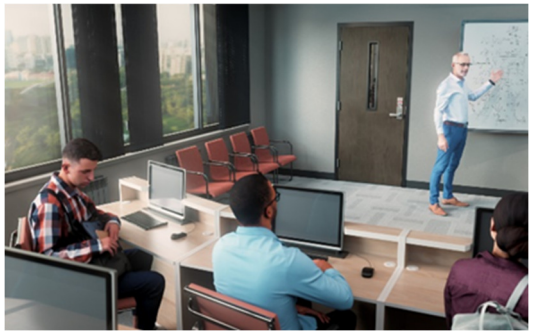
The model codes that are used as the basis for most US state building codes and fire codes are published by the International Code Council (ICC) and the National Fire Protection Association (NFPA). The codes that we commonly refer to for requirements related to door openings are the International Building Code (IBC), the International Fire Code (IFC), and NFPA 101 – Life Safety Code.

These codes are revised on a 3-year schedule, with the code development cycle consisting of the submission of proposals, several rounds of technical committee hearings and public comments, resulting in the approval of the new model codes. States and local jurisdictions may then adopt these codes, often modifying them to include requirements that are specific to the jurisdiction.

Many states have already adopted the 2021 editions of the model codes, and the 2024 editions are now available for adoption. The code development cycle for the 2027 model codes is underway, and the Builders Hardware Manufacturers Association (BHMA) Codes, Government, and Industry Affairs Committee (CGIA) has submitted several dozen code change proposals for consideration. In addition, the committee monitors proposals submitted by other organizations and individuals, to determine their impact on the door and hardware industry.

Several important changes and clarifications have already been approved for inclusion in the next editions of the I-Codes and are expected to become part of the IBC and IFC. While changes do not apply until the code is adopted in a particular jurisdiction, they are often used as a basis for requests for modifications submitted to the Authority Having Jurisdiction (AHJ). Many changes are actually clarifications to help with consistent interpretations and enforcement. These clarifications may be helpful even before the new codes are published.

This article will cover just two of the many changes to the 2027 I-Codes that once finalized will impact doors and hardware. For complete information on the ICC code development process, refer to ICCsafe.org.



Mandatory Locks in Educational Facilities (Proposal E57-24)

During the code development cycle for the 2018 model codes, the topic of safely locking classroom doors in educational facilities was discussed at length. While some proponents of classroom barricade devices suggested that the code requirements for egress should be compromised in favor of security, many opposed that view. Locksets have provided the necessary level of security in past school shootings, while also meeting the code requirements for egress, fire protection, and accessibility.

A section was added to the 2018 I-Codes, called “Locking arrangements in educational occupancies.” This section addressed Group E and Group B educational occupancies (schools, colleges and universities) – specifically doors serving classrooms, offices, and other occupied rooms. These spaces are permitted to have locks designed to keep intruders from entering the room, if certain criteria are met.

One important change to the 2018 edition of the model codes was to require these doors to be capable of being unlocked from outside of the room with a key or other approved means. This allows school staff and emergency responders to quickly enter the room to render aid. The new section also reiterated that these doors must be openable from within the room in accordance with the requirements of Section 1010.1.9. Among other requirements, this section mandates doors that open for egress one releasing motion, without a key, special knowledge, or effort, and without tight grasping, pinching, or twisting of the wrist.

The requirements of this section of the I-Codes did not change much from the 2018 edition to the 2021 and 2024 editions. Doors in schools and other educational facilities are permitted to be locked, as long as they allow authorized access, free egress, and comply with the accessibility standards. Unfortunately, several school shootings have occurred that demonstrated the need for additional code changes.

Beginning with the 2027 edition of the IBC, doors in schools, day care centers, colleges and universities will be **REQUIRED** to be lockable, rather than being permitted to be lockable. The requirements apply to classrooms, offices, and other occupied rooms in the applicable use groups. In addition to the mandates of this section that were included in the previous editions, the 2027 IBC will state: *"The doors shall be capable of being locked from inside the room."*

The new code will also include locking requirements for exterior entry doors in these facilities. Exterior doors must be lockable from the egress side of the door – opening the door to lock or unlock the outside trim will not comply. This section will also require at least one door on each building face to be able to be unlocked from the outside with a key or other approved means.

These modifications to the 2027 IBC will help to ensure that doors serving schools will be lockable without opening the door and will allow emergency responders to enter. This will enhance security and safety protocols for students and staff, facilitating lockdown and reducing emergency response time.

Interlocks in a Means of Egress (Proposal E61-24)

An interlock (AKA control vestibule, airlock, or mantrap) is a vestibule with two or more doors in series, where only one door can be opened at any given time. This application is commonly used to limit air transfer or for security. For example, in a data center, a control vestibule may be used to slow the passage of technicians for verification of their identity. The technician opens one door to enter the vestibule, which causes the other door(s) to lock until the first door closes. The technician can then open another door to exit the vestibule. Interlocks are also frequently used in laboratory clean rooms and infection control areas in health care facilities.

Electrified hardware is used to facilitate the coordination of doors in a control vestibule. The most common application would include electromagnetic locks on each door, controlled by door position switches. When one switch signals an open door, the mag-lock on the other door locks until the switch signals that the open door has come to a close. Other types of fail safe electrified locks could also be used in this type of system.

Current model codes do not include prescriptive requirements for interlocks in occupancies other than detention/correctional – each proposed control vestibule must be submitted to the AHJ for approval. This can lead to inconsistent operation from one project to the next, with regard to safety overrides and emergency release methods for these doors. Because an interlock could inhibit egress, it is crucial to address the required operation of these doors during an emergency.

A change addressing control vestibules has been approved for the 2027 edition of the I-Codes, and a proposal is in the works for the 2027 edition of NFPA 101 – Life Safety Code. Until these editions are adopted in a given jurisdiction, it will be up to the AHJ to decide how to evaluate a proposed control vestibule. However, the approved section provides some good guidance for these applications and could be used as the basis for a code modification request prior to adoption of the new code.

For the 2027 I-Codes, proposal E61-24 addresses the following requirements:

- Definition: The I-Codes will define a control vestibule as: A space with doors in series that are interlocked such that when one door is open other doors are restricted from opening.
- Use group or occupancy classification, and occupant load: The 2027 I-Codes will permit control vestibules in the means of egress for security, environmental control, or clinical needs in:
    - Groups F (factory industrial), H-3, H-4, H-5 (high hazard), I-1, I-2 (institutional), and S (storage) where the occupant load of the room or space served by the control vestibule is less than 50.
    - Groups B (business) and M (mercantile) where the occupant load of the room or space served by the control vestibule is 10 or less.
- Fire suppression/detection systems: The new section will require the building to either be equipped throughout with an automatic sprinkler system, or for the room or space served by the control vestibule to have an approved automatic smoke detection system. Activation of these systems must deactivate the interlock function of the control vestibule doors, to facilitate immediate egress through the vestibule. This requirement also applies to areas that have an emergency alarm system for hazardous materials.
- Door operation: Doors in control vestibules must swing in the direction of egress travel (exception: power-operated doors in accordance with Section 1010.3.2) and must be equipped with self-closing devices.
- Power failure: As with other special locking arrangements, loss of power must result in the deactivation of the interlock function of the doors in the control vestibule, to allow free egress. Fail safe locks will operate as required by code, as they unlock upon loss of power.
- Egress-side override: If one door in a control vestibule fails to close, it will prevent the operation of the other doors. To address this potential barrier to egress, an override switch is required on the egress side of each door. Operation of the switch must result in direction interruption of power to the electrified locks – independent of the other electronics, and the locks must remain unlocked for at least 30 seconds. An audible alarm could be incorporated to deter use of the override switch in non-emergency conditions, although this is not crucial for life safety and is not required by the code. The code addresses the required location of these override switches.
- Signage: Signage is required with instructions on the use of the interlock override switches, to ensure that building occupants understand how the control vestibule operates under emergency conditions.
- Number of control vestibules: To minimize the effect on egress, the I-Codes will state that the egress path from any point in the building shall not pass through more than one control vestibule.
- UL listings: The model codes require some types of electrified hardware to be listed to UL 294 – Standard for Access Control System Units or to UL 1034 – Standard for Safety for Burglary-Resistant Electric Locking Mechanisms. These listings are typically required when the hardware could affect egress, and electrified locks used in a control vestibule must be listed to one of these standards.

Remember, these considerations are not yet included in the model codes but should be addressed when designing a control vestibule that will be submitted to the AHJ for approval. In some jurisdictions, there may be local code modifications related to this application; it's also possible that a jurisdiction could prohibit control vestibules. Including the new requirements in the 2027 model codes will help to ensure a more consistent approach to these special locking arrangements.

There are many additional changes and clarifications in various stages of the 2027 code development cycle that will affect doors and hardware. To give just a few examples, there are modifications in progress that address delayed egress locks, double egress pairs, a second releasing motion for doors serving individual bedrooms in dormitory suites, as well as individual restrooms. The omission of door closers on fire doors serving assisted living units is still up for discussion, as well as the degree of opening for testing the closing and latching of fire doors. Watch for future Decoded articles addressing these and other changes, and refer to the code publications for complete information.

If you are interested in following the Little Rock Chapter, our links are as follows (*for Facebook and LinkedIn look for the CSI Little Rock Chapter*):

Website: https://csilittlerock.org
Facebook: www.facebook.com
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For Membership Information:
https://www.csiresources.org/communities/membership/individual-membership

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To See what CSI is all about:
https://higherlogicdownload.s3.amazonaws.com/CSIRESOURCES/143a718d-6df6-484a-8a79-76d79635b741/UploadedImages/CSI_ResourcesCatalogFinalLowRes.pdf

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Chapter Info

Chapter Website:	**https://csilittlerock.org**
Chapter Newsletter:	**SpecWork**
Chapter Meeting Day and Time:	**2nd Wednesday of Each Month unless otherwise specified by the Chapter President**
Chapter Board Meeting Day and Time:	**1st Friday of each Month unless otherwise specified by Chapter President**

If you are interested in Joining CSI or if you are just interested in keeping up with the information provided by CSI, See the slides shown from the “Why CSI” presentation