EXPLORATORY COMMITTEE FOR CODE UPDATES' ADMINISTRATIVE RULEMAKING PRIORITIES & RECOMMENDATIONS

Report of the Indiana Fire Prevention and Building Safety Commission's Exploratory Committee for Code Updates' Priorities and Recommendations for New Administrative Rulemaking Promulgations of the Commission's Rules (Title 675 of the Indiana Administrative Code)

Presented to the Indiana Fire Prevention and Building Safety Commission at its Tuesday, December 7, 2021 meeting

OVERVIEW

At its Tuesday, December 1, 2020 and Tuesday, January 5, 2021 meetings, the Indiana Fire Prevention and Building Safety Commission (the Commission) formed an exploratory subcommittee – the Exploratory Committee for Code Updates (the Committee) – and tasked it with reviewing the existing statewide building and fire safety code adopted by the Commission under Title 675 of the Indiana Administrative Code (675 IAC) and recommending a plan forward for updating the existing codes through new administrative rulemaking promulgations under the requirements of the Indiana Administrative Rules and Procedures Act (*see* Indiana Code § 4-22-2). The Committee conducted six (6) meetings between February and November, 2021. Pursuant to the Committee's bylaws, the Committee's review was limited to the following existing building and fire safety codes:

- the 2014 Indiana Building Code (675 IAC 13-2.6)
- the 2020 Indiana Residential Code (675 IAC 14-4.4)
- the 2012 Indiana Plumbing Code (675 IAC 16-1.4)
- the Indiana Electrical Code, 2009 Edition (675 IAC 17-1.8)
- the 2014 Indiana Mechanical Code (675 IAC 18-1.6)
- the 2010 Indiana Energy Conservation Code (675 IAC 19-4)
- the Swimming Pool Code (675 IAC 20)
- the 2014 Indiana Fire Code (675 IAC 22-2.5)
- the 2014 Indiana Fuel Gas Code (675 IAC 25-3)
- the National Fire Protection Association (NFPA) Standards (675 IAC 28-1)

In review of the existing building and fire safety codes listed above and pursuant to the "Duties of the Committee" provided in its bylaws, the Committee now provides the Commission this report of the Committee's priorities and recommendations for updating the existing codes through new administrative rulemaking promulgations, and the reasons why the existing codes must be updated to the latest editions of the national mode codes.

THE COMMISSION'S MOST RECENT RULEMAKING ACTIONS ON THE CODES

To identify which code or codes are most immediately in need of being updated through new administrative rulemaking promulgations, the Committee reviewed the history and most recent rulemaking actions taken by the Commission on each code. Limited to the scope of only the codes listed above, the following table identifies when the Commission took its most recent actions on each code (i.e., when the code/comprehensive rule first became effective, when the Commission last amended or repealed any provisions of the code/comprehensive rule (if at all), and when the Commission last readopted the code/comprehensive rule pursuant to the requirements of Indiana Code § 4-22-2.5):

Indiana Administrative Code (IAC) Citation	Title in Indiana Administrative Code (IAC)	Model Code Edition Adopted by Reference	Effective Date (as originally published and later amended) and Most Recent Readoption Date (if any)
675 IAC 13-2.6	2014 Indiana Building Code	International Building Code, 2012 Edition, First Printing dated May 2011; A117.1 Accessible and Usable Buildings and Facilities, 2009 Edition, First Printing	Effective: 12/1/2014 Readoption File Date: 8/6/2020
675 IAC 14-4.4	2020 Indiana Residential Code	2018 International Residential Code for One- and Two- Family Dwellings, First Printing (August 2017)	Effective: 12/26/2019
675 IAC 16-1.4	2012 Indiana Plumbing Code	International Plumbing Code, 2006 Edition, Second Printing	Effective: 12/24/2012 Readoption File Date: 7/3/2018
675 IAC 17-1.8	Indiana Electrical Code, 2009 Edition	NFPA 70 – National Electrical Code, 2008 Edition, First Printing	Effective: 8/26/2009 Readoption File Date: 7/17/2015
675 IAC 18-1.6	2014 Indiana Mechanical Code	International Mechanical Code, 2012 Edition, First Printing (April 2011)	Effective: 12/1/2014 Readoption File Date: 8/6/2020
675 IAC 19-4	2010 Indiana Energy Conservation Code	ANSI/ASHRAE 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings, 2007 Edition, I-P Edition	Effective: 5/6/2010 Readoption File Date: 10/31/2017
675 IAC 20-1.1	Indiana Swimming Pool, Spa and Water Attraction Code, Third Edition, Rule 1.1 – General Provisions and Definitions	N/A	Effective: 9/1/1989; Amended: effective 4/24/2011; Readoption File Date: 7/2/2019
675 IAC 20-2	Indiana Swimming Pool, Spa and Water Attraction Code, Third Edition, Rule 2 – Public Swimming Pools	N/A	Effective: 9/1/1989; Amended: effective 12/26/2002; Amended: effective 4/24/2011 Readoption File Date: 7/2/2019
675 IAC 20-3	Indiana Swimming Pool, Spa and Water Attraction Code,	N/A	Effective: 9/1/1989; Amended: effective 12/26/2002; Amended:

	Third Edition, Rule 3 – Public Spas		effective 4/24/2011; Readoption File Date: 7/2/2019
675 IAC 20-4	Indiana Swimming Pool, Spa and Water Attraction Code, Third Edition, Rule 4 – Residential Swimming Pools (REPEALED)	N/A	Effective: 9/1/1989; Repealed: filed 3/25/2011, effective 4/24/2011; Moved to 675 IAC 14 – Indiana Residential Code, effective 4/24/2011, now Section R326 of the 2020 Indiana Residential Code (675 IAC 14-4.4)
675 IAC 20-5	Indiana Swimming Pool, Spa and Water Attraction Code, Third Edition, Rule 5 – Water Attractions	N/A	Effective: 4/24/2011; Readoption File Date: 7/2/2019
675 IAC 22-2.2-22	NFPA 386 – Standard for Portable Shipping Tanks for Flammable and Combustible Liquids	NFPA 386 – Standard for Portable Shipping Tanks for Flammable and Combustible Liquids, 1990 Edition	Effective: 8/7/2010 Readoption File Date: 10/11/2016
675 IAC 22-2.2-26	NFPA 1126 – Use of Pyrotechnics before a Proximate Audience	NFPA 1126 – Standard for the Use of Pyrotechnics before a Proximate Audience, 2001 Edition	Effective: 10/21/2005 Readoption File Date: 8/4/2011 and 3/10/2017
675 IAC 22-2.5	2014 Indiana Fire Code	International Fire Code, 2012 Edition, First Printing dated May 2011	Effective: 12/1/2014 Readoption File Date: 8/6/2020
N/A	2014 Indiana Fire Code, Section 913	NFPA 20 – Installation of Stationary Pumps for Fire Protection, 2010 Edition	Effective: 12/1/2014 Readoption File Date: 8/6/2020
675 IAC 25-3	2014 Indiana Fuel Gas Code	International Fuel Gas Code, 2012 Edition, Second Printing dated February 2012	Effective: 12/1/2014 Readoption File Date: 8/6/2020
675 IAC 28-1-2	NFPA 10; Standard for Portable Fire Extinguishers	NFPA 10 – Standard for Portable Fire Extinguishers, 2010 Edition	Effective: 9/22/2006; Amended: effective 12/15/2012; Readoption File Date: 7/3/2018
675 IAC 28-1-3	NFPA 11 – Standard for Low-, Medium-, and High-Expansion Foam	NFPA 11 – Standard for Low-, Medium-, and High-Expansion Foam, 2005 Edition	Effective: 9/22/2006; Readoption File Date: 7/3/2018

675 IAC 28-1-4	NFPA 12 – Standard on Carbon Dioxide Extinguishing Systems,	NFPA 12 – Standard on Carbon Dioxide Extinguishing Systems, 2005 Edition	Effective: 9/22/2006 Readoption File Date: 7/3/2018
675 IAC 28-1-5	NFPA 13 – Standard for the Installation of Sprinkler Systems	NFPA 13 – Standard for the Installation of Sprinkler Systems, 2010 Edition	Effective: 9/27/2012; Readoption File Date: 7/3/2018
675 IAC 28-1-6	NFPA 13R – Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height	NFPA 13R – Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height, 2010 Edition	Effective: 9/27/2012; Readoption File Date: 7/3/2018
675 IAC 28-1-7	RESERVED	N/A	N/A
675 IAC 28-1-8	NFPA 15 – Standard for Water Spray Fixed Systems for Fire Protection	NFPA 15 – Standard for Water Spray Fixed Systems for Fire Protection, 2001 Edition	Effective: 9/22/2006; Readoption File Date: 7/3/2018
675 IAC 28-1-9	NFPA 17 – Standard for Dry Chemical Extinguishing Systems	NFPA 17 – Standard for Dry Chemical Extinguishing Systems, 2002 Edition	Effective: 9/22/2006; Readoption File Date: 7/3/2018
675 IAC 28-1-10	NFPA 17A – Standard for Wet Chemical Extinguishing Systems	NFPA 17A – Standard for Wet Chemical Extinguishing Systems, 2002 Edition	Effective: 9/22/2006; Readoption File Date: 7/3/2018
675 IAC 28-1-11	RESERVED	N/A	N/A
675 IAC 28-1-12	NFPA 25 – Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems	NFPA 25 – Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, 2011 Edition	Effective 5/12/2013; Readoption File Date: 7/3/2018
675 IAC 28-1-13	NFPA 33 – Standard for Spray Application Using Flammable and Combustible Materials	NFPA 33 – Standard for Spray Application Using Flammable and Combustible Materials, 2003 Edition	Effective: 9/22/2006; Readoption File Date: 7/3/2018
675 IAC 28-1-14	NFPA 34 – Standard for Dipping, Coating, and Printing	NFPA 34 – Standard for Dipping, Coating, and Printing Processes Using	REPEALED, filed 11/15/2012, effective 12/15/2012

	Processes Using Flammable or Combustible Liquids (REPEALED)	Flammable or Combustible Liquids, 2003 Edition	
675 IAC 28-1-15	NFPA 37 – Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines	NFPA 37 – Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, 2002 Edition	Effective: 9/22/2006; Readoption File Date: 7/3/2018
675 IAC 28-1-16	NFPA 50 – Standard for Bulk Oxygen Systems at Consumer Sites	NFPA 50 – Standard for Bulk Oxygen Systems at Consumer Sites, 2001 Edition	Effective: 9/22/2006; Readoption File Date: 7/3/2018
675 IAC 28-1-17	NFPA 50B – Standard for Liquefied Hydrogen Systems at Consumer Sites	NFPA 50B – Standard for Liquefied Hydrogen Systems at Consumer Sites, 1999 Edition	Effective: 9/22/2006; Readoption File Date: 7/3/2018
675 IAC 28-1-18	NFPA 51 – Standard for the Design and Installation of Oxygen-Fuel Gas System for Welding, Cutting and Allied Processes	NFPA 51 – Standard for the Design and Installation of Oxygen-Fuel Gas System for Welding, Cutting and Allied Processes, 2002 Edition	Effective: 9/22/2006; Readoption File Date: 7/3/2018
675 IAC 28-1-19	RESERVED	N/A	N/A
675 IAC 28-1-20	NFPA 51B – Standard for Fire Prevention During Welding, Cutting, and Other Hot Work	NFPA 51B – Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, 2003 Edition	REPEALED, filed 11/15/2012, effective 12/15/2012
675 IAC 28-1-21	NFPA 52 – Compressed Natural Gas (CNG) Vehicular Fuel Systems Code	NFPA 52 – Compressed Natural Gas (CNG) Vehicular Fuel Systems Code, 2002 Edition	Effective: 9/22/2006; Readoption File Date: 7/3/2018
675 IAC 28-1-22	NFPA 58 – Liquefied Petroleum Gas Code (REPEALED)	NFPA 58 – Liquefied Petroleum Gas Code, 2011 Edition	Effective: 6/16/2008; Repealed: filed 2/21/2014, effective 3/23/2014* *See Chapter 61 of 2014 Indiana Fire Code (675 IAC 22-2.5-41), which adopts NFPA 58 –

			Liquefied Petroleum Gas Code, 2011 Edition
675 IAC 28-1-23	NFPA 59 – Utility LP-Gas Plant Code	NFPA 59 – Utility LP-Gas Plant Code, 2004 Edition	Effective: 9/22/2006; Readoption File Date: 7/3/2018
675 IAC 28-1-24	NFPA 59A – Standard for the Production, Storage and Handling of Liquefied Natural Gas (LNG)	NFPA 59A – Standard for the Production, Storage and Handling of Liquefied Natural Gas (LNG), 2001 Edition	Effective: 9/22/2006; Readoption File Date: 7/3/2018
675 IAC 28-1-25	RESERVED	N/A	N/A
675 IAC 28-1-26	RESERVED	N/A	N/A
675 IAC 28-1-27	RESERVED	N/A	N/A
675 IAC 28-1-28	NFPA 72 - National Fire Alarm and Signaling Code	NFPA 72 - National Fire Alarm and Signaling Code, 2010 Edition	Effective: 9/22/2006; Amended: effective 3/23/2014; Errata: filed 11/7/2014, effective 12/22/2014; Readoption File Date: 7/3/2018
675 IAC 28-1-29	RESERVED	N/A	N/A
675 IAC 28-1-30	NFPA 82 – Standard on Incinerators, Waste and Linen Handling Systems and Equipment	NFPA 82 – Standard on Incinerators, Waste and Linen Handling Systems and Equipment, 2004 Edition	Effective: 9/22/2006; Readoption File Date: 7/3/2018
675 IAC 28-1-31	NFPA 86 – Standard for Ovens and Furnaces	NFPA 86 – Standard for Ovens and Furnaces, 2003 Edition	Effective: 9/22/2006; Readoption File Date: 7/3/2018
675 IAC 28-1-32	RESERVED	N/A	N/A
675 IAC 28-1-33	RESERVED	N/A	N/A
675 IAC 28-1-34	NFPA 385 – Standard for Tank Vehicles for Flammable and Combustible Liquids	NFPA 385 – Standard for Tank Vehicles for Flammable and Combustible Liquids, 2000 Edition	Effective: 9/22/2006; Readoption File Date: 7/3/2018
675 IAC 28-1-35	RESERVED	N/A	N/A

675 IAC 28-1-36	NFPA 407 – Standard for Aircraft Fuel Servicing	NFPA 407 – Standard for Aircraft Fuel Servicing, 2001 Edition	Effective: 9/22/2006; Readoption File Date: 7/3/2018
675 IAC 28-1-37	RESERVED	N/A	N/A
675 IAC 28-1-38	NFPA 704 – Standard System for the Identification of the Fire Hazards of Materials for Emergency Response	NFPA 704 – Standard System for the Identification of the Fire Hazards of Materials for Emergency Response, 2001 Edition	Effective: 9/22/2006; Readoption File Date: 7/3/2018
675 IAC 28-1-39	NFPA 1123 – Code for Fireworks Display	NFPA 1123 – Code for Fireworks Display, 2006 Edition	Effective: 9/22/2006; Amended: effective 6/16/2008; Errata: filed 7/3/2013, effective 8/17/2013; Readoption File Date: 7/3/2018
675 IAC 28-1-40	NFPA 2001 – Standard on Clean Agent Fire Extinguishing Systems	NFPA 2001 – Standard on Clean Agent Fire Extinguishing Systems, 2004 Edition	Effective: 9/22/2006; Readoption File Date: 7/3/2018

THE COMMITTEE'S PRIORITY RECOMMENDATIONS FOR UPDATING THE COMMISSION'S RULES

Based on its review of the information provided above and based on its consideration of received public comments concerning the codes (the Commission's rules), the Committee took official action at its Thursday, June 10, 2021, meeting to establish its priorities for updating the codes. **The Committee recommends that the Commission should update the codes through new administrative rulemaking promulgations in the following order:**

Top Priority:

- Update the Indiana Electrical Code to the most recent edition of the national model code (NFPA 70 – National Electrical Code).

Next Priorities:

- Update the family of core codes to the most recent editions of the national model codes in one comprehensive code update/rule promulgation:
    - International Building Code
        - Updating to the most recent edition of the International Building Code will also include review of the International Existing Building Code [in replacement of Chapter of 34 of the currently adopted building code (675 IAC 13-2.6 – 2014 Indiana Building Code)].
    - International Fire Code
    - International Fuel Gas Code
    - International Mechanical Code
    - International Plumbing Code
- Repeal the National Fire Protection (NFPA) Standards and amendments in 675 IAC 28 when the family of core codes are updated to the most recent editions of the national model codes.
- Update the Indiana Energy Conservation Code to the most recent edition of either ANSI/ASHRAE 90.1 or the International Energy Conservation Code.

Low Priorities:

- Updating the Swimming Pool Code under 675 IAC 20.
- Updating the Indiana Residential Code under 675 IAC 14.

REASONS FOR UPDATING THE COMMISSION'S RULES

As provided in the Committee's bylaws, this report is required to identify the reasons why the codes recommended to be updated must be updated, and the reasons shall address the following:

(1) Significant differences between the Commission's existing rule and the most recent edition of the model code being recommended to be adopted.
(2) Specific issues the update of the code is designed to address (why the update is needed).
(3) Benefits of updating the rule (direct and indirect).
(4) Whether the net effect of adopting the code will result in additional regulation or reduced regulation.
(5) The expected fiscal impact of updating the code.
(6) Any health or safety concerns being addressed by the rule.

To accomplish this task, the Committee worked in conjunction with volunteer industry stakeholders and subject matter experts to analyze and compare the Commission's currently adopted codes to the latest editions of the national model codes. These volunteers developed supplemental reports based on their analyses of each code within the scope of the Committee's review, and their supplemental reports were presented to the Committee at its meeting on Tuesday, September 28, 2021.

IMPORTANT NOTE: The Commission is advised that the analyses conducted, and the supplemental reports developed from the analyses, were intended to be "high-level overviews" in nature. More in-depth analyses will be performed if and when the Commission appoints subcommittees to review the latest editions of the national model code standards that will be adopted by reference in any rule promulgations.

For simplicity and the general organization of this report, these supplemental reports are incorporated as exhibits at the end of this report. In the few instances in which the Committee does not necessarily recommend updating a code or recommends some other action, a general description of the Committee's assessment of the code is provided below.

675 IAC 13 – Indiana Building Code (*See* "EXHIBIT A1" and "EXHIBIT A2" below)

Comparison: 2014 Indiana Building Code (2012 International Building Code adopted by reference) to the 2021 International Building Code

Prepared by: **EXHIBIT A1 –** John Hawkins; Kovert Hawkins Architects, AIA Indiana
EXHIBIT A2 – Noah Fehrenbacher; WJE Indianapolis, Indiana Structural Engineers Association

IMPORTANT NOTE: In "Exhibit A1," the "Expected fiscal impact" estimates are color-coded to indicate an anticipated reduction in construction costs (savings) or an anticipated increase in construction costs. Figures in "**red**" indicate an anticipated reduction in construction costs (savings). Figures in "**black**" indicate an anticipated increase in construction costs.

675 IAC 14 – Indiana Residential Code (*See* "EXHIBIT B" below)

Comparison: 2020 Indiana Residential Code (2018 International Residential Code adopted by reference) to the 2021 International Residential Code

Prepared by: Christina Collester; RTM Consultants, Inc.

As stated above under "The Committee's Priority Recommendations for Updating the Commission's Rules," the Committee determined that updating the current Indiana Residential Code should be a "low priority" for the Commission. As provided in the table above under "The Commission's Most Recent Rulemaking Actions on the Codes," the current Indiana Residential Code is the 2020 Indiana Residential Code (675 IAC 14-4.4). The 2020 Indiana Residential Code adopts the 2018 International Residential Code, First Printing by reference with the amendments provided in 675 IAC 14-4.4. The 2020 Indiana Residential Code became effective on December 26, 2019.

Given that the 2020 Indiana Residential Code has been an effective code for nearly two years, the Committee encourages the Commission to assess the impact that the 2020 Indiana Residential Code has had on the state of Indiana's industries and the regulated public and determine if rulemaking may be necessary to resolve any perceived issues. Any rulemaking to the 2020 Indiana Residential Code is unlikely to be significant in nature, and the Commission should be able complete any rulemaking(s) itself with the support of its staff.

"Exhibit B," provided below, provides an overview of the items that were added to the 2021 International Residential Code that were not included in the 2018 International Residential Code. As provided in the exhibit, none of the additions warrant a comprehensive rulemaking update to the Indiana Residential Code at this time.

675 IAC 16 – Indiana Plumbing Code (*See* "EXHIBIT C" below)

Comparison: 2012 Indiana Plumbing Code (2006 International Plumbing Code adopted by reference) to the 2021 International Plumbing Code

Prepared by: Brenda Dant; Indiana PHCC Association

675 IAC 17 – Indiana Electrical Code (*See* "EXHIBIT D" below)

Comparison: Indiana Electrical Code, 2009 Edition (NFPA 70 – National Electrical Code, 2008 Edition adopted by reference) to NFPA 70 – National Electrical Code, 2020 Edition

Prepared by: Tim McClintock; National Electrical Manufacturers Association

675 IAC 18 – Indiana Mechanical Code (*See* "EXHIBIT E" below)

Comparison: 2014 Indiana Mechanical Code (2012 International Mechanical Code adopted by reference) to the 2021 International Mechanical Code

Prepared by: Brenda Dant; Indiana PHCC Association

675 IAC 19 – Indiana Energy Conservation Code (*See* "EXHIBIT F" below)

Comparison: 2010 Indiana Energy Conservation Code (ANSI/ASHRAE 90.1 – Energy Standard for Buildings Except Low-Rise Residential Buildings, I-P Edition, 2007 Edition adopted by reference) to ANSI/ASHRAE 90.1 – Energy Standard for Buildings Except Low-Rise Residential Buildings, I-P Edition, 2019 Edition and the 2021 International Energy Conservation Code

Prepared by: Dan Overbey; Browning Day Mullins Dierdorf, Ball State University, AIA Indiana
Joe Yount; RATIO Architects, AIA Indiana
Doug Fick; CMTA, Inc., ASHRAE

675 IAC 20 – Swimming Pool Code

During its meetings and as is referenced above under "The Committee's Priority Recommendations for Updating the Commission's Rules," the Committee determined that updating the Swimming Pool Code under 675 IAC 20 should be a "low priority" for the Commission, and the Committee does not recommend completing any rulemaking at this time.

675 IAC 22 – Indiana Fire Code (*See* "EXHIBIT G" below)

Comparison: 2014 Indiana Fire Code (2012 International Fire Code adopted by reference) to the 2021 International Fire Code

Prepared by: Joshua Frost; Zionsville Fire Department
Other Local Fire Officials

IMPORTANT NOTE: In "Exhibit H," the terms "minimal," "no impact," "none," and "negligible" are intended to be synonymous terms and mean that the change (update) in the code should create either very little or no fiscal impact.

675 IAC 25 – Indiana Fuel Gas Code (*See* "EXHIBIT H" below)

Comparison: 2014 Indiana Fuel Gas Code (2012 International Fuel Gas Code adopted by reference) to the 2021 International Fuel Gas Code

Prepared by: Brenda Dant; Indiana PHCC Association

675 IAC 28 – National Fire Protection Association (NFPA) Standards

As provided in the table above under "The Commission's Most Recent Rulemaking Actions on the Codes," the Commission has adopted and amended certain editions of the National Fire Protection Association's (NFPA) standards in Article 28 of its rules (675 IAC 28). Several of the Commission's adopted NFPA standards in 675 IAC 28 are editions of the standards that are now several years old, and even decades old in some instances. It is the Committee's assessment that the practice of readopting these standards and the failure to adopt more current standards, or at least rely on the standards referenced within the adopted national model codes, has created unnecessary hardships for several of the state's industries and poses a significant threat to the health and life safety of the citizens of Indiana.

As stated above under "The Committee's Priority Recommendations for Updating the Commission's Rules," the Committee recommends that the currently adopted National Fire Protection Association (NFPA) Standards and amendments provided in 675 IAC 28 be **repealed** if and when the Commission updates the family of codes are updated to the most recent editions of the national model codes, specifically when the Indiana Building Code and the Indiana Fire Code are updated to the most recent editions of the national model codes. To more easily interpret, apply, and enforce these standards, the Committee recommends that the Commission should simply utilize the standards that are already referenced within the national model codes. Reliance upon the standards that are referenced within the national model codes will also ensure that the standards are only as outdated as the applicable adopted codes.

IMPORTANT NOTE: If and when the Commission repeals the standards and amendments provided in 675 IAC 28 in lieu of adopting the standards referenced within any adopted national model code, the Commission, or any subcommittee it appoints, will be required to perform an in-depth fiscal impact analysis of the changes between the repealed standards (and their amendments) and the new standards, wherever the standards apply in the codes.

FRAMEWORK FOR ESTABLISHING SUBCOMMITTEES TO COMPLETE PROPOSED RULE PROMULGATIONS

To better organize and manage the rulemaking efforts of the Committee's code update priorities listed above, the Committee recommends that the Commission should form a "steering committee" that will oversee the progress of any code subcommittees established that will be tasked with reviewing national model code standards that will be adopted by reference and ultimately drafting the proposed rules that will be presented to the Commission for adoption.

EXHIBIT A1

Reference from Model Code Publication	Significant differences between current code and most recent edition	Specific issues the updated code is designed to address	Change would require additional regulation or reduced regulation?	Expected fiscal impact	Health or safety concerns addressed by code
202	Updated definitions refining the distinction between a stage and a raised platform in assembly occupancies	Clarifies that a raised platfrorm may have horizontal sliding curtains	reduces	($50,000)	Clarifies current code
202	Updated definitions of fire and preservative treated wood,	recognizes new lumber treatment technology	n/a	($50,000)	Updates code to recognize new technology
202	Definition of penthouse revised to include stairways	Clarifies that uppermost portion of a stairway to a roof is not a story	reduces	($10,000)	Clarifies current code
304.1	Clarification of the occupancy for small food processing establishments	Small food processing establishments, such as a bakery or catering kitchen less than 2,500 s.f. become a B-occupancy, easing the requirements for such small-scale operations.	reduces	($20,000)	Improves current code
304.1	Addition of training and skill development occupancies such as tutoring centers, and gymnastics studios to Business Group B.	These have frequently been interpreted to be assembly or educational occupancies under the current Indiana code, and have been the subject of a number of past variances as a result of the stricter classification.	reduces	($100,000)	Improves current code
307, 311	Distilleries, breweries, wineries, storage of beer, distilled spirits, wine in barrels or casks are no longer classified as group H	Clarifies code reqiurements for occupancies and uses currently not defined in Indiana code	reduces	($100,000)	Improves current code, recognizes marketplace changes
308.3	Revision of requirements for certain custodial care facilities	Aligns with common state licensing requirements. The changes include deleting outdated terms used in the code, and incorporation of new sub-categories to more closely align with common practices in the marketplace.	reduces	($50,000)	Updates code to recognize changes in marketplace and licensing regulations
310	Defines lodging houses, expands uses permitted in R4 occupancy	Allows owner-occupied lodging houses with five or fewer guest rooms to be regulatedunder residential code. Expands R-4 occupancies to include custodial care	reduces	($100,000)	Improves current code, recognizes marketplace changes
403.3	Water supply to fire pumps in tall mass timber buildings	Addresses issue of contribution to fire load of mass timber structures	adds	$50,000	Improves current code, recognizes marketplace changes, closes loophole
404	Numerous improvements in code requirements related to atriums	Clarifies requirements for issues such as egress travel through atriums, smoke control and horizontal assemblies	adds	$0	Improves current code

406	New sections addressing private garages, including groupings of multiple private garages such as ones used in some multi-family housing developments	allows multiple small private garages to be grouped and classified as U occupancies if separated by fire barriers	reduces	($10,000)	Updates code to recognize marketplace changes
407	Shared domestic cooking facilities, and shared living space regulations relaxed	Relaxed requirements for shared living spaces, group meeting rooms, therapeutic spaces and shared domestic cooking facilities in occupancies such as nursing homes. The requirements in the current Indiana code for such spaces have been the subject of numerous variances.	reduces	($400,000)	Updates code to recognize changes in marketplace and licensing regulations
410.3.5	Horizontal doors at stage openings	Allows 1-hour rated horizontal sliding doors to be used a stage proscenium openings, instead of fire rated curtains	adds	($10,000)	Updates code to recognize new technology
411.5	Addition of puzzle rooms as a new occupancy type.	Commonly called “escape rooms”, spaces such as these have been the subject of numerous variances because the current code is silent regarding these types of occupancies.	adds	($10,000)	Improves current code, recognizes marketplace changes, closes loopholes
	Clarification of occupancy type and requirements for energy storage systems				
414.2.3	Additional clarification to allow fire walls to be used to create multiple control rooms in high hazard occupancies.	Allows larger Group H occupancy buildings	reduces	$0	Updates code to recognize new technology
422.7	Domestic cooking in ambulatory care facilities	Relaxes requirements for domestic cooking under certain conditions	adds	($5,000)	Updates code to recognize new technology and marketplace changes
423	Storm shelter requirements	Requires storm shelters in critical emergency operation facilities, and E occupancies	adds	$100,000	Addresses shifting of tornado alley eastward to more populated areas, improves building resiliences, protects schools from tornadoes
424	Change in definition of and requirements for play structure occupancies	Expansion of play structure classifications to include uses for adults, such as rock-climbing walls, laser tag arenas, trampoline and skydiving facilities. Facilities such as these have been the subject of a number of past variances.	reduces	($20,000)	Updates code to recognize new technology and marketplace changes

503	Clarification of requirements for occupied roofs	Clarification of requirements for occupied roofs, including clarifying that they are not to be considered in the allowable story restrictions. Numerous buildings now have occupied roofs, and they are often used as an amenity in some developments. Repeated variances have had to address these as the current code is lacking in information regarding current marketplace trends.	reduces	($50,000)	Updates code to recognize new technology and marketplace changes
503, 504, 506	Revisions to the allowable height and area requirements	Makes code more user friendly. Formatting changes	n/a	$0	Improves code
508, 509	Addition of fire classification requirements for mass timber structures		reduces		
505	Clarifications to the open mezzanine requirements	Makes it easier to incorporate enclosed mezzanines in multiple occupancy types	reduces	($50,000)	Updates code to recognize new technology
507	Basements in unlimited area buildings	Basements now allowed in unlimited area buildings	reduces	($100,000)	Updates code to recognize new technology
508.5	Reformatting and clarification of requirements for Live/Work Units.	The current Indiana code was the first version of the model code to define and address live/work units such as an art studio, chiropractor's office, or small funeral home which also include a private residence. More recent model codes have greatly enhanced and improved the code provisions for these types of facilities. Another example frequently seen in past variance applications to the Commission has been small, one-room school buildings with an apartment used by certain religious communities common in Indiana.	reduces	($10,000)	Updates code to recognize new technology and marketplace changes
510.2	Stairway construction in podium buildings	Allows combustible stairways to be used for the full height of the building. These types of buildings are commonly found in the largest cities in Indiana and are frequently the subject of multiple variances for each development	reduces	($50,000)	Updates code to recognize new technology and marketplace changes

510.2	Allowance of horizontal fire separations in buildings.	This was the subject of an Indiana amendment in the current code. New codes provide much more comprehensive allowances to allow different types of construction and occupancies to be considered as separate buildings within the same structure	reduces	($50,000)	Updates code to recognize new technology and marketplace changes
601, 602	Engineered lumber, cross laminated timber, and mass timber construction	Extensive coverage of new wood technology such as engineered lumber, cross laminated timber, and mass timber construction, and creation of new construction types related to such technology	adds	$50,000	Improves current code, recognizes marketplace changes, closes loopholes
603.1	Combustible materials in Type I & II construction	Allowance of freezers and coolers in Type I & II buildings to be constructed of combustible materials; Use of wood blocking in non-combustible roof decks and parapets allowed	reduces	($50,000)	Improves current code, recognizes marketplace changes
703.6, 703.7	Mass timber construction protection	Recognizes new test data for contribution time of mass timber alone and protected by non-combustible construction such as drywall membranes	reduces	$0	Updates code to recognize new technology
704	Clarification as to protection of secondary members. Horizontal assemblies permitted to be protectd with ceiling membrane	Eespecially in light frame construction such as Type VA apartments this issue is often a source of confusion and contradictory interpretations under the current code	reduces	($100,000)	Updates code to recognize new technology
707.5	Exit passageway enclosures	Allows an enclosed top at exit passageways instead of extending enclosing walls full height to deck above	reduces	($50,000)	Updates code to recognize new technology
706.2	Firewall structural requirements	Revises definition of structural stability, incorporates NFPA 221, allows double fire walls. Double walls are frequently the subject of variance requests	adds	($50,000)	Updates code to recognize new technology
708	Supporting construction for fire partitions	Clarification to allow the use of non-fire rated type IIB and VB supporting construction for fire partitions,	reduces	($150,000)	Updates code to recognize new technology

709.4	Smoke barrier continuity	Revisions to distinguish between smoke compartments in I-occupancies and smoke barriers for areas of refuge and elevator lobbies. Allows unprotected openings in certain conditions	reduces	($50,000)	Improves code
711,712	Horizontal assemblies and vertical openings	Reformating and clarfication to make code more user-friendly	reduces	$0	Improves code
713.12	Top of shaft termination	Requirements clarified. Additional options for termination provided	reduces	($50,000)	Improves code
714.4	Membrane Penetrations	clarification that a double top plate may interrupt a rated ceiling membrane. This issue is a constant source of confusion and inconsistent enforcement	reduces	($500,000)	Improves code
715	Protection of joints and voids	Reformating and clarfication to make code more user-friendly	reduces	$0	Improves code
716	Doors in double fire barriers and fire walls	Incorporates NFPA 221 for double doors in fire walls, clarifies that two 3/4 rated doors may be used in double 1-hour rated walls such as at hotel rooms	adds	$0	Updates code to recognize new technology
717	Duct transitions between shafts	Allows ducts to transition horizontally between two vertical shafts	adds	($50,000)	Improves code
717.5.2	Flex duct penetrating a fire barrier	Allows a flex duct to penetrate a fire barrier without a fire damper	reduces	($150,000)	Updates code to recognize new technology
722.7	Mass timber fire ratings	Provides fire ratings for mass timber asseblies based on new test data	adds	$0	Updates code to recognize new technology
806.9	Wood lockers	Clarification that wood lockers may be considered an interior finish where they are applied along a wall	reduces	($10,000)	Updates code to recognize new technology and marketplace changes
903.2	Upholstered furniture and mattresses	Clarification and reformatting of sprinkler triggers for F-1 occupancies used for the manufacture of upholstered furniture and mattresses.	adds	$0	Updates code to recognize new technology
903.2	Sprinkler requirements for occupied roofs	Clarifies when an occupied roof used for assembly purposes triggers a sprinkler system in the building below.	adds	$50,000	Improves current code, recognizes marketplace changes, closes loophole
903.2	Distilled spirit sprinkler requirements	Clarifies sprinkler reqiuirements for Group F-1 fire areas used for distilled spirit manufacturing and Group S-1 fire areas used for bulk storage of distilled spirits and wine.	adds	$50,000	Improves current code, recognizes marketplace changes, closes loopholes

903.2	Multiple Group A fire areas	Clarifies that multiple Group A fire areas sharing a common means of egress are combined in evaluating sprinkler requirements	adds	$0	Improves current code, recognizes marketplace changes, closes loophole
903.2	Sprinkler requirements for Parking Garages	Requires sprinklers in certain open parking garages. Based on extensive use of plastics in automobile construction	adds	$100,000	Improves current code, recognizes marketplace changes, closes loophole
903.3.1.2	13R sprinklers at podium buildings	Clarifies height limitations for 13R sprinkler systems used in podium type buiildings	adds	$100,000	Improves current code, recognizes marketplace changes, closes loophole
903.3.1.2.2	Corridor and Balcony sprinkler protection	Closes loophole for open corridors and shared balcony sprinkler protection in NFPA 13R systems	adds	$50,000	Improves current code, recognizes marketplace changes, closes loophole
905.3.1	Standpipe requirements at parking garages	Revisions consistent with 903.2 changes regarding parking garages	adds	$50,000	Improves current code, recognizes marketplace changes, closes loophole
	Clarification of fire alarm requirements in multi-story self-storage buildings		reduces		
907.5.2.1.3	Low frequency fire alarm systems.	Recognition of low frequency fire alarm systems. These systems have proven to be six times more effective at waking certain at risk segments of the populations, such as children, the elderly, and people who are alcohol impaired	adds	$50,000	Updates code to recognize new technology
903.2.8	Clarification of sprinkler requirements for attics used as living purposes	Provides multiple fire protection options for attics used for living purposes and not used for living purposes in group R-3 and R-4	adds	$0	Updates code to recognize new technology and marketplace changes
903.3.1.1.2	Clarification of exempt locations such as small bathrooms in R-occupancies	Exempts bathrooms of < 55 s.f. from sprinkler protection in NFPA 13 systems	reduces	($100,000)	Updates code to recognize new technology and marketplace changes
904.13	Requirements for domestic appliances and domestic hoods used in Group I-2 kitchen facilities have been clarified.	Provides options for protection of domestic cooking equipment	adds	$20,000	Updates code to recognize new technology and marketplace changes
907.2.9.3	Fire alarm systems in R-2 College and University Buildings	Increase fire alarm requirements due to recent history of dormitory fires. Clarifies that requirements apply to housing operated by the university, but does not apply to housing over which the school or university does not have operational control	adds	$50,000	Improves current code, recognizes marketplace changes, closes loopholes

907.2.11	Smoke alarms near small bathrooms and near cooking appliances.	Clarification of placement of smoke alarms near small bathrooms and near cooking appliances. This is a source of frequent confusion in the current Indiana code	reduces	($50,000)	Updates code to recognize new technology
911	Fire command centers in F-1 and S-1	Adds a requirement for a fire command center in F-1 and S-1 buidlings larger than 500,000 s.f.	adds	$50,000	Improves current code, recognizes marketplace changes, closes loopholes
915	Carbon monoxide detectors	Reformatting to clarify CO detector requirements in various occpancies	adds	$0	Improves code
1006.2.1	Common path of travel requirements for unoccupied mechanical rooms	Common path of travel requirements for unoccupied mechanical rooms and penthouses eliminated.	reduces	($50,000)	Updates code to recognize new technology
1006.3	Egress requirements from occupied roofs clarified.	Clarifies that even though an occupied roof is not a story, the occupant load of the roof does not need to be combined with the story below, but can be considerred as if the roof is a story	reduces	($50,000)	Updates code to recognize new technology and marketplace changes
1004.1.2	Inclusion of new occupant load factors, office occupant load factor for offices changed to 150 s.f./occupant	Reduces occupant load requirements based on recent research	reduces	($500,000)	Updates code to recognize new technology and marketplace changes
1006.3.4	Single exit stories	Eliminates common path of egress requirement for single exit stories. Exiting requirements now based on travel distance	reduces	($250,000)	Updates code to recognize new technology and marketplace changes
1007.1	Remoteness test requirements	New remoteness test requirements to address converging stairs	adds	$25,000	Improves current code, recognizes marketplace changes, closes loopholes
1008.2.1	Stairway illumination	Light level increased in exit access stairs except at auditoriums and theatres	adds	$15,000	Improves current code, recognizes marketplace changes, closes loophole
1009.2.1	Accessible elevators to occupied roofs	Clarifies when an accessible elevator is required to an occupied roof	adds	$50,000	Improves current code, recognizes marketplace changes, closes loopholes
1009.6.2	Interior areas of refuge at level of exit discharge	Interior areas of refuge are now allowed as an accessible means of egress on the level of exit discharge	reduces	($50,000)	Updates code to recognize new technology
1009.6.3	Area of refuge floor space increase	Clear floor space for a wheelchair at an area of refuge increased from 30x48 to 30 x 52	adds	$0	deminimus change
1010.1.1	Door widths	Maximum 48" door width limitation eliminated; new exception allows for reduced door sizes serving single user spaces such as dressing rooms	reduces	($50,000)	Updates code to recognize new technology and marketplace changes

1010.1.1.1	Projections into door openings	Additional elements now allowed to encroach into the clear door opening	reduces	($50,000)	Updates code to recognize new technology and marketplace changes
1010.2.4	Clarification as to when locks and latches shall be permitted to prevent operation of doors from the egress side.	Clarification as to when locks and latches shall be permitted to prevent operation of doors from the egress side. As the desire for more secure facilities continues, this is a critically important topic.	reduces	($50,000)	Updates code to recognize new technology and marketplace changes
1030.16	Handrails at social stairs	Incorporation of requirements for “social stairs”. These are a design element frequently incorporated in higher education facilities, and now is migrating to other uses. The design incorporates a seating area that steps up adjacent to an egress stair. The current Indiana code does not recognize this condition and variances are required.	reduces	($100,000)	Updates code to recognize new technology and marketplace changes
1009.8	Two-way communication system from service and freight elevators, and residential elevators	Elimination of two-way communication system from service and freight elevators, and residential elevators	reduces	($25,000)	Updates code to recognize new technology and marketplace changes
1011	Permanent ladders	Clarification regarding use of permanent ladders to provide access to certain areas. The current code is unclear regarding many common uses of permanent ladders	reduces	($50,000)	Updates code to recognize new technology and marketplace changes
1016.2	Clarification regarding means of egress through enclosed elevator lobbies	Means of egress is now allowed to be through an elevator lobby in certain conditions	reduces	($50,000)	Updates code to recognize new technology and marketplace changes
1017.2.2	Increased exit travel distances in Group F-1 and S-1	Increased exit travel distances in Group F-1 and S-1 facilities clarified. This has been a source of confusion for decades. Indiana amendments have attempted to resolve the issue. The newest model codes provide greater flexibility than current Indiana codes. Increased travel distance is now a function of clear height and is no longer tied to ESFR or smoke/heat vents	reduces	($100,000)	Updates code to recognize new technology and marketplace changes
1018.3	Aisles in B & M occpuancies	Clarifies that minimum aisle width is a function of minimum corridor width	reduces	$0	Improves code

1020.2	Corridor width in I-2 clarifications	Reduced width allowed where bed or stretcher movement is not necessary	reduces	($50,000)	Updates code to recognize new technology and marketplace changes
1023.3.1	Stairway extensions	Clarifies that no separation is required between an exit stair and an exit passageway	reduces	($10,000)	Improves code
1107.2	Accessible vehicle charging stations	Inclusion of vehicle charging stations into the accessibility requirements of the code.	adds	$0	Updates code to recognize new technology and marketplace changes
1103.2.8	Raised and lowered areas in places of religious worship	New exception for raised or lowered areas in religious facilities. This topic has been the source of many variance applications	reduces	($20,000)	Improves current code, recognizes marketplace changes
1404.3	Vapor retarder provisions revised	Significant improvement and clarification to the vapor retarder requirements for building envelopes in Climate Zone 4 & 5 (Indiana). The new codes incorporate the latest research and product technology for this vitally important element. The current Indiana code is outdated, and allows practices that can create serious mold and deterioration problems in a building.	reduces	($500,000)	Updates code to recognize new technology and marketplace changes
1210.3	Restroom privacy	Updates regarding restroom privacy. The commission has seen numerous past variance applications related to this issue	adds	$50,000	Improves current code, recognizes marketplace changes, closes loopholes
2612	Plastic composites	Adds provisions for the use of plastic composite materials and plastic lumber	reduces	($100,000)	Updates code to recognize new technology and marketplace changes
2902.3	Public toilet facilities in limited size, quick service tenant spaces	Public toilet facilities no longer required in such spaces (employee toilet still required)	reduces	($100,000)	Improves current code, recognizes marketplace changes
2902	Separate toilet facilities	Adds options for providing multiple user facilities serving all genders. Eliminates need for variances	reduces	($50,000)	Improves current code, recognizes marketplace changes
3004	Elevator hoistway venting	All hoistway venting requirements have been deleted	reduces	($100,000)	Updates code to recognize new technology
3115	Intermodal shipping containers	The use of intermodal shipping containers as buidings and structures is now allowed, and criteria defined for their use.	reduces	($50,000)	Updates code to recognize new technology and marketplace changes

Chapter 34	Chapter 34 deleted	References added to International Existing Building Code. The IEBC provides a more consistent and coordinated document, and in addition to the contents of Chapter 34 from the building code, the IEBC provides options for different scale renovations. Several of these options do not require full compliance with all provisions of the building code	reduces	($500,000)	Updates code to recognize new technology and marketplace changes
	Numerous improvements to the structural code provisions in Chapter 16, incorporating the latest research. AIA Indiana also supports adoption of Chapter 17 of the model IBC and asks the Commission and its staff to facilitate any statutory changes necessary to allow its adoption	See analysis by Structural Engineering Organization			
				($4,550,000)	

EXHIBIT A2

2021 IBC Section	Change from Current	Issues Addressed	Benefits of Updating	Increased or Decreased Regulation	Fiscal Impact	Health and Safety Concerns Addressed
423.4	Increased guidance regarding design, location and capacity of storm shelters	Guidance for design and placement of storm shelters ambiguous in previous codes	Clarifies design and placement of storm shelter	Same	Increased cost due to additional requirements to construct storm shelters.	Increased safety by providing clear guidance on the design, occupant load and placement of storm shelters including increased access to storm shelters
1603.1	Added requirement that roof slope factor, machinery and rain intensity loads be shown on construction documents	Determination of roof slope factor for a project previously required a review of the calculations.	Simplifies review by clearly stating design factors	Same	None	Simplifies review increasing likelihood a design error will be identified and corrected thereby increasing public safety.
1603.1.3	Added requirement that drift load and width be shown on construction documents	Determination of drift loads for a project previously required a review of the calculations.	Simplifies review by clearly stating design loads	Same	None	Simplifies review increasing likelihood a design error will be identified and corrected thereby increasing public safety.
1603.1.8.1	Solar panel loads shown on construction documents	Determination of solar panel loads for a project previously required a review of the calculations.	Simplifies review by clearly stating design loads	Same	None	Simplifies review increasing likelihood a design error will be identified and corrected thereby increasing public safety.
Table 1604.3	Additional information provided for deflection limits of glue lam wood members in Note D	Clarifies deflection limit	Reduced likelihood of damage to interior finishes and supported elements by defining deflection limits	Same	None	None
Table 1604.5	Clarification to Risk Category III occupancies	Clarifies previously ambiguous risk category determination	Clear guidance when determining risk category	Same	None	Increased safety by providing clear guidance on risk category determination
1607.12.1.2	Clarifies live load reduction for live loads in excess of 100 psf	Previous code provisions were unclear	Previous guidance was unclear likely resulting in overly conservative designs	Same	Reduced cost due to fewer structures designed with overly conservative live loads	None
1609	References ASCE 7-16	Updates out-of-date standard	Reduces basic wind speed for risk category II from 115 mph to 107 mph resulting in more economical structures	Same	Reduced cost due to lower loads for risk category II structures	None
1604.10	Loads for storm shelters added to be in accordance with ICC 500	Addresses conflicting loading for storm shelters	Eliminates conflicting design loads clarifying design	Same	None	Increased safety by providing clear guidance on storm shelter loads and eliminating conflicting information
1606.4	Added clarification that solar panels are considered dead load	Clarifies previously ambiguous loading categorization	Clear design load provisions for easier design	Same	Reduced cost. Reduced demands due to lower load factor results in lower construction costs.	N/A
1606.5	Added clarification that vegetative roofs are dead loads	Clarifies previously ambiguous loading categorization	Clear design load provisions for easier design	Same	Reduced cost. Reduced demands due to lower load factor results in lower construction costs.	N/A
Table 1607.1	Additional occupancies added for live loads for clarification	Defines loads for previously undefined occupancies	Clear guidance when determining loads	Same	None	Increased safety by providing clear guidance on live loads
Table 1607.1	Increased live loads for balconies. Increased to 1.5 * live load for area served, not required to exceed 100 psf	Multiple balcony failures occurred due to insufficient load capacity	Increased public safety	Same	Increased cost due to additional support framing.	Increased public safety due to greater load capacity for balconies which have experienced numerous failures leading to injury and loss of life.
1607.7	Passenger vehicle garage loads added clarifying loads for these structures	Provides clear guidance for loads to be used in design	Clear design load provisions for easier design	Same	Reduced cost. Reduced demands due to larger contact area and reduced pressure from wheel concentrated loads.	Increased public safety due to greater clarity regarding loads to be used in design.
1607.11.3	Loads added for elements supporting hoists and facade access equipment	Defines loads for previously undefined elements	Clear guidance when determining loads	Same	None	Increased safety by providing clear guidance on loading for critical elements
1607.11.4	Loads added for lifeline anchorages for facade access equipment	Defines loads for previously undefined elements	Clear guidance when determining loads	Same	None	Increased safety by providing clear guidance on loading for critical elements
1607.14.2.2	Additional information provided for design loads of Vegetative roofs	Defines loads for previously undefined situations	Clear guidance when determining loads	Same	None	Increased safety by providing clear guidance on loading
1607.14.4	Clarification for roof live loads with solar panels	Clarifies previously ambiguous loading	Clear design load provisions for easier design	Same	None	Increased public safety due to greater clarity regarding loads to be used in design.
1607.16.2	Fire walls required to resist 5 psf lateral load	Loads for fire walls previously undefined	Clear design load provisions for easier design	Same	Increased cost due to additional support framing.	Increased safety to public and first responders by increasing structural stability of a building when structure on either side of a fire wall has collapsed.
1607.17	Loads added for fixed ladders	Provides clear guidance for loads to be used in design	Clear design load provisions for easier design	Same	None	Increased public safety due to greater clarity regarding loads to be used in design.
1607.19	Loads added for assembly seating	Provides clear guidance for loads to be used in design and is consistent with ICC 300 for the design of bleachers.	Clear design load provisions for easier design	Same	None	Increased public safety due to greater clarity regarding loads to be used in design.
1607.20	Loads added for sidewalks, yards subject to trucking	Provides clear guidance for loads to be used in design	Clear design load provisions for easier design	Same	None	Increased public safety due to greater clarity regarding loads to be used in design.
1607.21	Loads added for stair treads	Provides clear guidance for loads to be used in design	Clear design load provisions for easier design	Same	None	Increased public safety due to greater clarity regarding loads to be used in design.
1607.22	Loads added for residential attics	Provides clear guidance for loads to be used in design	Clear design load provisions for easier design	Same	None	Increased public safety due to greater clarity regarding loads to be used in design.
1610.2	Hydrostatic uplift loads added for floors and foundations	Provides clear guidance for loads to be used in design	Clear design load provisions for easier design	Same	None	Increased public safety due to greater clarity regarding loads to be used in design.

Chapter 17	Indiana Building Code 2014 states: Sec. 19. Chapter 17 is amended as follows: Amend Chapter 17, Special inspections and tests, by deleting the text and inserting to read as follows: See the General Administrative Rules (675 IAC 12-6-6(c)(10)(C)) and Industrial Building Systems (675 IAC 15).(Fire Prevention and Building Safety Commission; 675 IAC 13-2.6-19; filed Aug 1, 2014, 11:12 a.m.:20140827-IR-675130339FRA, eff Dec 1, 2014). By keeping Chapter 17 in the new code, Indiana will fall in line the vast majority of all other states.	With Chapter 17 removed, it falls on the engineer to request special inspection in the construction documents. As a result, special inspections rarely occur, because the contractor and owner do not want to pay for it. Without special inspections the risk of construction errors increases.	Increased probability that construction will comply with intended design and intended construction. Increased public safety by reducing mistakes, errors and oversights during construction.	Increased	Modest increase in overall building cost: a. Example of added project cost for a 200,000 s.f., three-story office building: i. Full-time inspection: 40 hours x 8 weeks = 320 hours. ii. Assumed inspection cost = $150/hr. iii. Inspection cost = 320 hours x $150/hr = $48,000. iv. Assume total building cost = 200,000 sf x $250/sf = $50,000,000. v. Inspection cost = $48,000/$50,000,000 = 0.10% of total cost. b. As illustrated in the above example, the inspection cost is extremely low relative to the building cost.	Increased public safety by reducing construction errors
1901.2	References updated concrete standard, ACI 318-19	Adds chapter for design of diaphragm and collector elements in low seismic zone	Allows for proper design of these critical elements.	Same	None	Increased public safety due to greater clarity regarding loads to be used in design.
2101.2	References updated masonry standard, TMS 402-16	Adds requirements for shear friction capacity of masonry shear walls	Allows for proper design of these critical elements.	Increased	Possible increased cost if walls were not previously designed for shear friction	Increased public safety due to requirement that shear friction be included in design of masonry walls
2101.2	References updated masonry standard, TMS 402-16	Accommodates increased insulation thickness	Greater energy efficiency	Same	Decreased cost due to potential for greater energy efficiency	None
2107.2.1	Adds maximum limit for rebar lap splices of 72 bar diameter	Previous lap length requirements were overly conservative	More economical design	Same	Reduced cost by allowing for more economical design	None
2205	References updated steel standard, AISC 360-16	Previous versions of AISC 360 were more restrictive in design and updated code allows for greater design flexibility	Allows for more options in design and more accurate analysis resulting in more economical structures	Same	Reduced cost by allowing for increased design option	None
2208	References updated steel standard, ASCE19-16	Provides for provisions for small diameter cables	Smaller cables results in lower construction costs due to less material and supporting structure	Same	Reduced cost by allowing for more economical design	None
2210	References updated steel standard, AISI S100	Previous version of AISI limited use of strength design.	Uses latest design methods for more accurate analysis	Same	Reduced cost by allowing for more economical designs	None
2210	References updated steel standard, AISI S100	Increase in factor of safety required for connections, for both LRFD and ASD designs	Greater safety to occupants	Same	Increased cost due to higher load demands	Increased public safety due to connections capable of supporting increased loads
Chapter 23	Adds section for Cross Laminated Timber allowing for the use of new materials	Greater material selection capability	Reduced building cost via greater material selection and increased competition. Allows for greater use of a sustainable material.	Same	Reduced cost via greater material selection and increased competition	None
2304.12.2.5	Adds ventilation requirements below balconies	Reduces common risk of wood rot and collapse	Reduces common risk of wood rot and collapse	Same	Increased upfront cost but reduced life cycle cost by reducing repairs due to rot	Increased public safety by reducing risk of collapse
Chapter 35	References most recent design standards	Updates out-of-date standards	References are based on most recent research	Varies	Varies	Increased public safety by incorporating knowledge gained from most recent research

EXHIBIT B

Indiana currently adopts the 2020 Indiana Residential Code, which adopts the *2018 International Residential Code* with Indiana amendments (*see* 675 IAC 14-1.4). In review of the *2021 International Residential Code*, there were very few significant changes made to the 2021 edition. Many of the additions, modifications, and clarifications address seismic and hurricane wind issues identified as issues because of recent events and energy code requirements. Many of the modifications and clarification changes made in the 2011 edition were addressed by the last code committee that adopted the 2018 edition, which became effective December 26, 2019. In reviewing these issues, it is this committee's recommendation that the Indiana Residential Code not be updated to the latest national model code edition at this time. The table provided below reviews the items added to the *2021 International Residential Code* that were not included in the *2018 International Residential Code*. None of the additions warrant an update at this time. The small number of modifications and clarifications made to the 2018 edition in the 2021 edition could easily be followed up on separately by the Indiana Residential Code Committee and handled though a follow-up code change process if determined necessary without adoption of the 2021 edition.

Section Added	Change	Impact
301.1.4	Provisions for construction with intermodal shipping containers are added to the *International Residential Code* (IRC).	No impact in Indiana. Where shipping containers are currently provided, units fit the parameters of ISO shipping containers and meet the local building codes. The 2021 edition of the IBC will provide additional insight into the use of shipping containers for commercial and residential construction and allows for alternate methods and materials, which can currently be addressed by variance.
301.2.2.6	Irregular building limitations now include hillside light-frame construction.	Limited impact in Indiana. Addresses light-frame dwellings on steep hillsides. The typical assumption of floor loads transferring to braced wall panels based on the tributary area of a flexible wood floor does not work for adequate seismic performance in earthquake prone areas in Seismic Design Categories C, D0, D1, and D2.
323	Added guidance on the design of storm shelters is placed in Section R323.	Limited impact in Indiana. Code addition requires compliance with requirements of ICC 500 Standard for the Design and Construction of Storm Shelters when constructing Storm shelters in one- and two-family dwellings. This guide is best practice and available for use currently.
R408.8	Where exposed to grade in a crawl space, a Class I or II vapor retarder is required on exposed air permeable insulation between floor joists in Climate Zones 1A, 2A and 3A.	No impact in Indiana, which is located in Zones 4 and 5.

R609.4.1	All garage doors must have a permanent label identifying wind pressure ratings among other information.	Limited impact in Indiana. Code addition addresses sustainability in the way buildings are constructed. Labeling provides building owners and occupants more information about the sustainability of the buildings they occupy, information to determine how critical components are expected to perform. Some manufacturers already include permanent labels on their products that provide traceability to the manufacturer and the product characteristics.
R-704	Requirements for soffit material and installation are expanded.	No impact in Indiana. Specific material requirements are added for soffits to clarify their wind performance when using IRC installation provisions for common manufactured soffit types. This section was added to address failures noted during recent hurricanes in new and existing construction.
R905.4.4.1	Requirements for metal shingle wind resistance are added to Section R905.4.	Limited impact in Indiana. Due to differences in performance of asphalt and metal shingle a new test standard has been developed and added to the code for Steep roofs in high wing areas.
M1802.4	An additional safety device for oil-fired appliances has been added to be consistent with what is required for some gas-fired appliances.	Limited impact in Indiana. Only about 7% of Indiana's one- and two-family dwellings use hydrocarbon gas liquids, mostly propane, for space heating, and fewer than 1% use fuel oil or kerosene.
E3601.8	An emergency service disconnect is required in a readily accessible outdoor location.	Limited Impact in Indiana. The electrical provisions currently a service disconnecting means either outside of the building or inside the building at a location nearest the point of entrance of the service conductors. Indiana reviewed an amended this section in the 2020 IRC.
E3606.5	A surge-protective device (SPD) is now required at the service panel.	Limited Impact in Indiana: Modern day electronics are prevalent in homes and have become more sensitive to electrical surges, which may damage components or result in data loss. The 2021 code requires a surge-protective device (SPD) located integral to or immediately adjacent to the service equipment. The new requirement is in response to an identified need for surge protection of sensitive electronic devices including appliances, GFCI and AFCI devices and smoke alarms. Would only affect new homes and is not immediately related to health or safety.

EXHIBIT C

2006-2021 IPC Code Comparison

Reference from 2021 Publication	Change from Current	Fiscal Impact
314.2.2	Allows PVDF and PE-RT condensate drain pipe and fittings	Increases design options
405.3.1	New spacing provision for juvenile water closets	Increases design options
405.5	Allows plumbing fixtures with pumped waste	Lower cost solution for certain toilet installations
407.1, 408.1, 410.1, 412, 415, 416, 419, 422, 424, 425, 426	Updated standards for fixtures and faucets	Reduces confusion in fixture selection
502.1.1	Allows FVR compliant water heaters to be installed directly on a garage floor	Reduces costs for water heater installations
T604.8, T605.3, T605.4, T605.5, T605.7	Updated standards for water distribution pipe and valves	Increases design options
605.13.5	Allows press connect fittings	Faster installation reduces costs
605.13.7	Allows push-fit fittings	Faster installation reduces costs
607.2	Reduces the distance from the hot water source to the fixture to 50 feet (was 100)	Speeds access to hot water, saves water and associated water costs.
607.12	Allows hot water temperature control in certain water heaters in lieu of temperature control devices	Reduces costs and improves safety
T608.1	Updated standards for toilet fill valves	Improves product safety
T702.1, T702.2, T702.3	Allows PVDF pipe and fittings and updated standards	Increases design options
705.10.4	Allows for push-fit DWV fittings	Reduces labor costs
716, 717	Allows for pipe bursting and pipe realigning	Reduces sewer repair costs
1002.4.1.5	Allows certain fixtures to drain into a floor drain tail piece in lieu of trap primer	Reduces costs
T1102.4	Allows PE and PP storm drain piping	Increases design options and reduces costs
1106	Completely new storm water drain pipe sizing method	Improves roof drain calculations
1107	Allows siphonic roof drain systems	Reduces rain impact on storm drains
1109	Requires separate storm and sanitary connections to a combination sewer	Improves drain performance
Three Year Update Cycle	Changes are indicated every edition.	Update costs are reduced when updated with the code cycles; when multiple cycles pass, the updates are not marked in the most current book for the editions that are missed. The committee must review all editions to determine all changes that were missed to determine acceptability. Sometimes those sections will be changed again in later editions. Additionally, the code promulgator provides training on the updates at the regular update intervals.

Section 424.1 Urinals	Updates Urinal standards to ASME A112.19.2/CSA B45.1	This standard is a harmonized version of two previous standards and as such the numbering method is different in the newer codes. An inspector in a northern Indiana jurisdiction refused installation of products because the new harmonized industry accepted standard was not listed in the current edition of the Indiana adopted code causing expense and delay to the contractor while seeking a solution to the issue.
Section 605.2.1 Lead Content of Drinking Water Pipe and Fittings	Adds Federal Drinking Water Standards in effect since 2012	Reduces lead content of drinking water and reduces state and local liability for lead contamination in drinking water due to outdated language.
Section 917	Allows Single Stack Vent system	Reduces cost in multi-story by combining drains and vents in one set of piping, results in fewers holes and less pipe.

EXHIBIT D

ADVANCING ELECTRICAL SAFETY THROUGH THE NATIONAL ELECTRICAL CODE

May 2021

OVERVIEW

The National Electrical Code® (NEC), developed by the National Fire Protection Association (NFPA), has been the foundation of the country's electrical safety system since 1897. The NEC is created through an exhaustive stakeholder consensus process that considers input from a balance of interests and reflects the collective knowledge of qualified electricians, electrical inspectors, manufacturers, testing lab personnel, and other professionals. Updated triennially to include technological advancements, adopting the latest version of NEC is the best way to ensure uniform implementation of installation requirements and consistency throughout the built environment.

As electrical product and delivery technology evolves, so to do the challenges of safely integrating the technology into our electrical systems. Each three-year updated version of the NEC ensures that electrical installations continually meet minimum safety requirements so that electrical systems perform as expected while preventing harm to life and property. Revised codes address technological advancements such as wind, solar, energy storage and electric vehicles, thus enabling safety regulations to support, rather than obstruct installations that accommodate these innovations.

The current Indiana electrical code is based on the 2008 edition of the NEC, which has been revised ***four times*** in the interim. The latest update issued by the NFPA Standards Council is the 2020 edition. Each new version of the NEC builds upon the legacy established by preceding editions and contains new and revised requirements that enable the industry to meet consumers' expectation of a safe electrical system.

Just a few examples of updates to the past four editions of the NEC include requirements for leading edge technology such as that associated with electric vehicles and alternative energy systems like solar and wind power that must be installed and used safely in order for the public to derive their full benefit.

Additionally, new requirements have been added for utility-scale PV systems, direct-current microgrids and energy storage systems; all examples of the regulatory world striving to keep up with innovation.

Significant changes to rules governing calculations to modernize and reflect improvements in energy efficiency, which may provide relief on the overall cost of electrical systems, is another example of how an outdated code is out of alignment with industry trends. We also see advancements with each new edition to increase safety for electricians and maintenance personnel, as well as improved and expanded electrical safety requirements throughout all occupancies and uses in the built environment.

These are just a few ways in which adopting the latest edition of the NEC enables communities to continue providing an acceptable level of public safety while supporting the latest technological advances. States neighboring Indiana as well as states across the country have adopted more up-to-date versions of the NEC and citizens in Indiana certainly deserve the same protection.

This document presents a chronology of significant changes to the NEC over the last four code revision cycles that enhance the safety mission of the code and provide opportunity for more cost-effective installations.

2020 NEC Updates

Keeping the regulatory document current with industry trends in new technology and delivery and generation of electric power.

- 230.67. A new requirement covering surge protection for dwelling units aligns with the everchanging electrical industry landscape to protect against surges that can damage sensitive electronics found in most modern appliances, safety devices and other equipment used in dwellings. The expanded use of distributed energy resources can also contribute introduction of surges into the system.
- Several new sections throughout the Code address whether equipment is permitted to be reconditioned.
- Article 242 Overvoltage Protection – A new article addresses installation requirements for Surge-Protective Devices and Surge Arrestors used to achieve this protection.
- Article 625 Electric Vehicle Power Transfer System – Sets requirements for electric vehicles and supply equipment to encompass bidirectional current exchange.
- Updates to Articles 690 Solar Photovoltaic (PV) Systems, 691 Large-Scale Photovoltaic (PV) Electric Supply Stations, 706 Energy Storage Systems, Article 710 Standalone Systems and Article 712 Direct-Current Micro-grids continue to support new and expanding technologies, which has immeasurable societal benefits at both the micro- and macro-economic levels.

Examples of new and revised requirements that may lower the overall cost of electrical systems.

- 210.11(C)(3) & (4). This revision specifies which receptacle outlets are required to be on the required 20 ampere circuit for bathrooms and garages, thus providing more flexibility with circuiting in those areas.
- Article 220 Branch-Circuit, Feeder, and Service Load Calculations – Several revisions to this article, including the modernization of the tables currently in use for calculations, which has been extensively revised to reflect improvements in energy efficiency and may grant substantial relief for sizing of service and feeder distribution systems.
- 225.30(B). This has been revised to permit multiple smaller feeders, with smaller conductors and lower rated overcurrent protective devices to allow more flexibility with the design.
- 250.104(A)(1). Revised to provide relief with the maximum sized bonding jumper for bonding metal water piping systems.

Protecting electrical workers who maintain or service electrical or electrically powered equipment.

- 110.26(C)(3). Changes to revise working space requirements for non-dwelling unit large electrical equipment installations.
- 230.62(C). A new requirement that provides additional shock protection with barriers to be placed in service equipment to prevent inadvertent contact.
- 230.71(B). Current requirements for service disconnecting means is revised by eliminating risk from the inability to establish electrically safe conditions for energized work that must be performed within service equipment enclosures with more than one service disconnect.

- 240.67 & 240.87. Revised requirements for arc energy reduction to ensure it is set to operate at less than the available arcing current and prohibits temporary adjustment of the instantaneous trip setting as the method for meeting the requirement for circuit breakers.
- 408.18(C). A new requirement for manufacturers to provide a label on the front of equipment when working space is required for rear or side access to the equipment.

Protecting patient sleeping rooms in nursing homes and limited-care facilities from fires of electrical origin

- 210.12. Arc-fault circuit interrupters (AFCIs) are the most advanced technology currently recognized by the NEC for protecting premises against fires resulting from damaged wiring. Revisions to AFCI requirements expand this protection to these occupancies.

Protecting people from electric shock in homes, workplaces, and places of recreation.

- 210.8. New requirements applicable to ground-fault circuit interrupter (GFCIs) expand the protection across additional uses and occupancies not addressed in previous editions of the NEC. First introduced in the early 1970s, their continued expansion to areas in homes and workplaces where occupants are particularly susceptible to electric shock accidents is directly related to reductions in electrocutions and electric shock accidents.
- Revision to add “floating buildings” to the scope of Article 555 and revised to provide greater flexibility regarding the application of ground-fault protection requirements.

2017 NEC Updates

Keeping the regulatory document current with industry trends in new technology and delivery and generation of electric power.

- Article 425 Fixed Resistance and Electrode Industrial Process Heating Equipment – new article addresses installation requirements for fixed industrial process heating employing electric resistance or electrode heating technology.
- Article 691 Large-Scale Photovoltaic (PV) Electric Supply Stations - new article addresses requirements for large scale PV systems of no less than 5000 kW that are used to deliver power back to the utility grid.
- Article 706 Energy Storage Systems - Another new article to cover installation requirements for energy storage systems. The current state of energy storage technology, which includes batteries, and the anticipated evolution of energy storage supports the need for a singular set of requirements in the NEC covering such systems.
- Article 710 Standalone Systems - New article to address requirements for electric power production sources operating in a stand-alone mode independent of an electrical production and distribution network.
- Article 712 Direct-Current Micro-grids - New requirements to address micro-grids as they are becoming popular as a means to increase energy efficiency, reduce costs, and maintain critical business continuity. Powering utilization equipment directly from dc sources without intervening dc-ac and ac-dc conversion steps leads to higher efficiencies and potentially smaller, lower-cost equipment than ac-coupled methods.
- Article 690 - Revised requirements covering the expanding use of solar photovoltaic power. This will enhance first responder safety when performing operations on a roof by establishing a boundary creating two areas of rapid shutdown protection, providing separate requirements for protection inside and outside of the boundary, and specifying performance requirements for the rapid shutdown equipment inside and outside the boundary.

- Article 625 - Amended requirements for including wireless charging technology installation requirements for electrical vehicles.

Examples of new and revised requirements that may reduce the overall cost of the electrical system.

- 220.12. New exception for banks and office occupancies to permit reduced lighting load based on allowable load density prescribed by adopted energy codes. This may grant substantial relief for sizing of service and feeder distribution systems.
- Deletion of Table 310.15(B)(3)(c). This removes the required temperature adder for ambient temperature adjustment correction when calculating size of conductors installed on rooftops exposed to sunlight unless conductors are installed 7/8" or closer to the roof.
- 310.15(B)(7). Expands the use of 83% reduction for 3-conductor feeders (2 ungrounded and a neutral) derived from either single or three phase supplies.
- 338.10(B)(4) Revised to only require cables with 10 AWG and smaller conductors to default to the 60 degree C ampacity when installed in insulation.
- 210.8. New language covering all GFCI requirements that involve a measurement to determine receptacle proximity.
- 210.52(B)(1). Revision to expand permitted appliances in rooms or areas required to be supplied by a 20-ampere small appliance branch circuit to be supplied from an individual branch circuit rated 15 amperes or greater.
- 210.64. An amendment to only require a receptacle for service equipment located indoors and a new exception for services rated more than 120 volts to ground that supply certain types of equipment.

Protecting electrical workers who maintain and service electrical or electrically powered equipment.

- 110.16. Revision to require additional marking requirements for non-dwelling unit service equipment rated 1200 amperes or more.
- 110.26. New requirements that include working space for equipment located in a space that has limited access.
- 240.87. Revised requirements for arc energy reduction provide additional methods for acceptable arc flash mitigation and provide arc energy reduction requirements for fuses rated 1200 amperes or greater.
- 409.22, 620.51 & 670.5. New requirements for marking equipment with the short circuit current and maximum available fault current for elevators, industrial machinery, and industrial control panels.
- 404.22. New requirements for electronic lighting control switches to prohibit the introduction of current on the equipment grounding conductor during normal operation.
- 408.3. New provision that requires barriers for panelboards to provide a measure of safety against inadvertent contact with line-energized parts during maintenance and installation of new feeders or branch circuits.
- 670.6 & 695.15. New requirement for surge protection for industrial machinery and fire pump controllers.

Protecting hotels and motels from fires of electrical origin

210.12. Provides expanded coverage from arc-fault circuit interrupters, the most advanced technology recognized by the NEC for protection against fires resulting from damaged wiring - to hotel and motels.

Protecting people from electric shock in homes, workplaces, and places of recreation.

- 210.8. New requirements for use of GFCIs to expand protection from these devices across a range of uses and occupancies.
- Revision to add boatyards and commercial and noncommercial docking facilities to the scope of Article 555 and to lower the ground-fault protection threshold to a maximum 30 mA.
- Article 680, Part VIII. New series of requirements covering the certification, marking, protection, and field installation of “electrically powered pool lifts.”

2014 NEC Updates

Keeping the regulatory document current with industry trends in new technology and delivery and generation of electric power.

- Revisions that change the voltage thresholds from 600 to 1000 volts in recognition of commonly used alternative energy systems that operate at more than 600 volts. This will lead to revised equipment voltage ratings within product standards to accommodate higher operating voltages of systems such as PV and wind power.
- Article 694 - A new article introduced in the 2011 NEC addressed requirements for small wind electrical systems of 100 KW and smaller. This article has been revised to apply to all wind systems, ensuring that regardless of size, minimum electrical safety requirements are in place.
- Article 646 - A new article for Modular Data Centers. These new systems are becoming prominent in the demand for business systems to meet a 100% up-time-for-business continuity.
- Article 690 - Revised requirements covering the expanding use of solar photovoltaic power, including a new requirement for a rapid shutdown of PV systems on buildings to lower the power to a level intended to prevent a shock hazard to first responders performing firefighting operations on a roof.
- Article 393 - New article and installation requirements for Low Voltage Suspended Ceiling Power Distribution Systems
- Articles 410 and 600 - Extensive upgrades are underway to achieve greater energy efficiency in signs and luminaires by replacing in-place illumination systems with LEDs. New requirements ensure that “retro fit kits” employed meet minimum product safety standards through listing requirements.
- Article 625 - New and revised requirements covering electric vehicle charging equipment that keeps the regulatory document in step with the increase in consumer demand for all-electric and hybrid- electric vehicles. New provisions that allow an automatic load management system that may grant relief on sizing of service and feeders.

Energy management is common in modern electrical infrastructure through the control of utilization equipment, energy storage and power production. Several new requirements in 2014 addressed safe interaction with these energy management systems, while others provide substantial relief on the overall cost of the electrical system.

- Article 750 - A new article that provides requirements to cover loads where continuity of power cannot be compromised or where automatic disconnection creates a hazard for the public such as shutting off emergency circuits.
- 220.12. New exception to permit calculation of the general lighting load to be performed as per locally adopted energy codes. This may grant substantial relief for sizing of service and feeder distribution systems.
- 404.2(C). The 2011 NEC included requirements for a grounded conductor to be provided at switch location to address switching devices, such as occupancy sensors and their safe connection to the electrical system. The 2014 edition grants relief by providing alternative methods of compliance.
- 406.3(E). New marking symbol requirement for receptacle outlets controlled by an automatic control device or by an automatic energy management system to ensure safe interaction and ensure business continuity.

Protecting electrical workers who maintain or service electrical or electrically powered equipment.

- 110.25. New requirement that provides uniform conditions for locking off switches that control power to equipment to ensure that electrical workers can service and maintain equipment safely. This correlates with federal occupational health and safety regulations covering safe work practices on and about electrical equipment.
- 110.26. Revisions to egress door requirements to address worker safety in the event of an arc flash or arc blast incident.
- 110.21. Revised to provide uniform hazard marking where caution, warning, or danger signs or labels are required by this referenced standard.
- 240.87. Revised requirements for Arc Energy Reduction to expand methods for acceptable arc flash mitigation methods.

Protecting homes and dormitories from fires of electrical origin.

- 210.12. Revisions to AFCI requirements expand this protection and provide additional methods for compliance.

Protecting people from electric shock in homes and workplaces.

- 210.8. New requirements for GFCI application.

Changes impacting safety in Healthcare Facilities

- Several changes throughout Article 517, which addresses safety installation requirements for electrical systems installed in healthcare facilities.

2011 NEC Updates

Keeping the regulatory document current with industry trends in new technology and delivery and generation of electric power.

- New Article 840 includes requirements for equipment associated with broadband communication systems.
- New Article 399 adds requirements for outdoor overhead conductors over 600 volts.
- New Article 694 adds requirements for small wind electrical systems of 100 KW and smaller.
- Article 625 revised to include hybrid- electric vehicles under the scope of the article.

- Article 645 - Extensive revisions to provide greater flexibility with design for information technology equipment installations.

Protecting electrical workers who maintain or service electrical or electrically powered equipment.

- 240.87. New requirement to provide a method for reducing incident energy for non-instantaneous trip circuit breakers.
- 410.130. Requirement to install disconnecting means when ballasts are replaced in existing luminaires.
- 110.24. New labeling requirement for service equipment to identify the maximum available fault current.

Protecting people from electric shock in homes and workplaces.

- 210.8. Additional requirements for ground-fault circuit interrupter protection (GFCI).
- 555.3. New requirement to provide ground fault protection for the main overcurrent device supplying marinas and boatyards to help prevent electric shock drowning.
- 404.2(C). New requirement for installation of a grounded conductor at switch locations where lighting loads are controlled.
- 406.12. Expands tamper-resistant receptacle requirements to guest rooms, guest suites, and childcare facilities.

The regulatory community has relied on the NEC for over 100 years to meet society's demand for safe electrical installations. Adopting the most current edition of the NEC is a vitally important, proactive step for consumer protection and for the safe advancement of new electrical system technology. By taking that step, commission members will ensure greater electrical safety for the citizens of Indiana.

If you have questions or would like additional information, contact Mr. Tim McClintock, Midwest Field Representative for the National Electrical Manufacturers Association, at 330- 749-9782 or tim.mcclintock@nema.org.

ADVANCING ELECTRICAL SAFETY THROUGH THE NATIONAL ELECTRICAL CODE

Supplemental Outline

September 9, 2021

Keeping the regulatory document current with industry trends in new technology and delivery and generation of electric power.

NEC Edition/Section	Summary of Change	Fiscal Impact
2020 Section 230.67	A new requirement covering surge protection for dwelling units aligns with the everchanging electrical industry landscape to protect against surges that can damage sensitive electronics found in most modern appliances, safety devices, and other equipment used in dwellings. The expanded use of distributed energy resources can also contribute introduction of surges into the system.	Potential savings through protection of sensitive electronics during a surge event.
2020 Multiple Sections	New requirements throughout the Code address whether equipment is permitted to be reconditioned.	Improves product safety and increases design options.
2020 NEC Article 242	A new article addresses installation requirements for Surge-Protective Devices and Surge Arrestors used to achieve this protection.	Requirements for this equipment was previously located in two separate Articles. Consolidating into one Article enhances usability of the *Code.*
2020 Article 625	Sets requirements for electric vehicles (EVs) and supply equipment to encompass bidirectional current exchange.	Enhances safety and increases design options utilizing EVs for energy storage
2020 Articles 690, 691, 706, 710 & 712	Requirements supporting new and expanding technologies including Solar Photovoltaic (PV) Systems, Large-Scale Photovoltaic (PV), Electric Supply Stations, Energy Storage Systems, Standalone Systems and Direct-Current Micro-grids.	Immeasurable societal benefits at both the micro- and macro-economic levels.
2017 Article 425	New article addresses installation requirements for fixed industrial process heating employing electric resistance or electrode heating technology.	The previous code did not adequately address installation requirements for this type of equipment. Requirements will enhance safety and eliminate confusion that could impede cost-effective installation.

2017 Article 691	Large-Scale Photovoltaic (PV) Electric Supply Stations - new article addresses requirements for large scale PV systems of no less than 5000 kW that are used to deliver power back to the utility grid.	May contribute to stabilizing electric prices and keeping them low over time.

Keeping the regulatory document current with industry trends in new technology and delivery and generation of electric power.

NEC Edition/Section	Summary of Change	Fiscal Impact
2017 Article 706	New article to cover installation requirements for energy storage systems. The current state of energy storage technology, which includes batteries, and the anticipated evolution of energy storage supports the need for a singular set of requirements in the NEC covering such systems.	Can reduce electricity bills and provide for more robust and resilient electrical infrastructure.
2017 Article 710	New article to address requirements for electric power production sources operating in a stand-alone mode independent of an electrical production and distribution network.	Also, will help reduce electricity bills and promote robust and resilient electrical infrastructure.
2017 Article 712	New requirements to address micro-grids as they are becoming popular to increase energy efficiency, reduce costs, and maintain critical business continuity.	Powering utilization equipment directly from DC sources without intervening DC-AC and AC-DC conversion steps leads to higher efficiencies and potentially smaller, lower-cost equipment than AC-coupled methods.
2014/2017 Article 690	Requirements covering the expanding use of solar photovoltaic power. This enhances first responder safety when performing operations on a roof by establishing a boundary creating two areas of rapid shutdown protection, providing separate requirements for protection inside and outside of the boundary, and specifying performance requirements for the rapid shutdown equipment inside and outside the boundary.	Increased safety for fire fighters and first responders.
2017 Article 625	Amended requirements for including wireless charging technology installation requirements for electrical vehicles.	Increases design options and promotes safe implementation.
2014 Multiple Sections	Revisions that change the voltage thresholds from 600 to 1000 volts in recognition of commonly used alternative energy systems that operate at more than 600 volts.	Revised equipment voltage ratings within product standards that accommodate higher operating voltages of systems such as PV and wind power can lead to more cost-effective installation.

Keeping the regulatory document current with industry trends in new technology and delivery and generation of electric power.

NEC Edition/Section	Summary of Change	Fiscal Impact
2011/2014 Article 694	Introduced in the 2011 NEC for small wind electrical systems, the Article scope has been revised to apply to all wind systems, ensuring that regardless of size, minimum electrical safety requirements are in place.	May contribute to stabilizing electric prices and keeping them low over time.
2014 Article 646	A new article for Modular Data Centers. These new systems are becoming prominent in the demand for business systems to meet a 100% up-time-for-business continuity.	Provides for a more robust and resilient electrical infrastructure, producing cost savings by eliminating down-time.
2014 Article 393	New article and installation requirements for Low Voltage Suspended Ceiling Power Distribution Systems	Increases design options and promotes safe implementation.
2014 Articles 410 & 600	Extensive upgrades are underway to achieve greater energy efficiency in signs and luminaires by replacing in-place illumination systems with LEDs. New requirements ensure that "retro fit kits" employed meet minimum product safety standards through listing requirements.	Reduces lighting loads which may contribute to cost savings.
2014 Article 750	A new article that provides requirements to cover loads where continuity of power cannot be compromised or where automatic disconnection creates a hazard for the public such as shutting off emergency circuits.	Increases safety and design options.
2014 Article 625	New and revised requirements covering electric vehicle charging equipment that keeps the regulatory document in step with the increase in consumer demand for all-electric and hybrid- electric vehicles. New provisions that allow an automatic load management system.	Potential cost savings on sizing of service and feeders.
2011 Article 840	New Article includes requirements for equipment associated with premises-powered broadband communication systems.	Increases design options and promotes safe implementation.
2011 Article 399	With the advent of more customer owned medium and high voltage systems, revisions add requirements for outdoor overhead conductors over 600 volts.	Increases safety and design options.
2011 Article 645	Extensive revisions to provide greater flexibility with design for information technology equipment installations.	Increases design options and opportunity for reduced installation costs.

Examples of new and revised requirements that may reduce the overall cost of the electrical system.

NEC Edition/Section	Summary of Change	Fiscal Impact
2020 210.11(C)(3) & (4)	This revision specifies which receptacle outlets are required to be on the required 20 ampere circuit for bathrooms and garages, thus providing more flexibility with circuiting in those areas.	Provides additional design options that can reduce installation costs.
2014/2017/2020 Article 220	Several revisions to this article, including the modernization of the tables currently in use for calculations, which has been extensively revised to reflect improvements in energy efficiency.	May provide relief for sizing of service and feeder distribution systems.
2020 225.30(B)	Revised to permit multiple smaller feeders, with smaller conductors and lower rated overcurrent protective devices to allow more flexibility with the design.	Provides additional design options that can reduce installation costs.
2020 250.104(A)(1)	Revised to provide relief with the maximum sized bonding jumper for bonding metal water piping systems.	Reduced installation costs.
2017 Table 310.15(B)(3)(c)	This removes the required temperature adder for ambient temperature adjustment correction when calculating size of conductors installed on rooftops exposed to sunlight unless conductors are installed 7/8" or closer to the roof.	Reduced in installation costs.
2017 310.15(B)(7)	Expands the use of 83% reduction for 3-conductor feeders (2 ungrounded and a neutral) derived from either single or three phase supplies.	Potential reduction in cost due to sizing smaller feeders.
2017 338.10(B)(4)	Revised to only require cables with 10 AWG and smaller conductors to default to the 60 degree C ampacity when installed in insulation.	Potential reduction in cost due to sizing smaller conductors.
2017 210.8	New language covering all GFCI requirements that involve a measurement to determine receptacle proximity.	Prescriptive requirement provides clarity on how to determine applicability of the rule.
2017 210.52(B)(1)	Revision to expand permitted appliances in rooms or areas required to be supplied by a 20-ampere small appliance branch circuit to be supplied from an individual branch circuit rated 15 amperes or greater.	Provides greater design flexibility by permitting smaller rated circuits which may be a cost savings.
2017 210.64	Revised to only require a receptacle for service equipment located indoors and a new exception for services rated more than 120 volts-to-ground that supply certain types of equipment.	Eliminating receptacle for outdoor service equipment creates cost savings.

Protecting electrical workers who maintain or service electrical or electrically powered equipment.

NEC Edition/Section	Summary of Change	Fiscal Impact
2020 110.26(C)(3)	Changes to revise working space requirements for non-dwelling unit large electrical equipment installations.	Increased safety for electrical workers potentially avoids down-time due to injuries.
2020 230.62(C)	A new requirement that provides additional shock protection with barriers to be placed in service equipment to prevent inadvertent contact.	Increased safety for electrical workers potentially avoids down-time due to injuries.
2020 230.71(B)	Current requirements for service disconnecting means is revised by eliminating risk from the inability to establish electrically safe conditions for energized work that must be performed within service equipment enclosures with more than one service disconnect.	Increased safety for electrical workers potentially avoids down-time due to injuries.
2014/2017/2020 240.67 & 240.87	Requirements to provide a method for reducing incident energy circuit breakers and fuses rated 1200 amperes and greater. Revisions each cycle expanded and revised the arc energy reduction methods.	Increased safety for electrical workers potentially avoids down-time due to injuries.
2020 408.18(C)	New requirement for manufacturers to provide a label on the front of equipment when working space is required for rear or side access to the equipment.	Increased safety for electrical workers potentially avoids down-time due to injuries.
2017 110.16	Revision to require additional marking requirements for non-dwelling unit service equipment rated 1200 amperes or more	Increased safety for electrical workers potentially avoids down-time due to injuries.
2017 110.26	New requirements that include working space for equipment located in a space that has limited access.	Increases safety for electrical workers potentially avoids down-time by avoiding injuries. Provides flexibility in placement of equipment in these spaces.
2017 409.22, 620.51 & 670.5	New requirements for marking equipment with the short circuit current and maximum available fault current for elevators, industrial machinery, and industrial control panels.	Increases safety for electrical workers potentially avoids down-time by reducing injuries.
2017 404.22	New requirements for electronic lighting control switches to prohibit the introduction of current on the equipment grounding conductor during normal operation.	Increased safety for electrical workers potentially avoids down-time by reducing injuries.

Protecting electrical workers who maintain or service electrical or electrically powered equipment.

NEC Edition/Section	Summary of Change	Fiscal Impact
2017 408.3	New provision that requires barriers for panelboards to provide a measure of safety against inadvertent contact with line-energized parts during maintenance and installation of new feeders or branch circuits	Increased safety for electrical workers potentially avoids down-time by avoiding injuries.
2017 670.6 & 695.15	New requirement for surge protection for industrial machinery and fire pump controllers.	Increased safety for electrical workers potentially avoids down-time by reducing injuries.
2014 110.25	New requirement that provides uniform conditions for locking off switches that control power to equipment to ensure that electrical workers can service and maintain equipment safely. This correlates with federal occupational health and safety regulations covering safe work practices on and about electrical equipment.	Increased safety for electrical workers potentially avoiding down-time by preventing injuries.
2014 110.26	Revisions to egress door requirements to address worker safety in the event of an arc flash or arc blast incident.	Increased safety for electrical workers potentially avoids down-time by preventing injuries.
2014 110.21	Revised to provide uniform hazard marking where caution, warning, or danger signs or labels are required by this referenced standard.	Increased safety for electrical workers potentially avoids down-time by reducing injuries.
2011 404.2(C)	New requirement for installation of a grounded conductor at switch locations where lighting loads are controlled.	Increased safety for electrical workers potentially avoids down-time by preventing injuries.
2011 410.130	Requirement to install disconnecting means when ballasts are replaced in existing luminaires.	Increased safety for electrical workers potentially avoidsg down-time by reducing injuries.
2011 110.24	New labeling requirement for service equipment to identify the maximum available fault current.	Increases safety for electrical workers potentially avoids down-time by reducing injuries.

Protecting people from electric shock in homes, workplaces, and places of recreation.

NEC Edition/Section	Summary of Change	Fiscal Impact
2011/2014/2017/2020 210.8	New requirements applicable to ground-fault circuit interrupter (GFCIs) expand the protection across additional uses and occupancies not addressed in previous editions of the NEC. First introduced in the early 1970s, their continued expansion to areas in homes and workplaces where occupants are particularly susceptible to electric shock accidents is directly related to reductions in electrocutions and electric shock accidents. This further enhances public safety and protection of life.	The US Consumer Product Safety Commission (US CPSC) conducted a cost/benefit analysis of a proposal for additional GFCIs in new residential installations.[1] As reflected in this study, the expected benefits would be a reduction of societal costs associated with residential electrocutions, which translates to the benefit of this life-saving technology being greater than the initial upfront cost.
2020 Article 555	Revision to add "floating buildings" (previously Article 553) to the scope of Article 555 and revised to provide greater flexibility regarding the application of ground-fault protection requirements.	Provides additional design options.
2017 Article 555	Revision to add boatyards and commercial and noncommercial docking facilities to the scope of Article 555 and to lower the ground-fault protection threshold to a maximum 30 mA.	Increases safety to prevent electric shock drowning.
2017 Article 680 Part VIII	New series of requirements covering the certification, marking, protection, and field installation of "electrically powered pool lifts."	With the mandate to provide accessible entry for each public and common use swimming pool as prescribed by the *Americans with Disabilities ACT (ADA),* requirements are in place to ensure safe implementation thereof.
2011 555.3	New requirement to provide ground fault protection for the main overcurrent device supplying marinas and boatyards to help prevent electric shock drowning.	These requirements include upfront installation costs, but the benefit ***greatly*** exceeds the cost in the form of reduction of societal costs associated with electric shock drownings. This further enhances public safety and protection of life.
2011 406.12	Expands tamper-resistant receptacle requirements to guest rooms, guest suites, and childcare facilities.	Introduction of these safety devices are based on a 10-year study[2] conducted by the CPSC of 1991 – 2001 National Electronic Injury Surveillance Systems (NEISS) data, which revealed 24,000+ children under 10 years old were treated in emergency rooms

		for incidents related to electrical receptacles – an average of about seven children per day. These findings demonstrate a clear need to protect children from hazards associated with electrical receptacle outlets. Safety far outweighs the initial installation costs.

Protecting homes, dormitories, hotels, motels, patient sleeping rooms in nursing homes and limited-care facilities from fires of electrical origin.

NEC Edition/Section	Summary of Change	Fiscal Impact
2011/2014/2017/2020 210.12	Arc-fault circuit interrupters (AFCIs) are the most advanced technology currently recognized by the NEC for protecting premises against fires resulting from damaged wiring. Revisions to AFCI requirements expand this protection to these occupancies.	The original call in the early 1990s for enhanced branch circuit and cord protection came from the CPSC based on fires attributed to electrical origin. Manufacturers, in concert with Underwriters Laboratories, worked to develop a product and a product standard to address the CPSC concern. The US Fire Administration published a report[3] in May 2019 that shows a decline in the number of fires attributed to electrical malfunction. Data for the 10-year period of 2008 to 2017 reflected a 14% decrease in fires, 19% decrease in deaths, 34% decrease in injuries and 35% decrease in dollar loss. The benefit of reduced deaths and property damage far exceeds the initial minor installation costs.

[1]Consumer Product Safety Commission – *Economic Considerations – GFCIs*

[2]Consumer Product Safety Commission Study

[3]US Fire Administration – *Residential Building Electrical Malfunction Fire Trends (2008-2017)*

If you have questions or would like additional information, contact Mr. Tim McClintock, Midwest Field Representative for the National Electrical Manufacturers Association, at 330- 749-9782 or tim.mcclintock@nema.org.

EXHIBIT E

2012-2021 IMC Code Comparison

Reference from 2021 Publication	Change from Current	
Three Year Update Cycle	Changes are indicated every edition.	Update costs are reduced when updated with the code cycles; when multiple cycles pass, the updates are not marked in the most current book for the editions that are missed. The committee must review all editions to determine all changes that were missed to determine acceptability. Sometimes those sections will be changed again in later editions. Additionally, the code promulgator provides training on the updates at the regular update intervals.
304.1	Guards used as fall protection on roofs.	Allows a permanent fall arrest anchorage connector device to used to satisfy the need for guard rails on low slope roofs, reduces costs and increases safety.
Chapter 4 Ventilation	Numerous changes for ventilation methods and requirements.	Clarifies numerous ambiguous ventilation requirements, applies appropriate new standards for ventilation in multiple occupancies, very applicable in looking back at the pandemic.
Chapter 2	Defines classifications of refrigerants	Adds definitions of refrigerant flammability to include "2L" lower flammability refrigerants.
501.3	Ductless domestic range hoods	Clarifies and gives relief to domestic ductless range hoods to not be required to vent to the outdoors when in compliance with the manufacturer's instructions, streamlines process and reduces installation costs primarily in residential applications.
504	Clothes Dryer Exhausts	Requires clothes dryer exhausts to be sealed to prevent leakage and maintain pressure throughout the duct to assure proper air flow out of the building. Also requires concealed dryer exhaust ducts to be installed without deformation of the duct due to wall cavity constraints. Maintains proper system operation and eliminateds damage.
505.1	Domestic Range Hoods	Allows domestic range hoods over domestic ranges, in certain other occupacies, when the range is used for domestic purposes. Eliminates the need for Type I hoods (commercial duty) in these other occupancies, significant savings in these applications.
505.3	Common Domestic Kitchen Exhaust Systems in Multi-story Applications	Allows a common exhaust system in multi-story construction where it can be difficult to vent systems on each floor. Similar to dryer systems. More aesthetically pleasing and can reduce costs.
506.5.2	Pollution Control Units	Allows installation of pollution control units in kitchen exhaust systems. These units will reduce noxious odors from the exhaust discharge making installation more acceptable in high density areas. Increases site locations for restaurant operations.

506, 507	Grease Ducts and Commercial Kitchen Exhaust Systems	Clarifies grease duct details to eliminate confusing requirements, applications of Type I and Type II hoods and related controls. Helps to eliminate mis-application of equipment and associated change orders.
507.1	Smoker Units Exhaust	Allows smoker units with factory exhaust to use that exhaust system and not require an additional Type I hood provided installation complies with the manufacturer's instructions. Saves the cost of additional hoods.
Table 603.4	Minimum Sheet Metal Thickness for Ducts	Returns the allowance of 30 gauge shet metal as an acceptable material for single dwelling units, removed from code in 2009 and 2012 but consensus of the code was that action lacked justification. Allows for reduced pricing of ductwork in some applications.
603.9	Improved duct sealing required	Requires duct sealant tape on lower pressure ductwork to reduce leakage, improve performance, and reduce operating costs. Allows an exception for low pressure snap lock and button lock ducts located inside the conditioned space. Increased installation cost but more than offset by operational savings.
929	Decorative Alcohol Fuel Burning Appliances	Allows and regulates the installation of decorative alcohol fuel burning appliances, eliminates confusion for these products.
930	High-Volume Large-Diameter Fans	Defines and allows High-Volume Large-Diameter Fans commonly found in large warehouse and distribution centers. Jurisdictions were uncertain of the acceptance of these products, the code now sets forth the mechanism for approval. Benefits the distribution and logistics industries, also found in some large entertainment venues (stadiums & arenas).
1102.3	Refrigerant Access Port Protection	Requires secure closure (locking caps) for refrigerant service ports to stop tampering, theft, and limit ability of abusive inhalation of refrigerants.
Table 1103.1	Refrigerants	Expanded table to include new A2L type refrigerants.
Sections 1107, 1108, 1109, 1110	Refrigerant systems and methods	Seignificant rewrite of these sections to bring refrigerant regulations up to date with new technologies and prepare for lower GWP refrigerants.
Section 1108.3.2.2	Press-Connect Fittings	Allows the use of press-connect fittings that are specially designed for refrigerant use. Reduces installation labor time, speeds up installation, and reduces cost.
Chapter 14	Solar Thermal Systems	Chapter has been edited to clarify these solar energy systems are thermal based and are not intended to regulate the emerging field of solar photovoltaic electrical generation systems.

EXHIBIT F

ASHRAE 90.1-2007 - ASHRAE 90.1-2019 Comparison

Reference from ASHRAE 90.1-2019	Change from Current	Fiscal Impact
4.2.5 Verification, Testing, and Commissioning	**Commissioning required.** Verification or functional performance testing (FPT required for building systems, controls, and the building envelope to confirm compliance.	Yes. Current code requires commissioning of the control system for buildings over 50,000 sq ft and references ASHRAE and NEBB commissioning process documents. Additional service and review requirements; improves quality assurance.
5.4.3.1 Continuous Air Barrier	**Continous air barrier required.** The continuous air barrier shall be designed and installed.	Marginal increase in cost, if any. Standard practice today; improves energy performance significantly.
5.4.3.1.1 Whole-Building Air Leakage	Whole-building pressurization testing shall be conducted in accordance with ASTM E779 or ASTM E1827 by an independent third party.	Yes. Additional service and review requirements; improves quality assurance of construciton, and health of indoor envrionment, durability of construction, and retained property value.
5.4.3.2 Loading Dock Weatherseals	Cargo doors and loading dock doors shall be equipped with weatherseals.	Yes. Offers energy cost savings.
Table 5.5-4 and 5.5-5 (both climate zone 4 and 5)	**Roof insulation increased.** Insulation entirely above deck increases from R-20 to R-30. Attic insulation increases from R-38 to R-49.	Yes. Offers energy cost savings.
Table 5.5-4 and 5.5-5 (both climate zone 4 and 5)	**Above grade wall insulation incrases.** Steel-framed goes from R-13 + R-7.5 c.i. to R-13 + R-10 c.i. for climate zone 5 only.	Yes. Offers energy cost savings.
Table 5.5-4 and 5.5-5 (both climate zone 4 and 5)	**Above grade wall insulation incrases.** Wood-framed: cz4: from R-13 to R-13 + R-3.8 or R-20 cz5: from R-13.0 + R-3.8 c.i. to R-13 + R-7.5 c.i. or R-19 + R-5 ci.i.	Yes. Offers energy cost savings.
Table 5.5-4 and 5.5-5 (both climate zone 4 and 5)	**Below grade wall insulation increases.** cz4: from none to R-7.5. cz5: R-7.5 requirement remains unchanged.	Yes. Offers energy cost savings.
Table 5.5-4 and 5.5-5 (both climate zone 4 and 5)	**Unheated slab-on-grade floor insulation increases.** From none required to R-15 in climate zones 4 and 5.	Yes. Offers energy cost savings.
Table 5.5-4 and 5.5-5 (both climate zone 4 and 5)	**Heated slab-on-grade floor insulation increases.** From R-15 to R-20 in climate zones 4 and 5.	Yes. Offers energy cost savings.
Table 5.5-4 and 5.5-5 (both climate zone 4 and 5)	**Opaue door insulation increases.** Swinging goes from U-0.700 down to U-0.370. Nonswining goes from U-1.500 (cz4) and U-0.500 (cz5) to U-0.310.	Yes. Offers energy cost savings.
Table 5.5-4 and 5.5-5 (both climate zone 4 and 5)	**Vertical glazing changes as follows for climae zone 4:** Nonmetal framing: from U-0.40 to U-0.36 Nonmetal framing: from SHGC-0.40 to SHGC-0.36 Metal framing: from U-0.50 to U-0.36 Metal framing: from SHGC-0.40 to SHGC-0.36 Entrance doors: from U-0.85 to U-0.63 Entrance doors: from SHGC-0.40 to SHGC-0.33	Yes. Offers energy cost savings.
Table 5.5-4 and 5.5-5 (both climate zone 4 and 5)	**Vertical glazing changes as follows for climae zone 5:** Nonmetal framing: from U-0.35 to U-0.36 Nonmetal framing: from SHGC-0.40 to SHGC-0.38 Metal framing: from U-0.45 to U-0.36 Metal framing: from SHGC-0.40 to SHGC-0.38 Entrance doors: from U-0.80 to U-0.63 Entrance doors: from SHGC-0.40 to SHGC-0.33	Yes. Offers energy cost savings.
Table 5.5-4 and 5.5-5 (both climate zone 4 and 5)	**Skylight performance increases.** Climate zones 4 and 5: From mostly U-0.69 to U-0.50 From mostly SHGC-0.49 to SHGC-0.40	Yes. Offers energy cost savings.
6.3.2.c. Criteria: Cooling Efficiency	Revsied coolling efficiency mandatory provisions.	Yes. Offers energy cost savings. Included in manufacturers current product or product lines.
6.3.2.e. Criteria: Heating Efficiency	Revised heating efficiency mandatory provisions.	Yes. Offers energy cost savings. Included in manufacturers current product or product lines.
6.4.1 Equipment Efficiencies, Verification, and Labeling Requirements	Minimum equipment efficiencies updated.	Yes. Offers energy cost savings. Included in manufacturers current product or product lines.
6.4.3.4.3 Damper Leakage	Where outdoor air supply and exhaust/relief dampers are required, must comply with maximum damper leakage.	Yes. Offers energy cost savings.
6.4.3.11 Chilled-Water Plant Monitoring	An additional section requires large chilled water plant monitoring.	Yes. Offers energy cost savings. May streamline municipal energy benchmarking requirements.
6.5.1 Economizers	A cooling system with a cooling capacity of greater than 54,000 Btu/h must have an air economizer or a water economizer.	Yes. Offers energy cost savings.
7.8 Performance Requirements for Water-Heating Equipment	Revised performance requirements for water-heating equiment.	Yes. Offers energy cost savings. Included in manufacturers current product or product lines.

8.4.2 Automatic Receptacle Control	At least 50% of all 125V,15 and 20 amp receptacles in all private offices, conference rooms, rooms used primarily for printing and/or copying functions, break rooms, classrooms, and individual workstations.	Yes. Offers energy cost savings.
8.4.3.1 Electrical Energy Monitoring	Measurement devices shall be installed in new buildings to monitor the electrical energy use.	Yes. Offers energy cost savings. May streamline municipal energy benchmarking requirements.
9.1.2 Lighting Alterations	Lighting power density (LPD) requirements are more stringent.	Yes. Offers energy cost savings. Met by LED manufacturers current product or product lines (at minimal/no added cost).
9.1.3 Installed Lighting Power	The luminaire wattage for all interior and exterior applications are more stringent.	Yes. Offers energy cost savings.
9.2.1 Requirements for All Compliance Paths	Revised lighting systems and equipment.	Yes. Offers energy cost savings.
9.4.1.1 Interior Lighting Controls	Revised lighting controls requirments for various building types.	Yes. Offers energy cost savings.
9.4.1.4 Exterior Lighting Controls	Revised requirements. Photosensors required. Lighting must be off during the day by photosensor.	Yes. Offers energy cost savings.
10.4.3 Elevators	Revised elevator requirements for lighting, ventilation power, and standby mode.	Yes. Offers energy cost savings. Included in manufacturers current product or product lines.
10.4.4 Escalators and Moving Walks	Requirements added since 2007 edition.	Yes. Offers energy cost savings.
10.4.5 Air Curtains	Requirements added since 2007 edition.	Yes. Offers energy cost savings.
10.4.6 Whole-Building Energy Monitoring	Requirements added since 2007 edition.	Yes. Offers energy cost savings.
10.4.7 Pumps (Clean Water Pumps)	Requirements added since 2007 edition.	Yes. Offers energy cost savings.

ASHRAE 90.1-2007 - 2021 IECC Comparison

Reference from ASHRAE 90.1-2019	Change from Current	Fiscal Impact
C402.5.1 Air barriers.	**Continuous air barrier required.** The continuous air barrier shall be designed and installed.	Marginal increase in cost, if any. Standard practice today; improves energy performance significantly.
C402.5.3 Buildling thermal envelope testing.	**Envelope air leakage must be tested and meet performance requirement.** Thermal envelope shall be tested for air leakage in accordance with ASTM E779 or ASTM E1827. Shall not exceed 0.40 cfm/sf.	Yes. Offers energy cost savings.
C402.5.8 Loading dock weather seals.	Cargo doors and loading dock doors shall be equipped with weatherseals.	Yes. Offers energy cost savings.
C402.1.3 Insulation component R-value based method.	**Roof insulation increased.** Insulation entirely above deck increases from R-20 to R-30. Attic insulation increases from R-38 to R-49.	Yes. Offers energy cost savings.
C402.1.3 Insulation component R-value based method.	**Above grade wall insulation incrases.** Steel-framed goes from R-13 + R-7.5 c.i. to R-13 + R-10 c.i. for climate zone 5 only.	Yes. Offers energy cost savings.
C402.1.3 Insulation component R-value based method.	**Above grade wall insulation incrases.** Wood-framed: cz4: from R-13 to R-13 + R-3.8 or R-20 cz5: from R-13.0 + R-3.8 c.i. to R-13 + R-7.5 c.i. or R-20 + R-3.8 ci.i.	Yes. Offers energy cost savings.
C402.1.3 Insulation component R-value based method.	**Below grade wall insulation increases.** cz4: from none to R-7.5. cz5: R-7.5 requirement remains unchanged.	Yes. Offers energy cost savings.
C402.1.3 Insulation component R-value based method.	**Unheated slab-on-grade floor insulation increases.** From none required to R-15 in climate zones 4 and 5.	Yes. Offers energy cost savings.
C402.1.3 Insulation component R-value based method.	**Heated slab-on-grade floor insulation increases.** From R-15 to R-15 peimeter and R-5 full slab for both climate zones 4 and 5.	Yes. Offers energy cost savings.
C402.1.4 Assembly U-factor, C-factor or F-factor-based method.	**Opaue door insulation increases.** Swinging goes from U-0.700 down to U-0.370. Nonswining goes from U-1.500 (cz4) and U-0.500 (cz5) to U-0.310.	Yes. Offers energy cost savings.
C402.4 Fenestration.	**Vertical glazing changes as follows for climae zone 4:** Nonmetal framing: from U-0.40 to U-0.36 Nonmetal framing: from SHGC-0.40 to SHGC-0.36 Metal framing: from U-0.50 to U-0.36 Metal framing: from SHGC-0.40 to SHGC-0.36 Entrance doors: from U-0.85 to U-0.63 Entrance doors: from SHGC-0.40 to SHGC-0.33	Yes. Offers energy cost savings.
C402.4 Fenestration.	**Vertical glazing changes as follows for climae zone 5:** Nonmetal framing: from U-0.35 to U-0.36 Nonmetal framing: from SHGC-0.40 to SHGC-0.38 Metal framing: from U-0.45 to U-0.36 Metal framing: from SHGC-0.40 to SHGC-0.38 Entrance doors: from U-0.80 to U-0.63 Entrance doors: from SHGC-0.40 to SHGC-0.33	Yes. Offers energy cost savings.
C402.4 Fenestration.	**Skylight performance increases.** Climate zones 4 and 5: From mostly U-0.69 to U-0.50 From mostly SHGC-0.49 to SHGC-0.40	Yes. Offers energy cost savings.
C403.3 Heating and cooling euipment efficiencies.	Revsied coolling efficiency mandatory provisions.	Yes. Offers energy cost savings.
C403.4 Heating and cooling system controls.	Revsied coolling efficiency mandatory provisions.	Yes. Offers energy cost savings.
C403.5 Economizers	A cooling system with a cooling capacity of greater than 54,000 Btu/h must have an air economizer or a water economizer.	Yes. Offers energy cost savings.
C403.7.7 Shutoff dampers	Outdoor air intake and exhaust opening and stairway and shaft vents shall be provided with Class 1 motorized dampers. The dampers shall have an air leakage rate not greater than 4 cfm/sf of damper surface area.	Yes. Offers energy cost savings.
C404.2 Service water-heating equipment performance efficiency.	Revised performance requirements for water-heating equiment.	Yes. Offers energy cost savings.
C405.11 Automatic receptacle control.	At least 50% of all 125V,15 and 20 amp receptacles in all private offices, conference rooms, rooms used primarily for printing and/or copying functions, break rooms, classrooms, and individual workstations.	Yes. Offers energy cost savings.
C403.4.1.4 Heated or cooled vestibules.	Requirements regarding the heating system for heated vestibules and air curtains with integral heating.	Yes. Offers energy cost savings.

C403.4.4 Part-load controls. (Hydronic systems greater than or equal to 3000,000 Btu/h.)	Various pump requirements beyond what current energy code calls for.	Yes. Offers energy cost savings.
C405.2.1 Occupant sensor controls.	New requirements versus current energy code.	Yes. Offers energy cost savings.
C405.2.2 Time-swtitch controls.	New requirements versus current energy code.	Yes. Offers energy cost savings.
C405.2.3 Light-reduction controls.	New requirements versus current energy code.	Yes. Offers energy cost savings.
C405.2.4 Daylight-responsive controls.	New requirements versus current energy code.	Yes. Offers energy cost savings.
C405.2.5 Specific application controls.	New requirements versus current energy code.	Yes. Offers energy cost savings.
C405.2.6 Manual controls	New requirements versus current energy code.	Yes. Offers energy cost savings.
C405.2.7 Exterior lighting controls.	Requirements beyond what is in current energy code. Photosensors required. Lighting must be off during the day by photosensor.	Yes. Offers energy cost savings.
C405.3 Interior lighting power requirements.	More stringent requirements than what is in the current energy code regarding interior lighting power allowances.	Yes. Offers energy cost savings.
C405.9.1 Elevator cabs.	Scope of requirements not present in current energy code.	Yes. Offers energy cost savings.
C405.9.2 Escalators and moving walks	Scope of requirements not present in current energy code.	Yes. Offers energy cost savings.
C405.12 Energy monitoring	Scope of requirements not present in current energy code. Monitoring required for 25,000 sf and up.	Yes. Offers energy cost savings. May streamline municipal energy benchmarking requirements.
C408.2 Mechanical systems and service water-heating systems commissioning and completion requirements	**Commissioning required (mechanical and water-heating only).** Registered design professional or approved agency shall provide evidence of commissioning and completion regarding the mechanical systems and service water-heating systems. This includes functional performance testing.	Yes. Current code requires commissioning of the control system for buildings over 50,000 sq ft and references ASHRAE and NEBB commissioning process documents. Additional service and review requirements; improves quality assurance.

EXHIBIT G

Reference from 2021 Publication	Change from Current	Fiscal Impact
Chapter 3		
301.2 Permits	Permit required for new Section 320 (Additive Manufacturing)	no fiscal impact
302.1 Definitions	Definition added for new Section 320 (Additive manufacturing)	no fiscal impact
304.1.3	Combustible Waste- under grandstands & bleachers	no fiscal impact
304.1.3.1 (New)	Combustible Waste- egress w/sprinklers & fire barriers	have fiscal impact
304.3.3	Combustible Waste-changes in exceptions	no fiscal impact
305.5 (New)	Unwanted fire ignitions	no fiscal impact
308.1.6.3 (New)	Open flames-sky lanterns	no fiscal impact
308.4.1	Open flames in R-2s; cannot find change in any	no fiscal impact
309.2	Powered Industrial trucks & equipment, references NFPA 505	no fiscal impact
310.2	Smoking- allows smoking in designated areas of an I-2	no fiscal impact
310.2.1 (New)	Smoking- allows smoking in designated areas of an I-2	no fiscal impact
310.3	Smoking- allows for the international symbol for no smoking	no fiscal impact
310.3.1 (New)	No smoking sign placement in I-2 occupancies	no fiscal impact
310.6	Smoking-suitable ashtrys in designated areas of I-2 occupancy	no fiscal impact
311.2.2	Vacant Premises-fire protection, adds a 3rd exception	no fiscal impact
311.6	Vacant tenants in mall buildings, Item 2 requirement	have fiscal impact
312.3	Vehicle impact protection, clarifies other barriers	no fiscal impact
314.4	Indoor Displays-includes aircraft & vehicle made inoperable	no fiscal impact
315.1	General Storage-addresses the exterior storage of pallets	no fiscal impact
315.3.1	General Storage-ceiling clearance, clarifies storage along walls	no fiscal impact
315.3.3	General Storage-adds Command Centers in w/equipment rooms	no fiscal impact
315.6 (New)	General Storage-in plenum spaces	no fiscal impact
315.7 thru 315.7.7 (New)	General Storage-outside pallets-building & other stack separations	no fiscal impact
Section 317	Deletes "rooftop gardens, adds requirements of load in IBC	no fiscal impact
317.1	Maintenance of landscape roofs	no fiscal impact
317.2	Size of landscape roofs	no fiscal impact
317.3	Clearance around rooftop equipment	no fiscal impact
318.1	Laundry carts-added "E" & "M" occupancies	no fiscal impact
319.1 thru 319.10.3 (New	Mobile Food Vehicles-requirements	some fiscal impact, what are local & state health requirements
320.1 thru 320.2.9	Industrial Additive Manufacturing (3D printing)	have fiscal impact
321.1 thru 4	Outdoor artifical decorative vegetation	have fiscal impact
Chapter 4		
403.3	Group B fire safety plan required >500	neglible
403.2	requires public safety plan in Groups A & E gatherings	neglible
403.5	Group F fire safety plan required >500	neglible
403.6	Group H fire safety plan required	neglible
403.8	Group M fire safety plan required >500	neglible
403.10.2	High-rise buildings require fire safety plan	neglible
404.2.3	Lockdown plans - does not require them, but does specify what must be in them	no impact
403.11.5	fire safety plans required in some high-piled combustible storage	neglible
403.8.2.4	fire safety in surgery rooms in accordance with NFPA 99	no impact - already done by healthcare due to federal standards
Chapter 5		
508.1-508.1.7	additional detailed fire command center specifications	Likely to increase construction costs
510.4.	Technical requirements for responder radio reliability	Likely to increase construction costs
510.4.2.5	System monitoring additional requirements	likely to increase construction costs
Chapter 6		
603.3	Relocation of reference, rewording of text	no impact
603.3	Change in verbage of 605.3 section on working space and clearance to align with the NEC	no impact
603.9	Rewording of 605.9 regarding use of temporary wiring	no impact
604.1	simplification- redirects to applicable chapter in IBC	no impact
605.2	Update to chimneys and vents, correlates to current standards	no impact
608.2	New section for refrigeration permits, relocatedn from 601.2, which was deleted in Indiana amendments	Possible increase due to permit fees if kept in the new code

601.1 to 601.3.1	Splits out the scope covered in this chapter into bullet points and clarifies requirements	No impact
601-606	Reassigning of chapter sections	no impact
603.1.1	Change to 605.7, rewording and clarification	no impact
603.1.1	New Section- may be in conflict with previous note. Change in text for operations at healthcare facilities	No impact
603.2, 603.2.1, 603.2.2	Expansion of 605.1 section, clarification text and moving open connection cite from 605.6	No impact
603.2.1 & 603.2.1	Clarification of the code sections	no impact
603.2.2	Relocation of open box cite	no impact
603.4 to 603.4.4	Clarification of Current 605.4 sections regarding power taps	no impact
603.4 to 603.4.5	Revamp of 605.4 with added language about UL compliance, maintenance and that	No impact
603.4.1.1	New section specific to use of power taps in I-2 and ambulatory care Occupancies	no impact
603.5 and 605.1	Rewording of 605.5 regarding use of extension cords	no impact
604.8.5	New, prohibits storage in elevator cars and equipment rooms	no impact
605.1 to 605.1.1.5	Additional verbage that includes references to IMC	no impact
605.1 to 605.1.6	Rewording of chapter regarding installation of fuel fired appliances	no impact
605.3 entire section	Fuel oil storage requirements. Updated references to IMC and other standards	no impact
605.3.2.1`	Changes standards to require double wall indoor storage tanks for Class II and III liquids.	May increase cost, although double wall tanks are generally used.
605.4 and subsections	Updated language for use of unvented portable fuel fired heaters	no impact
605.8.1	Updates language to specify residential incinerators comply with UL 791	No impact
608.1.2	New section with standards for ammonia based refrigeration systems. Three changes were submitted	no impact
608.2	Permitting requirements for refrigeration systems	Unless this changes current permitting processes, no impact anticipated.
608.1	Update of 606.10 with regard to emergency pressure control. Brings code into consistency with IMC.	Cost reduction
608.12.4	Significant revision of what was previously in 606.12.3, which provides more guidance on the release of ammonia from refrigeration systems in a controlled situation.	Cost reduction
608.17.1	New section for detection and ventilation of refrigerant leaks, correlated to the IMC	no impact
608.17	New section, verbiage on ventilation of refrigeration systems	no impact
610.1 to 610.1.2	New section, but no information provided	Unknown
608	MAJOR REVISION - moved emergency power, power storage and related systems to a new Chapter 12	SEE CHAPTER 12
Chapter 7		
701.1	Scope-changing wording which reflects the changes listed below	no fiscal impact
701.2	unsafe condition to fire-resistive construction identified	no fiscal impact
701.2.1	Hanging displays from fire resistive ceiling tile prohibited	no fiscal impact
701.3	Smoke barriers maintained	no fiscal impact
701.4	Smoke partitions maintained	no fiscal impact
701.5	Materials & systems used for repair shall be maintained	no fiscal impact
701.6	Maintenance-requires owner to inspect annually & repair as needed	no fiscal impact
701.7	Unsafe conditions-required to be repaired or replaced	no fiscal impact
702.1	Definitions, see Chapter 2	no fiscal impact
703.1	Maintaining penerations in fire-resistive rated construction	no fiscal impact
703.2	Unprotected penetrations shall be protected	no fiscal impact
704.1	Maintaining joints & voids in fire-resistive rated construction	no fiscal impact
704.2	Repair of damaged joints & voids	no fiscal impact
705.1	Openings in fire-resistive rated construction shall be protected	no fiscal impact
705.2	Inspection & maintenance of protective openings, NFPA 80 & 105	no fiscal impact
705.2.1	Opening protectives shall be listed & labeled	no fiscal impact
705.2.2	Protective doors shall have signs	no fiscal impact
705.2.3	Hold open devices & closers	no fiscal impact
705.2.4	Swinging fire door operation	no fiscal impact
705.2.5	Maintaining smoke & heat activated doors	no fiscal impact

705.2.6	Testing of horizontal and vertical sliding doors	no fiscal impact
706.1	Protecting duct and air transfer openings	no fiscal impact
706.2	Maintaining duct and air transfer openings NFPA 80 & 105	no fiscal impact
706.3	Unprotective openings shall be protected as required when Bldg. was constructed.	no fiscal impact
Chapter 8		
803.1	Removed exceptions, added materials tested to 803.1.1 and 803.1.2	Not increase the cost of construction
803.1.1	More specific lanuage to include NFPA 286	not increase the cost of construction
803.5.1	Deleted 803.5.1.1	None
803.7	Added to 2015 Facings or Wood Veneers	None
803.5.1.1	Deleted out Method A test protocol	
805.3.2.2, 805.3.2.2.1, 805.3.2.2	Added testing for mattresses	None
806.1.1	Added within ambulatory care facilities to restricted occupancies	Not increase the cost of construction
806.1.4	Added Test method 1 & 2 of NFPA 701/Changed already in IBC	Minimal
806.2, 807.1, 807.1.2, 807.2 807.4.2.2, 2603.5, 3104.2, 3105.4	Changed to reference 807.2-807.5 (combustible decorative material	None
807.1	Re-number to code reference numbers	None
807	Changed to 807.4 added specific lanuage	None
807.2	Changed to 807.5 Removed specific group types, broader lanuage	None
807.4	Changed to 807.5.1 changed to all occupancies	None
807.4.1	Changed to 807.5.2 Reworded and changed reference numbers	none
807.4.2	Changed to 807.5.2.2 removed NPFA 701 reference	none
807.4.2.2	Changed to 807.5.2.3 Changed verbage to places of religious worship	none
807.4.2.3.	Changed to 807.5.2.4 Removed group A from lanuage	none
807.3	Changed to 807.5.3 Reworded	none
807.4.3	Changed to 807.5.3.1 Lanuage update smoke detection to fire alarm	none
807.4.3.1	Changed to 807.5.3.2 Added in corridors	none
807.4.3.2	New addition artwork in classrooms not more then 50%	none
807.5.3.3	Changed to 807.5.4 broader lanuage	none
807.4.4	Changed to 807.5.4.1 Lanuage update smoke detectors to fire alarm	none
807.4.4.1.	Changed to 807.5.4.2 added in coordiors	none
807.4.4.2	New addition Artwork in classrooms not more then 50%	none
807.5.4.3	New addition dormitories in Group R-2	none
807.5.5	New addition Groups I-1 and I-2	none
807.5.6	New addition relocated from 807.1	none
Chapter 9		
901.1-901.4.5	adds language for life safety systems	No impact to construction costs, clarifies language
901.5-901.8	combines life safety systems vs. detailed list of what systems and addresses systems that are out of service	No impact to construction costs, clarifies language and provides an operational option
903.1.1-903.2.9.4	separates out higher hazard areas allowing for targeted sprinkler protection vs. sprinklering an entire building for specified areas and hazards	This is a decrease in construction costs
903.2.1-903.2.1.6	There was a change from 2015 to 2018 that provides a minimum size requirement to a riser room and required permanent lighting to be provided	This would likely be a possible increase
903.3.1.2	addresses fire concerns in R-occupancies in podium construction requiring NFPA 13 systems vs. NFPA 13R systems in buildings over four stories from grade plane or 30 feet above or below fire department access	This would likely be an increase in construction costs
903.3.1.2.2	adds the requirements for additional sprinkler protection for paths of egress.	This would likely be an increase in construction costs
903.3.1.2.3	Requirements for sprinkler protection in attic spaces under certain conditions based on fire department access road requirements from IFC 503	No impact to construction costs, clarifies language
903.3.	There were changes from 2012-2015 and 2015-2018 that provided calrification on where sprinkler protection could be omitted or should be added. There were some additional clarifications offered in 2021	There were some possible savings and some possible increases for the various changes. Overall there would likely be an increase to construction costs
904.13-904.13.2	allow for recirculating fans or exterior vented for domestic cooking equipment per NFPA 96 and allow for ignition resistant burners	savings in venting costs and potential savings in automatic extinguishing costs
905.4.	allows for removal of hose cabinets in certain situations	No change in construction costs, but a savings in maintenance costs
906.1.	allow for portable fire extinguishers to be on a vehicle of personnel visiting a normally unmanned building or structure vs. maintaining them on site	This would be a decrease in construction costs

907.2.1-907.2.3	Manual fire alarm devices were removed from some locations in 2015 and added in some locations in 2018	There was a savings in 2015 and a probable increase in 2018 with an unknown overall impact for the 2021 edition
907.4-907.5.2.1.3.2	additional requirements and clarification for fire alarm signaling and notification devices	this would likely be an increase in construction costs in certain occupancy types
910.3.4	fusible link requirement change for automatic vents	This would be an increase in construction costs
Chapter 10		
No significant revisions	Some general clean-up for clarification	No construction cost impacts
Chapter 11		
1103.5.5	requirement to retrofit some occupancies where certain materials are stored	No cost construction costs, but some possible costs for existing buildings for retrofit or re-working systems
1103.7.5.1, 1103.9	requirement to add CO alarms to certain occupancies	This will likely increase costs of construction
1105.5.4.2.2-1105.5.4.2.5	clean-up language	no impact
1105.6.1	Two means of egress from a smoke compartment	The cost increase is justified by the need to reduce the life safety hazard
Chapter 12		
NEW CHAPTER SINCE 2012 EDITION	Relocates information from Chapter 6	No cost change
Chapter 23		
2305.1.1	adjustment to installation standards	No impact to construction costs, liely a reduction in materiral cost
2306.7.3.1 (2018 update)	additional impact protection	Likely to be an increase to construction costs
2311.5.1-2 (2018 update)	monitoring for LNG and CNG tanks	likely to be an increase to construction costs
other revisions from 2018	clean up and standards clarification	likely to decrease construction costs by reducing material expenses
2303.1, 2304.2.4	location and visibility requirements	likely to be an increase to construction costs
2311.8.	Operational requirements for repair garages	may decrease operational expenses
Chapter 26		
2603.5 (2015 update)	sealing of buildings structures and spaces section to match IBC	no impact
Chapter 27		
2704.2.2.1	table adjustment on allowable quantities	no cost impact
Chapter 28		
2808.3, 2808.3.1, 2808.4	modifies arrangement of materials stored	reduction in cost of construction
Chapter 31		
Significant changes in the 2015 update	documentation, anchoring, clean-up language, etc.	Likely to have some increase to construction costs
Significant changes in the 2018 update	realignment of numbering	no cost impact
Chapter 32		
3206.6.1.1	Allows access doors in existing occupancies to exceed 100 feet	minor cost savings
3206.9.3	limits on dead-end aisles in HPCS	neglible - addressed in design phase
3203.1 - 3203.6	complete reorganization of commodity classification to match NFPA 13	no fiscal impact
3206.7.1	lessens requirements for fire department access doors in HPCS	minor cost savings
3206.7.5	increase fire department access door requirements from 100 to 125 feet	minor cost savings
3206.7.8	requires key box in HPCS	neglible - most HPCS buildings already require key boxes
3206.2 table	removes requirement for 2 hour fire wall in excess of 500K SF HPCS	potential cost savings
3206.9.1.1	Reduces aisle size in sprinkled non-public HPCS to 24"	potential cost savings
Chapter 33		
3306.2	cleaning and purging of flammable gas lines must comply with NFPA 56	moderate fiscal impact
3303.3	adds requirement for daily fire safety inspection	moderate fiscal impact
3304.5.1	requires fire watch for 40+ feet or 50K+ per floor	moderate fiscal impact
Chapter 34		
No changes	No Changes	No impact
Chapter 35		
3504.1.7, 3510.1, 3510.2	alignment with NFPA 326	No cost impact
Chapter 36		
3603.4 in 2015 update, no revision since	Additional options for rubbish containers	reduction in costs
Chapter 37		
New Chapter in 2015 was previously Chapter 52	No revisions	No impact
Chapter 38		
New Chapter in 2018	Establish safety criteria unique to higher education laboratories	Cost increase to construction for additional safety measures
Chapter 39		
New Chapter in 2018	Processing and extrication facilities	No cost

Chapter 50		
5003.8.3.3	Allow creating multiple fire areas with rated separation in order to avoid an H occupancy classification	This reduces costs
Chapter 51		
several changes between 2018 and 2021	varied topics, realignments, product updates and NFPA updates	no cost impact
Chapter 53		
No significant changes	No significant changes	no cost impact
Chapter 55		
Very few changes between 2018 and 2021	varied topics & realignments	no cost impact
Chapter 56		
5604.6.5	additional placarding	Construction cost increase
5606.6-5606.6.9	additional safety measures for commercial reloading	Construction cost increase
Chapter 57		
5707.3.3	language to allow for wider approval areas	Decrease in construction costs
Chapter 58		
Various sections from 2015 and 2018 revisions	Clarification language only	No cost impact
Chapter 61		
6103.2.1.1	Limits the storage of LP tanks without additional ventilation in certain circumstances	This may have a cost increase if additional ventilation poses challenges
Chapter 63		
Chapter 63 revisions	Editorial changes for clarification	no cost impact

EXHIBIT H

2012-2021 IFGC Code Comparison

Reference from 2021 Publication	Change from Current	
Three Year Update Cycle	Changes are indicated every edition.	Update costs are reduced when updated with the code cycles; when multiple cycles pass, the updates are not marked in the most current book for the editions that are missed. The committee must review all editions to determine all changes that were missed to determine acceptability. Sometimes those sections will be changed again in later editions. Additionally, the code promulgator provides training on the updates at the regular update intervals.
307.2	Marking of Condensate Drains	Requires condensate drains to be marked as primary or secondary such that owners would know when to seek service assistance rather than a drain that is perfoming its normal operation.
307.6	Combustion Condensate Pumps	Pumps installed in uninhabitable spaces shall be interconnected to stop the condensate producing device in the event of pump failure. This prevents damage from overflow that can be costly to remediate.
310.1	Bonding of Corrugated Stainless Steel Tubing (CSST)	Sets forth specific requirements for bonding of CSST to eliminate ambiguos interpretations, minimize expense of rework, and protect installed systems.
402.2	Maximum Gas Demand Sizing	Eliminates generic table for approximate gas demands of appliances which has led to undersized installations. Provides for proper sizing and reduces cost overruns.
403.6	Eliminates PVC and CPVC Options	Code change specifically states that PVC and CPVC are not considered suitable for fuel gas. Those materials have a brittle nature which could create hazardous situations should a failure occur. Other plastic piping options remain available in the code.
404.7	Protection of Concealed Piping	Specifically sets out requirements for piping protection in concealed work, black steel pipe does not require protection but other materials must comply with specific requirements and use compliant sheild plates. Protects piping from penetrations when walls or ceilings are enclosed, minimizing rework due to leaks found upon building completion.
413	Residential and Non-Residential Fueling Appliances	Defines and allows compressed natural gas fueling appliances for residential and non-residential applications, motor vehicles that use CNG may become more popular in the market.
503.4, 503.6, 503.8	Plastic Vent Piping	Clarifies that manufacturers of condensing combustion products are responsible to specify the acceptable piping materials, installation, and termination practices for their products and such materials should be in compliance with their certified test methods.

503.5	Exception for Existing Replacements	An exception to the chimney liner requirement was eliminated. This allowed an existing product to be replaced like for like with a new product. This practice has resulted in significant chimney damage, structure damage, and hazardous conditions for occupants, greatly improves safety and eliminates costly masonry repairs.
503.8	Vent termination clearances	Tables and figures have been revised to clarify the many variations for vent terminations based on building configurations, windows, air openings, etc. This is to eliminate confusion for installers and inspectors and allow proper installations, eliminating expensive rework.