

Connecticut Code Chronicle

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for the use and information of the design and code enforcement communities

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COMPUTER ROOMS

Two new definitions have been introduced in the 2024 International Building Code. We need to be aware of this, and its relationship to the NEC.

[BG] COMPUTER ROOM. A room or portions of a building used primarily to house information technology equipment (ITE) and serving an ITE load less than or equal to 10 kW or 20 W/ft² (215 W/m²) of conditioned floor area.

Pay particular attention to the part specifying the maximum electrical loads for the computer equipment. If the connected load for all of the IT equipment in the room exceeds 10 kW *OR* exceeds 20 W/ft² — the room does not fit the definition of a “Computer Room.” It doesn’t have to exceed both criteria; if the load exceeds either of those two criteria, the room or space does not fall within the definition of a “Computer Room.”

If it’s a room full of computer stuff, but the IT equipment load exceeds the limits for a “Computer Room,” what is it? Answer: It then becomes a Data Center.

[BG] DATA CENTER. A room or building, or portions thereof, used primarily to house information technology equipment (ITE) and serving a total ITE load greater than 10 kW and 20 W/ft² (215 W/m²) of conditioned floor area.

With information technology becoming so ingrained in everything we do today, it’s not at all unusual for small businesses to have office networks for offices, and inter-connected point-of-sale (POS) terminals and inventory control systems for retail establishments. This is an instance of the IBC finally catching up with what has been happening in the real world for a number of years.

Based on these definitions; a computer room is not just any space with servers. The code makes it very specific: it must be a room used primarily to house information technology equipment, and it can only serve an IT equipment load of 10 kW or less, or 20 watts per square foot or less of conditioned floor area.

Think of a small municipal server room: two racks, a switch, and a firewall. The equipment draws 8 kW, and the room is 600 square feet. That works out to about 13 watts per square foot. Both numbers are below the limits. This room is a computer room by definition.

Now, picture a university data center. Rows of blade servers pulling 50 kW in a 1,500 square foot space. That’s about 33 watts per square foot and five times the 10 kW limit. Although it houses IT equipment, it is not considered a computer room as defined by the code. It is a data center or an information technology equipment room, which is subject to different requirements.

Hmmm...

The 2024 IBC added these definitions, but a scan through the index shows that neither term has any code sections addressing it. What’s the point of adding definitions for terms that aren’t used in the code? However, these terms are defined in the 2021 *International Energy Conservation Code*. The IECC provides criteria for energy efficiency of both HVAC equipment and lighting in computer rooms and in data centers. Although the ICC I-Codes generally provide that terms defined in one code apply to the other codes, it’s a lot cleaner to put definitions in any code that may be looked at in regulating some aspect or element of design and construction.

NEC Tie-In

Another, related answer may lie in the NEC. Article 645 of the National Electrical Code has long been a source of debate, mostly because of the way it handles emergency power off requirements in information technology equipment rooms. For years, designers who wanted to avoid installing the big red emergency power off (EPO) button have taken advantage of a specific section that allowed them to “design out” of the rule. The upcoming 2026 NEC keeps the intent of Article 645 but moves some key language and updates the cross references. Anyone who enforces or designs according to this article needs to know exactly what changed and what did not.

What 645.4 said in the 2023 NEC:

In the 2023 edition, Section 645.4 spelled out the trade-off. It permitted alternative wiring methods, shortcuts to the standard Chapter 3 wiring rules and to the signaling and optical fiber wiring rules in Articles 725 and 770, if six specific conditions were met. These conditions required:

- a disconnecting means that it complied with 645.10
- a dedicated HVAC system or a shared system with smoke dampers that close when the disconnect is operated or when smoke is detected
- all ITE and communications equipment in the room to be listed
- the room to be occupied and accessible only to personnel needed for maintenance and operation
- fire resistance separation from other occupancies
- only equipment associated with the operation of the ITE room to be installed inside

The practical effect was simple. If you did not need the alternative wiring allowances and you built the room to fully meet the standard Chapter 3 and Chapter 7 wiring methods, you were not required to follow Article 645 at all. That meant the emergency

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power off in 645.10 did not apply. This “opt out” provision is what allowed many projects to avoid the EPO requirement.

2026 Draft Change

In the 2026 draft, section 645.4 is gone, but the substance is not. The same six conditions will be relocated into section 645.5, with updated references:

- The old references to Chapter 3, Article 725, and Article 770 are replaced with new references to Article 722, specifically 722.120 for signaling wiring and 722.160 for optical fiber cabling.
- The language of the conditions themselves is virtually unchanged.
- The informational notes have been updated to match the latest editions of NFPA 75.

Why It Matters

The reorganization does not change the ability to design out of Article 645. The options in Section 645.4 describe an *alternate* path for design. This alternate path is simply relocated for 2026.. If a designer chooses to build the IT space to standard Chapter 3 wiring methods and does not claim the alternative wiring allowances described in 645.4 (which will become 645.5 with the 2026 NEC), then Article 645 and with it the 645.10 emergency power off requirement does not apply.

However, adding the new definitions to the IBC may not be much help to us, because the NEC doesn’t use those terms. Instead, the NEC uses the term “Information Technology Equipment Room:

Information Technology Equipment (ITE). Equipment and systems rated 600 volts or less, normally found in offices or other business establishments and similar environments classified as ordinary locations, that are used for creation and manipulation of data, voice, video, and similar signals that are not communications equipment as defined in Part I of Article 100 and do not process communications circuits as defined in 800.2.

Information Technology Equipment Room. A room within the information technology equipment area that contains the information technology equipment. [75:3.3.9]

There is a separate NFPA standard, NFPA 75-2013, *Standard for the Protection of Information Technology Equipment*, which covers the requirements for the protection of information technology equipment and information technology equipment areas. Unfortunately, NFPA 75 is not a referenced standard in the 2024 IBC. This means it can be looked at for information and guidance, but it isn’t enforceable, and designers can’t use anything in it that directly conflicts with the IBC and NEC unless they obtain a modification from the State Building Inspector.

But the 2024 IBC adds two additional new definitions that track more closely with the language and definitions in the NEC:

[BG] INFORMATION TECHNOLOGY EQUIPMENT (ITE). Computers, data storage, servers and network communication equipment.

[BG] INFORMATION TECHNOLOGY EQUIPMENT FACILITIES (ITEF). Data centers and computer rooms used primarily to house information technology equipment.

The term Information Technology Equipment (ITE), although new to the IBC, is also imported from previous editions of the *International Energy Conservation Code*.

The bottom line, for building officials, electrical inspectors, electrical contractors, and design professionals is that IT rooms are a “thing,” and the codes are catching up to real life and beginning to regulate what can go in those rooms as well as what protections may be required for them. Expect to see more. Our society is moving rapidly toward Artificial Intelligence (AI), such as ChatGPT and other, similar systems. AI requires exponentially more computer resources than conventional search engines such as Google and Bing. This means that increased reliance on AI will result in more and larger data centers to power the AI systems.

(Shout out to Jeff Remas for input on NEC Article 645)

NEW IBC DEFINITIONS

A number of other definitions in the 2024 IBC have either been revised, or have been added since the 2021 IBC. In addition to those discussed previously in this edition, some other definitions we need to be aware of include:

[BE] AUTOMATIC FLUSH BOLT. Door-locking hardware, installed on the inactive leaf of a pair of doors, which has a bolt that is extended automatically into the door frame or floor when the active leaf is closed after the inactive leaf, and which holds the inactive leaf in a closed position. When the active leaf is opened, the

automatic flush bolt retracts the bolt or rod, allowing the inactive leaf to be opened (see “Constant latching bolt,” “Dead bolt,” “Manual bolt”).

[BE] CONSTANT LATCHING BOLT. Door-locking hardware installed on the inactive leaf of a pair of doors consisting of a bolt that automatically latches into the door frame or floor, holding the inactive leaf in a closed position. The latch bolt is retracted manually to allow the inactive leaf to be opened.

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[BE] DEAD BOLT. Door locking hardware with a bolt that is extended and retracted by action of the lock mechanism (see “Automatic flush bolt,” “Constant latching bolt,” “Manual bolt”).

[BE] MANUAL BOLT. Door-locking hardware operable from one side of the door, or from the edge of a door leaf, with a bolt or rod extended and retracted by manual movement of the bolt or rod, such as a manual flush bolt or manual surface bolt (see “Automatic flush bolt,” “Constant latching bolt,” “Dead bolt”).

These definitions all relate to an article I wrote two years ago, for October 2023, entitled EGRESS DOORS AND LOCKS. In that article I discussed the fact that for most businesses, commercial occupancies, and other buildings open to the public, it is no longer allowable to use an aluminum storefront door with a simple deadbolt and thumbturn if there is any possibility that the door(s) may be locked while there are employees working inside. It was standard practice for many, many years for employees to come in before a business opened to the public, and for the employees to lock themselves in by locking a deadbolt.

That arrangement is no longer allowed, even under the 2021 IBC portion of our 2022 Connecticut State Building Code, under sections 101.2, 101.2.1, and 1010.2.2. This created a problem for stores (and other occupancies) in which the entrance doors were a pair of doors. The typical arrangement we’ve seen for decades is a deadbolt in the active leaf that latches into the face of the stile of the inactive leaf, which in turn is secured by hidden top and bottom flush bolts with the activating “flippers” recessed into the edge of the meeting stile of the inactive leaf.

The deadbolt in the active leaf is bad enough, but the hidden flippers for the concealed flush bolts check all the boxes for hardware that’s not allowed:

- They’re hidden
- They require special knowledge to operate
- There are usually two, so they require more than one operation to unlock
- They require tight grasping, pinching, or twisting of the wrist to operate

Section 1010.2.4, Locks and Latches, provides that “Locks and latches shall be permitted to prevent operation of doors where any of the following exist.” Most of the conditions allowing doors to be locked against egress are special occupancies. However, condition number 4 is hardware-related and not limited to any specific occupancy classification:

“4. Where egress doors are used in pairs, *approved* automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts does not have a doorknob or surface-mounted hardware.”

However, the 2021 IBC (and thus the 2022 CSBC) didn’t include a definition of automatic flush bolt. The new definitions in the 2024 IBC correct that oversight, and provide the definitions needed to properly enforce the intent of section 1010.2. There are hardware solutions available that fully comply with these code requirements (including automatic flush bolts). Don’t let owners or contractors tell you it can’t be done right.

IRC CHANGES

Expect a number of changes when we adopt the 2024 International Residential Code. Some of the changes represent the code catching up with new technology, and other changes are a result of someone thinking the code needed to [better] address some particular issue. Here’s a quick summary of some things to be on the lookout for:

- ❖ Imaginary lot lines are added for calculating fire separation distance when considering multiple dwellings on a single lot
- ❖ Shared accessory rooms are an option in two-family dwellings.
- ❖ Many requirements for energy storage systems are added.
- ❖ New protection requirements for storage batteries in garages are added.
- ❖ Sleeping loft requirements added for habitable attic style lofts and tiny home style lofts now have maximum size limits to meet an exception.
- ❖ Reinforcement of the floor below guards at a mezzanine is now required.
- ❖ The final test of the DWV system may be visual.
- ❖ Air exhaust openings now allowed near operable windows and doors.
- ❖ A2L refrigerants are added as an option for cooling equipment.
- ❖ Solvent cement joints for CPVC pipe are allowed above and below ground.
- ❖ Snow, wind, and seismic maps updated.
- ❖ Accessibility in care facilities clarified.

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FORMAT CHANGES

The 2024 I-Codes will introduce a new, single-column, full page-width format as well as making technical changes. The I-Codes will also introduce the use of scannable QR codes to provide links to additional information. The format changes are supposed to make the I-Codes easier to read and easier to use. My opinion doesn't count, and I'm sure the ICC won't go back to the old format in 2027, but my personal opinion is that the format changes are not an improvement, but just another example of somebody making changes in order to justify their existence.

Like any such visual, format change, this one will require some time for us to adapt to it. It's fundamental to the way our

minds work that over prolonged exposure we become accustomed to seeing things in familiar patterns. When a frequently-used reference document undergoes a significant change in format, the initial result is that it takes readers longer to find things because the appearance of each page is now "different."

Whether you approve or disapprove of the new format, we're going to have to live with it, so buckle up and get ready for the ride when the new codes arrive next year.

HAPPY THANKSGIVING

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The editor is a licensed architect and a licensed building official, with more than 40 years of experience. I offer non-structural plan review services for projects of any size, with special rates for municipal building departments.

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What topics would you like to see discussed in future issues? It helps all of us if we can all be on the same page, to avoid those "But I never have to do that in [town]" complaints.

Send me an e-mail if you think of any issues that affect all building officials, everywhere.