Building Owners and Managers Association International

and the

National Multifamily Housing Council

December 2023

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The 2024 Internatonal Energy Conservaton Code – Commercial (IECC-C) mandates the provision of electrical energy storage systems (ESS) or a reserved area for future installaton of ESS. These

February 15, 2022 memorandum,[12] nonmandatory appendices are informational and not adoptable, meaning such appendices are drafted in nonmandatory language.

[12] https://www.iccsafe.org/wp-content/uploads/IECC-Discount-Rates-and-Code-Content-Memorandum_02_15.22.pdf

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Bryan Holland
Michael Stone
NEMA
1300 17th St N #900,
Arlington, VA 22209, USA
bryan.holland@nema.org
mike.stone@nema.org

Andrew Klein
Building Owners & Managers Associa t on Intl.
1101 15th Street NW
Suite 800
Washington, DC 20005
andrew@asklein.com

Bob Raymer
Leading Builders of Americaymer

CHAPTER 1 [CE] SCOPE AND ADMINISTRATION

User note:

CEPI-7-21

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@ : A8AB+B9C" Kim Cheslak, NBI, NBI (kim@newbuildings.org); Bryan Bomer, Department of Permitting Services, Montgomery County MD, Department of Permitting Services (bryan.bomer@montgomerycountymd.gov); Lauren Urbanek, Natural Resources Defense Council (lurbanek@nrdc.org); Ben Rabe, Fresh Energy (rabe@fresh-energy.org); Kim Burke, State of Colorado, Colorado Energy Office (kim.burke@state.co.us); Howard Calvert Wiig, Hawaii State Energy Office, Hawaii State Energy Office (howard.c.wiig@hawaii.gov); Chris Castro, City of Orlando, City of Orlando (chris.castro@orlando.gov); Brad Smith, City of Fort Collins (brsmith@fcgov.com); Amber Wood, ACbld, cgov_0_0_0_0_0

REPI-8-21

Kim Cheslak, NBI, NBI (kim@newbuildings.org); Lauren Urbanek, Natural Resources Defense Council (lurbanek@nrdc.org); Ben Rabe, Fresh Energy (rabe@fresh-energy.org); Chris Castro, City of Orlando, City of Orlando (chris.castro@orlando.gov); Brad Smith, City of Fort Collins (brsmith@fcgov.com); Amber Wood, ACEEE, ACEEE (awood@aceee.org)

The construction documents shall provide the location of pathways for routing of raceways or cable from the energy storage system area to the electrical service panel and the location and layout of a designated area for electrical energy storage system.

Inspections at electrical rough-in shall verify compliance as required by the code and the approved plans and specifications as to the locations, distribution, and capacity of the electrical system. Where the energy storage system area is not in the same space as the electrical panel, inspections shall verify conduit or pre-wiring from the energy storage ready zone to the electrical panel.

The !" #$ shall have a final inspection and shall not be occupied until %&&'()*". The final inspection shall include verification of the installation of all required !" #$ systems, equipment and controls and their proper operation and the required number of high-efficacy lamps and fixtures.

Each !" #$+, -* shall have a dedicated location for the installation of future on-site energy storage in accordance with this section.

Where an onsite electrical energy system storage system is installed.

One- and two-family dwellings and townhouses shall be provided with an energy storage ready area in accordance with the following:

1. Floor area not less than 2 feet (610 mm) in one dimension and 4 feet (1219 mm) in another dimension and located in accordance with Section 1207 of the International Fire Code and Section 110.26 of the NFPA 70.
2. The main electrical service panel shall have a reserved space to allow installation of a two-pole circuit breaker for future electrical energy storage system installation. This space shall be labeled “For Future Electric Storage.” The reserved spaces shall be positioned at the end of the panel that is opposite from the panel supply conductor connection.

Buildings with Group R-2, R-3 and R-4 occupancies shall comply with Section C405.15.

General	
R401.2.5	Additional efficiency packages
R401.3	Certificate
Building Thermal Envelope	
R402.1.1	Vapor retarder
R402.2.3	Eave baffle
R402.2.4.1	Access hatches and doors
R402.2.10.1	Crawl space wall insulation installation
R402.4.1.1	Installation
R402.4.1.2	Testing
Mechanical	
R403.1	Controls
R403.3 except Sections R403.3.2, R403.3.3 and R403.3.6	Ducts
R403.4	Mechanical system piping insulation
R403.5.1	Heated water calculation and temperature maintenance systems
R403.5.3	Drain water heat recovery units
R403.6	Mechanical ventilation
R403.7	Equipment sizing and efficiency rating
R403.8	Systems serving multiple dwelling units
R403.9	Snow melt and ice systems
R403.10	Energy consumption of pools and spas
R403.11	Portable spas
R403.12	Residential pools and permanent residential spas
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls
R404.4	Energy storage infrastructure
R406.3	Building thermal envelope

a. Reference to a code section includes all of the relative subsections except as indicated in the table.

Energy storage will soon become critical to achieving President Biden's goal of a carbon-free power sector by 2035. These systems could also bolster economy, present a cost savings opportunity for homeowners and increase resilience to power outages. In 2020, 21% of the United State's electricity is sourced from renewable energy, primarily wind, an intermittent source of energy. As the U.S. increases the amount of electricity generated from renewables, buildings must be prepared to aid in this transition by storing energy to match grid demands.

Policies to encourage energy storage will improve the U.S. economy. Energy storage is expected to grow by over 40% each year until 2025 and the U.S., because of its manufacturing background and experience in battery-storage technology for cars is becoming a clear leader in this market.

Energy storage will also present a cost-saving opportunity for homeowners. Battery prices have and will likely continue to fall in the United States, meaning that behind-the-meter storage will likely become more accessible and affordable in the short-term. More and more utilities are moving beyond volunt®wtha

REPI-115-21

Joseph H. Cain, P.E., Solar Energy Industries Association (SEIA), Solar Energy Industries Association (SEIA) (JoeCainPE@gmail.com)

One or more devices, assembled together, capable of oHpU 5Hfd

A minimum of four branch circuits shall be identified and have their source of supply collocated at a single panelboard supplied by the ESS. The following end uses shall be served by the branch circuits:

1.

R403.11	Portable spas
R403.12	Residential pools and permanent residential spas
R404.1	Lighting equipment
R404.2	Interior lighting controls
R404.4	Electrical energy storage system

a. Reference to a code section includes all the relative subsections except as indicated in the table.

General	
R401.2.5	Additional efficiency packages
R401.3	Certificate
Building Thermal Envelope	
R402.1.1	Vapor retarder
R402.2.3	Eave baffle
R402.2.4.1	Access hatches and doors
R402.2.10.1	Crawl space wall insulation installation
R402.4.1.1	Installation
R402.4.1.2	Testing
Mechanical	
R403.1	Controls
R403.3 except Sections R403.3.2, R403.3.3 and R403.3.6	Ducts
R403.4	Mechanical system piping insulation
R403.5.1	Heated water calculation and temperature maintenance systems
R403.5.3	Drain water heat recovery units
R403.6	Mechanical ventilation
R403.7	Equipment sizing and efficiency rating
R403.8	Systems serving multiple dwelling units
R403.9	Snow melt and ice systems

R403.10	Energy consumption of pools and spas
R403.11	Portable spas
R403.12	Residential pools and permanent residential spas
Electrical Power and Lighting Systems	
R404.1	Lighting equipment
R404.2	Interior lighting controls
R404.4	Electrical energy storage
R406.3	Building thermal envelope

a. Reference to a code section includes all of the relative subsections except as indicated in the table.

As deployment of distributed energy resources such as solar photovoltaic systems increases, so does the need for distributed energy storage resources to minimize grid impacts. Solar PV systems are known to be an intermittent power source, with peak power generation at mid-day and reduced power generation in the late afternoon and into early evening. Energy storage systems such as Battery Energy Storage Systems charge during the peak PV generation hours, and begin to discharge in late afternoon and evening as the sun sets. Considering these energy storage systems reduce the backfeed into the grid, they help with grid management, as well as provide a financial buffer for differing net energy metering policies by states and utilities. In an ideal case, a home with PV and ESS can be nearly "invisible" to the grid.

In recent news we have seen extended grid power outages in multiple regions of the U.S. owing to severe environmental events such as fire, wind, hurricanes, and flooding. Many homeowners in regions with a history of recurring grid power outages have acquired gas-powered generators to serve as their backup power source. People need power to keep food from spoiling in refrigerators and freezers, as well as to refrigerate their medicines. Many people need to power medical devices, which can be as common and simple as CPAP machines. And of course, basic communications means a need for charging cell phones and other electronics.

Solar photovoltaic systems paired with battery storage systems can operate to serve these basic needs indefinitely. Stand-alone battery storage systems can serve short-term needs. Manufacturers of electric vehicles are providing more options for connecting vehicle batteries to home electrical systems.

The cost of battery storage systems is declining. As the market expands, the cost will continue to drop. During the years the 2024 IECC will be in effect, it will help to have storage readiness, to provide for reduced cost of ESS installation, and dedicated circuits to direct backup power where it is needed the most.

This proposal is based on the ESS Ready provisions that will appear in California's 2022 Building Energy Efficiency Standards as a mandatory measure. The specific requirements -- and the cost consideration -- have been prepared by the California Energy Commission.

The code change proposal will increase the cost of construction.

The proposed requirements are based on mandatory measures in California Energy Commission's 2022 Building Energy Efficiency Standards. The goal of the CEC was an estimated cost for ESS readiness of no more than about $200 to $250 per home, which will vary by location and builder. For any homes that have ESS installed in the future, ESS readiness will save more money at the time of installation than money spent in the cost of readiness.

Join now!

Solar battery incentives and rebates

- State level solar battery
- Additional storage

Maryland

Maryland is one of the

those that need it most

Massachusetts

Massachusetts offers a storage adder under the commonwealth's

pays you based on solar production, but we're not complaining.)

New York

While the state of New York

Bylaws for the International Code Council, Inc.
A Delaware Nonprofit Nonstock Corporation
Effective December 10, 2021

ARTICLE I — NAME AND OBJECTIVES

1.1 Name - This organization shall be known as the International Code Council, Inc., hereinafter in these Bylaws referred to as the "Council" or the "Corporation".

Corporation shall not engage in a regular business activ
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[redacted]

ARTICLE IV —GEOGRAPHICAL REPRESENTATION

4.1 Limitations - To encourage wide geographical representation, no more than two Governmental Member Voting Representatives designated by Governmental Members located in the same state may serve simultaneously on any one committee nor may more than two Governmental Member Voting Representatives designated by Governmental Members located in the same state serve simultaneously on the Board of Directors.

4.2 Distribution - To provide for geographical representation on the Board of Directors, the following sections are established:

Table 4.2	
Section A	Alaska, British Columbia, Washington, Oregon, California, Nevada Hawaii
Section B	Idaho, Montana, Wyoming, North Dakota, South Dakota, Minnesota, Iowa, Wisconsin, Alberta, Saskatchewan, Manitoba
Section C	Utah, Arizona, Colorado, New Mexico, Oklahoma, Texas, Arkansas, Mexico
Section D	Nebraska, Kansas, Missouri, Illinois, Michigan, Indiana, Ohio, Kentucky, Ontario

5.3 Removal of a Director - Any director may be removed from office upon the affirmative vote of two-thirds of the Voting Members present and voting at a duly held meeting of the members at which a quorum is present.

5.4 Election - Except as provided herein, the Board of Directors shall establish policies governing the conduct of elections and copies thereof shall be provided to any member requesting a copy. At each Annual Business Meeting a majority of the Voting Members present and voting shall elect such number of directors as necessary to fill vacancies of directors whose terms expire as of such meeting.

5.5 Quorum - At all meetings of the Board of Directors, two-thirds of the voting directors then in office

of the Board of Directors. The membership shall be notified, within ten days after the Board of Directors' official action, of any emergency amendment. At the next Annual Business Meeting any emergency

shall meet as necessary, between meetings of the Board of Directors, at a date and place designated by

trust) by reason of the fact that such person is or was an agent of the Corporation, against expenses,

In the event of any inconsistencies between this Article XIV and any other provisions regarding indemnification of Directors and Officers by the Corporation, this Article XIV shall prevail. Nothing contained in this Article XIV shall affect any right to indemnification held by persons other than Directors and Officers.

14.8 Forms of Indemnification Not Permitted - No indemnification or advance shall be made under this Article XIV, except as provided in Section 14.4 or 14.5(b), in any circumstances where it appears:

(a) That it would be inconsistent with a provision of the Certificate of Incorporation, these Bylaws, or an agreement in effect at the time of the accrual of the alleged cause of action asserted in the proceeding in which the expe.9(w)-1-4.5(on o71.6(h)-5.96.2ng)-5.(h)-5.8(i)

ARTICLE XVI — DISSOLUTION

In the event of a dissolution or final liquidation of the Council, all of the remaining assets and property of the Council shall, after paying or making provision for the payment of all of the liabilities or obligations of

Tools in the Arcade Following Her Lead

Sports Illustrated

Paul Emrath, National Association of Home Builders (NAHB)
Caitlin Sugrue Walter, National Multifamily Housing Council (NMHC)

About NAHB

The National Association of Home Builders (NAHB) strives to protect the American Dream of housing opportunities for all, while working to achieve professional success for its members who build communities, create jobs and strengthen our economy. NAHB Multifamily provides services, benefits and opportunities to members with an interest in multifamily housing, including multifamily member meetings, newsletters, events, webinars and multifamily housing awards. It coordinates with other NAHB departments on advocacy e orts, economic studies and resources for multifamily housing. For more information, please visit NAHB Multifamily at nahb.org/nahb-community/councils/multifamily-council.

About NMHC

Based in Washington, D.C., the National Multifamily Housing Council (NMHC) is the leadership of the apartment industry. We bring together the prominent owners, managers and developers who help create thriving communities by providing apartment homes for 40 million Americans, contributing $3.4 trillion annually to the economy. NMHC provides a forum for insight, advocacy and action that enables both members and the communities they help build to thrive. For more information, contact NMHC at 202/974-2300, e-mail the Council at info@nmhc.org, or visit NMHC's website at nmhc.org.

Perhaps more importantly, some of these regulatory mandates can discourage developers from building in the very marketplaces that have the greatest need for more housing. This can prove to be particularly burdensome in a world of rising costs. For example, 47.9 percent of multifamily developers said they avoid building in jurisdictions with policies such as inclusionary zoning, and a full 87.5 percent will avoid building in a jurisdiction with rent control in place.

There are also significant obstacles to development at the community level that are unrelated to governmental regulation. For instance, our research shows that "Not in My Backyard" (NIMBY) opposition to multifamily development adds an average of **5.6 percent to total development costs** and delays the delivery of new housing by an average of **7.4 months**. While most Americans agree that we need more housing and more housing a□ordable to middle-income households, too many change their opinion when someone proposes to put that new housing in their neighborhood. The intensity of opposition is escalated if that housing is rental housing.

About the Research

NAHB and NMHC distributed an identical survey in April 2022 to their respective memberships to access a wide range of development scales across the United States. The primary purpose was to quantify how much regulation exists for developers to contend with and how much that regulation is adding to the cost of developing new multifamily properties.

Some of these questions quantify the impact of regulations, such as inclusionary zoning and rent control, that not only may directly increase the costs of projects that are built but a□ect the supply and cost of housing in the community by causing some projects not to be built at all. An additional set of questions asked about the financial impact of NIMBYism, an issue that has been widely identified as one of the major cost drivers impacting a□ordability but where little quantifiable data currently exists.

A total of 49 usable responses were received. The responses from the survey were combined with existing public data and other survey collections to calculate the financial cost as a percent of total development cost for each regulation. A detailed description of the assumptions used in the calculations can be found in Appendix 1.

Total Cost of Regulations

Regulatory costs that exist during the multifamily development process can be divided into several categories. Table 1 shows the share of developer respondents subject to these various regulations and the average cost of each category as a percentage of the total development cost.

1

The last column of the table shows

1. A C D

		Average When Present*	Average Across All Properties
	. %	. %	. %
	. %	. %	. %
	. %	. %	. %
	. %	. %	. %
	. %	. %	. %
	. %	. %	. %
	. %	. %	. %
	. %	. %	. %
	. %	. %	. %
TOTAL COST OF REGULATION	100.0%	40.6%	

* The base is different for every percentage in this column, so the line items are not a

Source: NAHB and NMHC

As Table 1 indicates, the highest average regulatory cost is the result of changes to building codes over the past 10 years (11.1 percent of total development costs). The second highest are the costs imposed when site work begins (8.7 percent). The lowest average cost impact was the pure financial cost of delay, consisting of 0.5 percent when present, lower than the average cost of complying with Occupational Safety and Health Administration (OSHA) or other labor regulations (2.7 percent when present).

The first significant interaction between a multifamily developer and the government typically occurs when the developer applies for zoning approval to allow multifamily housing to be built on a particular parcel of land. Regulatory costs at this stage can vary from costs associated with fees owed to the local jurisdiction for proceeding through the approval process to market or environmental impact studies that must be commissioned from private consultants.

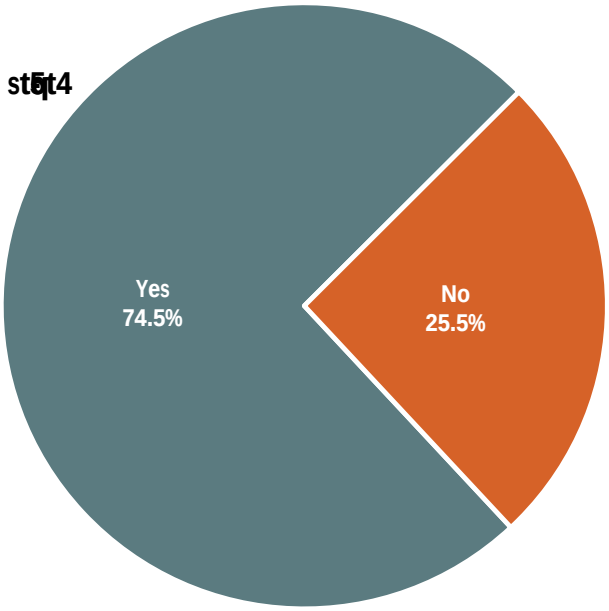
In some cases, a developer can acquire land that allows for multifamily structures to be built on it without requiring rezoning or a special exemption. However, this is rare, with 93.9 percent of the respondents indicating that they must dedicate resources to rezone the land to allow multifamily construction. When they exist, these costs average 3.4 percent of the total development cost.

Once site work begins, local jurisdictions often require a variety of fees or other studies. Examples of fees could include impact fees (fees charged only on a new development to be used for capital improvements) or utility impact fees. Almost all respondents (98.0 percent) reported paying some of these costs in their typical project, representing an average of 8.7 percent of total development costs when present.

Regulation: 40.6 Percent of the Cost of a Multifamily Development

average of 7.4 months.

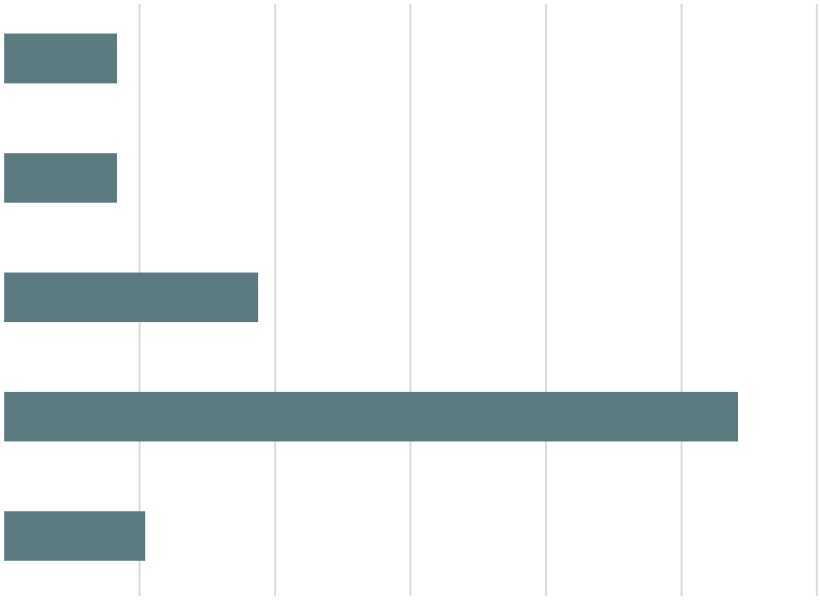
F 4. D E C ?( )



Respondent Profile

A total of 49 usable responses were received from multifamily developers, with a slightly higher concentration of NAHB members than NMHC members (and no duplicates). In one instance, two survey responses were accepted from one

F 6. A ' ( )



Source: NAHB and NMHC

The typical total development cost varied as well but was slightly more evenly distributed (Figure 7). The average total development cost of respondents for a typical project was $53.6 million. Barely over one-third (37.6 percent) reported a typical development cost of $50 to $99.99 million. Small and large projects were equally represented, with 17.8 percent of respondents reporting a cost of less than $10 million and 15.6 percent indicating the typical project costs at least $100 million.

F 7. D C ' ( )

Average:
$56.6 Million

Source: NAHB and NMHC

Appendix 1: Assumptions Used in the Calculations

To calculate a final effect on development costs, many of the NAHB-NMHC survey responses need to be combined with additional information. Primarily these are assumptions about the terms of development and construction loans, how long construction typically takes, and how to allocate costs to different stages of the development and construction process. This appendix lists all the assumptions used in the calculations and gives the sources for each.

1.1 point charged for all land acquisition, development, and construction (AD&C) loans, based on results from a Quarterly Finance Survey (QFS) that NAHB was conducting in the early to mid-2000s.

A 7.65 percent interest rate on all AD&C loans. The QFS indicates that rates are typically set one point above prime, and 6.65 percent is NAHB's estimate of the prime rate that would prevail in the long run under neutral Federal Reserve policy.

The estimates also assume that three-fourths of any category of costs are financed, based on typical AD&C loan-to-value ratios in the QFS.

c

The source for information lags not directly collected in the NAHB-NMHC questionnaire is the Survey of Construction, conducted by the Census Bureau and partially funded by the Department of Housing and Urban Development.

Preliminary estimates are taken from the published annual tables, averaged over the 2001-2016 period:
Authorization to start = 1.71 months
Start to completion = 10.87 months

If the project is 5-9 units
- Authorization to start = 1.95 months
- Start to completion = 11.64 months

If the project is 10+ units
- Authorization to start = 1.94 months
- Start to completion = 13.21 months

The NAHB-NMHC survey collected data on how much time regulation adds to the development process. To assign this to a particular phase of the development, the following assumptions are used.

The regulatory delay is split and attributed half to the lag between applying for zoning approval and the beginning of site work and half to the period after site work begins. If half of the regulatory delay exceeds the lag between applying for approval and the beginning of site work, the excess is also attributed to the period after site work begins.

It is first assumed that the resulting regulatory delay is attributable to the period between the start of site work and the start of building construction, minus three months (the assumed minimum time it would take to do site work in the absence

of regulation, based on conversations with developers). If any regulatory delay remains after being allocated to the zoning approval and site work periods, it is then attributed to the building construction period, and the start-to-completion lag is adjusted upward beyond the SOC-based average, accordingly.

The analysis assumes all loans are paid o when the buildings are completed.

C B

To implement the process described in the paragraph above and calculate a "pure" cost of delay (i.e., the e ect regulatory delay would have even if the regulation imposed no other cost), estimates of costs incurred during di erent phases of the development process are needed.

The breakdown is based on the split between lot and construction costs in NAHB's Construction Cost Surveys (averaged

7. **(, , , .) %**
? *(Please enter "0" if the jurisdiction's requirements don't go beyond what you would normally do.)*

_____%

8. **, 1.6 ((( )-1.1 (2)-2.8 (,)2 ( )-1.1 ( )-2.6 ( )6.8 ( )2.4 ( )10.9 ( )-1**

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_____

_____

15. **10** **,**

% **?** *(Please enter "0" if code changes have had minimal impact on costs).*

_____%

- o Please select if you have not been in operation for the past 10 years

16. **A** **,** **%** **?**

(Please enter "0" if labor regulations have no impact on development costs).

_____%

17. **?**

- o Yes
- o No

18. **,**

% **?**

_____%

19. **,** **(** **)** **k**

?

_____months

20. C **:**

International Code Council
Central Regional Office

:

The scope and intent of ICC codes and standards are set by the Board of Directors in accordance with Council Policy 28. The Board has not previously provided updates or clarification to the scope or intent of codes or standards during an active development process, allowing the development process to proceed to resolution. If a topic is contained in the scope or intent statement, it may be included either in the base of the code or as an appendix, as determined by the consensus body. Generally, appendices in the I-Codes fall under one of two categories: available for state/local adoption and for informational purposes only. In both cases, they undergo the rigors of the process no differently than text considered for the minimum requirements in the code. Each appendix in the respective I-Code notes the specific application of the appendix.