



**Philip Sherman**  
*Chair*  
**Designee of the  
Commissioner of  
Safety**

## MEMBERS

**Arthur Guadano**  
Board of Architects

**Jeffrey Trexler, PE**  
Board of Engineers

**Beverly Kowalik, PE**  
Board of Engineers

**Lee F. Carroll, PE**  
Board of Engineers

**Med Kopczyński**  
NH Municipal Association

**Michael Hagan, CFM**  
NH Building Officials  
Association

**Mark Tetreault, Chief**  
NH Assoc. of Fire Chiefs

**Peter Lennon, Fire Marshal,  
Manchester**  
NH Assoc. of Fire Chiefs

**Arthur Rose**  
Associated General Contractors

**Vice-Chair  
John Tuttle**  
NH Home Builders Assoc.

**Michael Soucy**  
NH Department of Energy

**Tedd Evans**  
Mechanical Licensing Board

**Roger Maynard**  
P•FGF•HVAC of NH

**James Grant**  
Bureau of Electrical Safety and  
Licensing

**Vacant**  
Governor's Commission on  
Disability

**William Fraser**  
NH Electrical Contractors  
Business Assoc.

# NEW HAMPSHIRE STATE BUILDING CODE REVIEW BOARD

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## AGENDA

**Regular Meeting**

**Friday, April 8, 2022**

**10:00am – 12:00pm**

Classroom 2, NH Fire Academy

98 Smokey Bear Blvd

Concord, NH 03301

### CALL to ORDER

1. Roll call and declaration of quorum
2. Accept minutes of March 11, 2022 meeting

### OLD BUSINESS

3. 2021 Code Adoption Schedule
4. Committee Reports, other than IECC & Trade Codes

### LEGISLATION

5. Review of pending legislation

### NEW BUSINESS

6. Review of IECC committee report
7. Review of Trade Code (IMC, IPC, ISPSC) committee report

### OTHER BUSINESS

8. If any

### NEXT MEETING

9. Next regular meeting May 13, 2022

Draft – MINUTES

These minutes are DRAFT minutes and are posted to comply with RSA 91-A: 2 The Board has not voted to accept them. Changes may/may not be made prior to their adoption at the next Board meeting.

NEW HAMPSHIRE STATE BUILDING CODE REVIEW BOARD

In-person regular meeting March 11, 2022

**Members Present:**

Philip Sherman, P.E., Chair  
Roger Maynard, P•FGF•HVAC of NH  
Michael Hagan, CFM, NH Building Officials Association  
Tedd Evans, Mechanical Licensing Board  
Lee F. Carroll, PE, NH Board of Engineers (Electrical Engineer)  
Med Kopczynski, NH Municipal Association  
John Tuttle, Vice-Chair, NH Home Builders Association  
Arthur Rose, Associated General Contractors of NH, Inc.  
Jeffrey Trexler, Board of Engineers (Structural Engineer)  
Michael Soucy, NH Public Utilities Commission  
James Grant, Electricians Board  
Art Guadano, Board of Architects  
Peter Lennon, Fire Marshal - Manchester, NH Association of Fire Chiefs  
William Fraser, NH Electrical Contractors Business Association  
Beverly Kowalik, P.E. Mechanical Engineer

**Absent:**

Mark Tetreault, Fire Chief, NH Association of Fire Chiefs  
Robert Wentworth (Michael Hagan Alternate), NH Building Officials Association  
Mariellen MacKay, Governor's Commission on Disability

**Also Present:**

Erica Webb, Administrative Supervisor NH State Fire Marshal's Office  
Michael Grandy, Assistant Attorney General  
Dean Sotirakopoulos (James Grant alternate), Electricians Board

**Guests:**

Joe LeSage OPLC

The meeting, held in-person, was called to order at 10:00am by Chair Sherman. Chair Philip Sherman proceeded with roll call. A quorum was declared.

**Motion** to accept the meeting minutes from February 11, 2022: Lee Carroll

**Seconded:** Michael Hagan

**Abstained:** James Grant, Art Guadano, William Frasier, and Peter Lennon.

No one opposed, Motion Carried

### **OLD BUSINESS**

**Adoption Schedule:** The Chair opened the meeting with a discussion regarding the adoption schedule for the 2018/2021 codes due to the delay caused by COVID. Some options mentioned were adopting the upcoming 2018 code for 1 year then adopting the 2021 code directly the following year or adopting the 2018 code for 2 years followed by the 2021 code for two years. The goal is to make up for the delay that COVID caused and to work towards getting the BCRB onto a three year cycle which will match up with other codes such as the NEC and legislative scheduling. Discussion among the board included federal requirements for aid in the case of emergencies, Insurance ISO scores, cost of books needing to be purchased by trades groups, federal energy certification, and reciprocal licensing between states. Chair Sherman advised board members to reach out to their constituents and try to get an official letter voicing their support of one schedule or the other so that the BCRB could move toward a plan which could be defended in front of legislatures as to who and why the BCRB supported which ever adoption schedule was ultimately decided on.

**Committee Reports:** The Chair advised that the committee handling the IPC/ISPSC/IMC has reviewed the related IRC portions, and that the IRC committee should also take their findings into consideration so as to maintain consistency between the codes. Likewise, the IRC committee should consider the IECC committee findings on the residential portions of the IECC.

**Cost Analysis:** Chair Sherman brought up for discussion among the board how the BCRB is intended to communicate the “cost” determination as directed by the legislature. Several members of the board suggested that the BCRB request clarification from the legislatures as to what type of cost indicator they are looking for. The Assistant AG, Michael Grandy advised that it was his opinion that the legislation may have intentionally used vague language in order to enable the BCRB to interpret “cost” for themselves.

### **Legislation:**

HB 1681 - Related to the adoption of the 2018 codes and the ratifying of the accompanying amendments. This bill is considered “ought to pass” and includes the 6 month grace period where contractors and architects are able to choose between the incoming code or outgoing code to use during a project being constructed during those 6 months.

SB 398 – Related to the elimination of the Joint Fire Code Committee and the creation of a legislative committee, and includes similarities to HB 1681 including the 6 month grace period.

SB 443 – Related to the involvement in the BCRB in reviewing municipalities amendments. This bill has passed through the NH Senate and is now in awaiting consideration by the NH House. This bill was passed by the NH Senate with the amendments the BCRB put forward following the BCRB’s February Meeting.

HB 1312 – Relative to the DES rules not being more restrictive than the International Plumbing Code rules, as adopted by the state building code. This bill has moved on to an Interim Study which the Chair thought might be considered sometime this summer.

HB 1014 – Relative to remote meetings. Inexpedient to Legislate, with minority report.

HB 1033 – Relative to Lobbying. Out of committee as Ought to Pass. The Chair advised BCRB members to work with their respective organizations and voice their concerns to their legislators.

HB 1068 – Relative to Tiny Homes. Has been found to be inexpedient to legislate, but is expected to return at a later time. Need to keep track of this, as pro tiny home organizations are focusing on zoning more than codes.

**Reference Codes:** Chair Sherman is working to put together reference page which will be used to make sure that anyone using the NH State Building Code is aware of any complimentary codes or appendices they need to also consult rather than the BCRB attempting to modify or input any necessary references into multiple places in the code.

Meeting was adjourned at 11:15am.

Next meeting is scheduled for April 8, 2022 and will be held at the NH State Fire Academy.

**MEETING ADJOURNED**

# Report to the Building Code Review Board: 2021 International Energy Conservation Code

## Recommendations (s)---Possible

### 1) Motion one...

- That the 2018 IECC as adopted by the New Hampshire Legislature remain in effect until the new ICC Energy Standard (sometimes referred to as the 2024 IECC Commercial and the 2024 IECC Residential) is published and can be reviewed.
- That the 2021 IECC be available for adoption by local government as a stretch code amendment.
- That the 2018 International Green Construction code and/or ASHRAE 189.1 be available for adoption as a further stretch code.

### 2) Motion two...

- That legislature adopt the 2021 IECC as one of the model codes adopted as the New Hampshire State Building Code and report compliance to Congress through the Department of Energy (DOE).

### 3) Motion three...

- That legislature adopt the 2021 IECC as one of the model codes adopted as the New Hampshire State Building Code with an effective date of July 2024.

## Genesis:

The purpose of this review by the IECC review committee of the Building Code Review Board is to fulfill the statutory requirement to provide a summary of all significant changes, cost estimates of these changes, and documentation of the need for the change in the recommended legislation. And the State of New Hampshire must certify by July 28, 2023 (42 U.S.C. 6833) that the adopted New Hampshire Energy Code is equivalent to the latest edition of ASHRAE Standard 90.1 (for commercial and multi-family high-rise residential buildings) or the latest version of the International Energy Conservation Code (for low-rise residential buildings). The 2018 IECC is not equivalent to the 2021 IECC or to the latest edition of ASHRAE Standard 90.1. **Adoption of the 2021 IECC will meet this requirement as DOE considers the optional use of ASHRAE Standard 90.1 for the commercial portion of the IECC as meeting this requirement and it is our understanding that many “commercial” projects are designed to ASHRAE Standard 90.1.**

## Summary of Significant Code Changes- 2021 International Energy Conservation Code

The IECC review committee reviewed 62 code changes that the International Code Council identified as significant. Many of these code changes would if adopted have a cost impact.

This committee and in fact the Building Code Review Board is not equipped and does not have any budget or mechanism to analyze these costs in detail. We are a dedicated group of volunteers with knowledge of codes and construction. As we looked at the proposed changes, we did note whether or not there was an apparent first cost increase, (most changes would likely have an increased first cost).

### **Estimated Costs- 2021 International Energy Conservation Code**

Perhaps unique to the energy code, there really are three separate costs to be evaluated. These include first cost, the potential savings for energy (often referred to as life cycle cost), and the societal cost. The first cost, would be an estimate of what the additional requirement would cost during construction. The potential savings would be an estimate of the energy cost savings based on the type of building with the new improved code. The third cost, the Societal Coast, is considered to be the impact that the new energy code has on the environment, the impacts of which society eventually has to pay for (ie: impact from damage caused by more severe weather events).

The added expense of the new energy code requirements is also believed to add financial savings for the building owner or tenet that is paying for the energy used in that building. This cost savings can be immediate and over the life cycle of the building.

In addition to the first cost and energy savings, there is what is termed as Societal Benefits when speaking of energy codes and these are thought to be a major benefit of energy codes. According to the Department of Energy (DOE) it is estimated that by 2060, the world will add 2.5 trillion square feet of buildings, an area equal to the current building stock. As a building's operation and environmental impact is largely determined by upfront decisions, energy codes present a unique opportunity to assure savings through efficient building design, technologies, and construction practices. Once a building is constructed, it is significantly more expensive to achieve higher efficiency levels through later modifications and retrofits. Energy codes ensure that a building's energy use and impact on the environment is included as a fundamental part of the design and construction process. Making this early investment in energy efficiency will pay dividends to residents of New Hampshire for years into the future. The urban built environment is responsible for 75% of annual global greenhouse gas (GHG) emissions while buildings alone account for 39%.<sup>2</sup> While carbon dioxide emissions represent the largest share of greenhouse gas emissions, building electricity use and on-site fossil fuel consumption also contribute to other emissions, two of which, methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O), are significant greenhouse gases in their own right.

There are multiple studies on the impacts of the new requirements in the 2021 IECC that are included in our review. These studies may include analysis on all three-cost discussed above. However, there is conflicting information when considering the added cost during construction as well as the methodology used. Added to this report are the studies by National Association of Home Builders (Home Innovation Research Labs, Inc. (HIRL)), and the Department of Energy (Pacific Northwest National Labs (PNNL)) as well as an analysis/comparison of the HIRL and PNNL by ICF-International that question the validity of the study conducted by HIRL.

The Committee also discussed the potential impact of additional first costs on affordable housing. It was pointed out the developer (and owner in the case of rental "projects") does not reap the benefit of the potential savings in energy costs, but the renter does. The legislature should consider mechanisms that would incentivize the developer in some manner to help recoup some of the first costs. This would be important for any project where there are tax dollars paid for the development and for the ongoing costs of ownership including energy.

## 2021 Revised Workforce Housing Purchase and Rent Limits, [RSA 674:58 - 61](#)

This is an update to information that New Hampshire Housing provided to the Legislature in 2008 as it deliberated on the Workforce Housing statute. The purpose of this table is to assist municipalities in implementing the NH Workforce Housing statute, RSA 674:58 - 61. This analysis incorporates statutory requirements, and includes reasonable market assumptions for the targeted households' income levels such as interest rate, down payment, mortgage term, taxes, and insurance. Please note that this table provides information about the estimated affordable amounts for purchase and rent.

### Ownership

### Renters

80% of 2021 HUD Median Area  
Income Family of four

100% of 2021 HUD Median Area  
Income Family of four

60% of 2021 HUD Median  
Area Income Adjusted for a  
family of three

Recommended Initial Purchase Price for  
**Workforce Housing**

Recommended Maximum Purchase Price for  
**Workforce Housing**

Estimated

Estimated

Estimated  
Maximum

Income **Affordable**  
Purchase Price <sup>1</sup>

Income **Affordable**  
Purchase Price <sup>1</sup>

Income **Affordable**  
Monthly Rent <sub>2</sub>

#### HUD Metropolitan Fair Market Rent Areas (HMFA):

	80% of 2021 HUD Median Area Income Family of four	100% of 2021 HUD Median Area Income Family of four	60% of 2021 HUD Median Area Income Adjusted for a family of three
Hillsborough Co. NH (Part)	\$78,400	\$290,500	\$98,000
Manchester, NH	\$71,440	\$285,500	\$89,300
Nashua, NH	\$87,680	\$342,500	\$109,600
Portsmouth-Rochester, NH	\$85,280	\$338,500	\$106,600
Western Rockingham Co, NH	\$92,000	\$372,500	\$115,000

#### County Fair Market Rent Areas (Non Metro):

	80% of 2021 HUD Median Area Income Family of four	100% of 2021 HUD Median Area Income Family of four	60% of 2021 HUD Median Area Income Adjusted for a family of three
Belknap County	\$69,200	\$287,500	\$86,500
Carroll County	\$60,000	\$267,500	\$75,000
Cheshire County	\$67,200	\$242,500	\$84,000
Coos County	\$50,960	\$196,000	\$63,700
Grafton County	\$69,920	\$279,000	\$87,400
Merrimack County	\$77,360	\$296,000	\$96,700
Sullivan County	\$62,000	\$224,500	\$77,500

<sup>1</sup> Estimated maximum price using 30% of income, 5% down payment, 30 year mortgage at 2.88%, 0.7 points, PMI, estimated 2021 taxes for each area. Interest rate is the average of the 30 Year Freddie Mac interest rate for January-March 2021.

<sup>2</sup> Estimated maximum gross monthly rental cost (rent + utilities), using 30% of income.

## Summary of Significant Code Changes- 2021 International Energy Conservation Code

**Commercial- COMMERCIAL BUILDING.** For this code, all buildings that are not included in the definition of “*Residential building.*”

Chapter 1: Administration				
Code Section		Section Title	Cost	Description of Change
2021	2018			
C103.1	NA	Digital Plans	Null	Allows submittal of digital plans
C103.3	C 103.2	Document Information	Minor	Requires as part of the permit submittal energy compliance path and air sealing details including the location of the air barrier.

Chapter 2: Definitions				
Code Section		Section Title	Cost	Description of Change
2021	2018			
C 202	NA	Def- Bio Gas and Biomass	Null	Adds definitions
		Def- On-Site Renewable	Null	
		Def- Fan Efficiencies	Null	

Chapter 3: General Requirements				
Code Section		Section Title	Cost	Description of Change
2021	2018			
C 301.3	C 301.3	Climate Zone Definitions	–	The climate zone provisions in Chapter 3, from Section C301.3 through the climate zone tables and map, have undergone a significant update. This update corresponds with ASHRAE Standard 169-2013, which is referenced in the 2018 International Green Construction Code® (IgCC®), NSI/ASHRAE/IES Standard 90.1 – Energy Standard for Buildings Except Low-Rise Residential Buildings (ASHRAE 90.1) and ANSI/ASHRAE/IES Standard 90.2 – Energy-Efficient



				Design of Low-Rise Residential Buildings (ASHRAE 90.2). Changes to climate zones for NH- one change reduction for Merrimack County.
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Chapters 4 and 5: Energy Efficiency Requirements				
Code Section		Section Title	Cost	Description of Change
2021	2018			
C 401.2	NA	Compliance Paths	Null	Compliance path options for the commercial provisions of the IECC are named and the sections required for each option are outlined. Since the 2009 IECC, Section C401.2 has included three options for compliance with the energy code: two IECC compliance options and ASHRAE 90.1. The two IECC options were not named within the code but have commonly been referred to as the prescriptive and performance compliance paths. In the 2012 IECC, the performance compliance option in Section C401.2 required the building energy cost to be less than or equal to 85 percent of the standard reference design. Yet in Section C407, the requirement for the performance path was to have an annual energy cost less than or equal to the annual energy cost of the standard reference design, which led to some confusion among code users.
C 401.3	NA	Envelope Certificate	Slight +	A requirement for the completion of a thermal envelope certificate, which serves as a permanent record of the envelope components installed in the building, is introduced.
C 402	C 402	Envelope	+	Section C402 provides building thermal envelope provisions for commercial buildings, including limitations on air infiltration, or air leakage. The building envelope is important to building energy efficiency. When it is cold outside, heat loss and air leakage through the building envelope add to the heating load. On hot days, solar gains through windows, heat gain through opaque assemblies and the infiltration of hot or humid air contribute to the cooling load. The requirements of Section C402 are intended to reduce these heat gains and losses through the building envelope. Increased envelope efficiency also reduces the initial cost of the mechanical system when the heating and cooling loads of a building are adequately sized,

				<p>which in turn decreases ongoing heating and cooling related utility costs. Additionally, envelope efficiency contributes to the resiliency of a building; for example, a tight building envelope maintains habitable temperatures for longer periods during power outages. The commercial envelope provisions have seen few significant changes since the 2012 IECC. Changes to the 2021 IECC are intended to reduce energy use, the single largest operating expense in commercial buildings, representing approximately one-third of typical operating budgets.</p> <p>These significant changes to the building envelope are addressed in the following sections:</p> <ul style="list-style-type: none"> <li>• Increased insulation requirements</li> <li>• Clarifying language for roof and ceiling assembly insulation</li> <li>• Reduced fenestration <i>U</i>-factors and solar heat gain coefficients (SHGCs), and the elimination of orientation as a factor in these values</li> <li>• Expanded air leakage requirements</li> <li>• New operable openings interlocking requirements</li> </ul>
C402.1.3	C402.1.3	Table R- Values	+	The minimum <i>R</i> -values in Table C402.1.3 are increased to improve the efficiency of the building envelope and to align with ASHRAE 90.1.
C402.1.4	C402.1.4	Table-Insulation and U-Factors	+	The <i>U</i> -factor requirements in Table C402.1.4 are decreased to improve the efficiency of the building envelope and to align with ASHRAE 90.1.
C402.1.4.1 &.2.1	C 402.3	Roof Assembly Insulation	+	Roof insulation requirements are clarified and separated for compliance with either the <i>U</i> -factor or <i>R</i> -value method in Sections C402.1.4.1 and C402.2.1.
Table 402.5	C 402.4	<i>U</i> -Factor and SHGC Requirements	+	Changes to the <i>U</i> -factor and SHGC requirements in Table C402.4 increase the energy efficiency of windows, doors and skylights, and the table is revised to classify SHGC on the operable/fixed properties of the fenestration rather than orientation.
C402.5	C 402.5	Air Leakage	+	In Section C402.5, air leakage requirements are expanded to include requirements for residential and nonresidential air leakage testing and for building envelope performance verification for buildings not tested.

C402.5.11	Na	Operable Openings	+	Large, operable openings such as roll-up doors and windows must now be interlocked with the heating and cooling system.
C 403	C 403	Building Mechanical Systems	+	<p>Section C403 broadly addresses the efficiency, construction and operation of building mechanical systems. Federal regulation establishes energy efficiency standards for many consumer and commercial appliances under the Energy Policy and Conservation Act (EPCA). States are preempted from creating energy efficiency standards for appliances and equipment that are covered by federal law under the EPCA, 42 U.S.C. 6201, et seq.2 Thus, the IECC includes both equipment efficiencies set by the U.S. Department of Energy (DOE) under the EPCA and efficiencies for equipment not covered under federal law. Additional efficiencies are derived from insulated and sealed delivery systems and controls.</p> <p>The 2021 IECC Section C403 is divided into 14 parts:</p> <ul style="list-style-type: none"> <li>• Sections C403.1 and C403.2 address general requirements that are applicable to all building cooling, heating and ventilation systems.</li> <li>• Section C403.3 addresses efficiency requirements for building cooling, heating and ventilation equipment and appliances, turndown requirements for boiler systems and the limitations for hot gas bypass.</li> <li>• Section C403.4 provides the control requirements for building cooling and heating systems, including hydronic systems controls.</li> <li>• Section C403.5 addresses both air- and water-side economizer requirements.</li> <li>• Section C403.6 includes provisions specific to multi-zone systems.</li> <li>• Section C403.7 applies to building ventilation and exhaust systems.</li> <li>• Section C403.8 provides efficiency and control requirements for fans.</li> <li>• Section C403.9 references a standard new to the 2021 IECC for large diameter ceiling fans.</li> <li>• Section C403.10 provides requirements for heat rejection equipment.</li> </ul>

				<ul style="list-style-type: none"> <li>• Section C403.11 applies to refrigerated warehouse coolers, refrigerated warehouse freezers, walk-in coolers, walk-in freezers and refrigerated display cases.</li> <li>• Section C403.12 addresses ductwork construction, insulation and testing as well as piping insulation.</li> <li>• Section C403.13 addresses mechanical systems that provide heat outside the building’s thermal envelope.</li> <li>• Section C403.14 introduces requirements for operable interlocking controls.</li> </ul> <p>Significant changes to the building mechanical systems in the 2021 IECC include:</p> <ul style="list-style-type: none"> <li>• Refined HVAC control requirements</li> <li>• Added requirements for low-capacity ventilation fans</li> <li>• Updated fan efficiency requirements</li> </ul> <p>The 2021 IECC also includes two new sections, Section C403.9 Large diameter ceiling fans, which resulted in subsequent renumbering, and Section C403.14 Operable opening interlocking controls, described in the previous section.</p>
C403.4.2.3	C403.4.2.3	Automatic stop/start	Null	In addition to automatic start controls, HVAC systems with direct digital controls serving individual zones must have automatic stop controls.
C403.8.5	C403.8.3	Fan Efficiency	+	The fan efficiency metric is updated to the Fan Energy Index, providing consistent fan efficiency requirements across the IECC and ASHRAE 90.1 and resulting in a more effective energy savings metric.
C403.8.5	C403.8.5	Low Capacity Ventilation Fans	+	New requirements for low-capacity ventilation fans apply the efficiencies of ventilation fans typical of residential construction to mid-rise residential occupancies and small commercial buildings.
C405	C405	Electrical Power and Lighting Systems	+	Lighting accounts for a significant amount of the energy consumption of a commercial building. Lighting fixtures have seen many advances in technology in recent years and new or improved lighting controls offer opportunities for saving energy without the need to change occupant behavior; together, lighting reductions are automatic and mostly unnoticed. Efficient lighting sources and controls maintain and may even improve interior and exterior illumination. Numerous

				<p>studies suggest that daylighting improves employee satisfaction with working conditions and reduces absenteeism. Careful attention to lighting design and controls benefits building occupants and building owners. The provisions in Section C405 apply to lighting systems in new buildings, additions, tenant finishes, alterations to existing lighting systems and any change in occupancy. Controls and minimum lamp efficiencies are required for interior and exterior lighting systems. Exceptions to the provisions include some historic buildings, the replacement of less than 10 percent of the existing interior luminaires and alterations that do not increase the required lighting power. Significant changes to the electrical power and lighting systems provisions in the 2021 IECC include:</p> <ul style="list-style-type: none"> <li>• Expansion and clarification of lighting control applications</li> <li>• New provisions for plant growth lighting</li> <li>• New provisions for automatic receptacle control</li> <li>• New provisions for metering and monitoring</li> </ul>
C405.2.1.2	C405.2.1.2	Occupant Sensors in warehouses	+	Occupant sensor control functions are updated for warehouse storage areas in Section C405.2.1.2, providing further guidance on how occupant sensors should operate within warehouses.
C405.2.8	NA	Parking Garage Lighting Controls	+	A new provision for lighting in parking garages recognizes parking garages as a unique space and requires such spaces to have either occupant sensors or time-switch controls.
C405.4	NA	Lighting for Plant Growth	+	A provision regulating lighting for plant growth and maintenance has been added to ensure indoor agriculture operations are energy efficient.
C405.11	NA	Automatic Receptacle Control	+	New provisions require at least 50 percent of covered receptacles and 25 percent of branch circuit feeders to be automatically controlled receptacles.
C405.12	NA	Energy Monitoring	+	Energy monitoring requirements are added to measure and retain the intended energy performance of a building.
C406	C406	Additional Efficiency Requirements	+	First introduced in the 2012 IECC, the additional efficiency provisions of Section C406 are required for commercial buildings using the Prescriptive Compliance option. The 2021 IECC includes a substantial

				<p>revision to this section, increasing the number of options, introducing a points-based system and providing a climate zone-specific point value for each option.</p> <p>The additional efficiency options do not take the building above the minimum requirements of the energy code, but instead ensure buildings complying prescriptively achieve the same level of efficiency as the Total Building Performance option. This provides flexibility for the building owner and designer to decide how best to make their building or system more efficient, keeping with the IECC’s original intent of providing flexibility in order to conserve energy in buildings.</p> <p>When complying with the Prescriptive Compliance option, designers may select from 11 points-based additional energy efficiency options that now consider climate zone and occupancy type.</p>
C407	C407	Total Building Performance	+	<p>The Total Building Performance provisions of Section C407 comprise the second energy code compliance option of the IECC. This compliance method uses computer software to predict and compare the annual energy cost of the proposed design to the standard design of the building using the components listed in Table C407.4.1(1). Total Building Performance allows tradeoffs between the building envelope, HVAC systems and lighting systems to achieve an overall building energy conservation result equal to or better than that of the other code compliance paths. The significant change to the Total Building Performance option is the addition of a new, comprehensive table of required provisions.</p>
C407.2	C407.3	Performance Based Comp	+	<p>Code requirements applicable to the Total Building Performance compliance path are outlined in a new, user-friendly table to reduce code application confusion. The proposed design for projects complying with Total Building Performance must have an annual energy cost less than or equal to 85 percent of the standard reference design.</p>

**Appendixes**

Code Section		Section Title	Cost	Description of Change
2021	2018			
CA		Board of Appeals	NA- Not recom mende d	A new Appendix CA provides guidance for establishing a board of appeals, including criteria for membership and instruction for developing rules and procedures
CB 103.7		Electrical energy storage system-ready area.	NA- Not recom mende d	Appendix CB adds a provision for the design and construction of a system-ready area for electrical energy storage.
CC		ZERO ENERGY COMMERCIAL BUILDING PROVISIONS	NA- Not recom mende d	Appendix CC provides a model for states and jurisdictions to require renewable energy systems capable of achieving net zero carbon.

DRAFT

**Residential- RESIDENTIAL BUILDING.** For this code, includes detached one- and two-family dwellings and multiple single family dwellings (townhouses) and *Group R-2*, R-3 and R-4 buildings three stories or less in height above grade plane.

**Chapter 1: Administration**

Code Section		Section Title	Cost	Description of Change
2021	2018			
R 103.1	R 103.1	Digital Plans	Null	Provisions related to energy code documentation clarify that construction documents and supporting data may be submitted digitally.
R 103.2	R 103.2	Information on Construction Documents	Null	The information required on the construction documents has been expanded to include an indication of the energy compliance path used.

**Chapter 2: Definitions**

Code Section		Section Title	Cost	Description of Change
2021	2018			
R 202	R 202	Definition of High-Efficacy Light Sources	Null	The revised definition of high-efficacy light sources increases efficacy to 65 lumens per watt for lamps and 45 lumens per watt for luminaires.
		Definition of Renewable Energy Certificate	Null	A new definition for Renewable Energy Certificate ensures homeowners can provide legal documentation of their ownership of the credits for renewable energy.

**Chapter 3: General Requirement's**

Code Section		Section Title	Cost	Description of Change
2021	2018			
R 303.3	R301	Climate Zone Definitions	-	The climate zone provisions in Chapter 3, from Section C301.3 through the climate zone tables and map, have undergone a significant update. This update corresponds with ASHRAE



				Standard 169-2013, which is referenced in the 2018 International Green Construction Code® (IgCC®), NSI/ASHRAE/IES Standard 90.1 – Energy Standard for Buildings Except Low-Rise Residential Buildings (ASHRAE 90.1) and ANSI/ASHRAE/IES Standard 90.2 – Energy-Efficient Design of Low-Rise Residential Buildings (ASHRAE 90.2). Changes to climate zones for NH- one change reduction for Merrimack County.
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Chapters 4 and 5: Energy Efficiency Requirement's				
Code Section		Section Title	Cost	Description of Change
2021	2018			
R 401.2	R 401.2	Compliance Paths	Null	Compliance path options for the residential provisions of the IECC are named and the sections required for each option are outlined.
R 401.2.1	R401.2	Prescriptive Compliance Option.	Null	The Prescriptive Compliance Option requires compliance with Sections R401 through R404. Beginning in the 2006 IECC, Section R401.2 identified two options for compliance with the technical provisions included in Chapter 4 of the IECC. The options are not formally named within the code but have commonly been referred to as the prescriptive and performance compliance paths. A third compliance path, the Energy Rating Index, was added to the 2015 IECC along with a simplified compliance approach for certain dwelling units located in the equatorial Tropical Region; the latter was not listed with the other compliance paths in Section R401.2. Section R401.2 has been revised to clarify and name the four compliance paths for residential projects. Naming the compliance options (Prescriptive, Total Building Performance, Energy Rating Index and Tropical Climate Region) formalizes the way in which the paths are identified and adds clarity for training, education and new code users. Referring to the four paths as options reinforces that it is the designer's choice as to which path is followed.
R 401.2.2	NA	Total Building Performance Option.	Null	The Total Building Performance Option requires compliance with Section R405
R 401.2.3	NA	Energy Rating Index Option.	Null	The Energy Rating Index (ERI) Option requires compliance with Section R406.

R 401.2.5	NA	Additional energy efficiency.	Null	<p>This section establishes additional requirements applicable to all compliance approaches to achieve additional energy efficiency.</p> <p><b>1.</b> For buildings complying with Section <b>R401.2.1</b>, one of the additional efficiency package options shall be installed according to Section R408.2.</p> <p><b>2.</b> For buildings complying with Section <b>R401.2.2</b>, the building shall meet one of the following:</p> <p><b>2.1.</b> One of the additional efficiency package options in Section R408.2 shall be installed without including such measures in the proposed design under Section R405; or</p> <p><b>2.2.</b> The proposed design of the building under Section R405.3 shall have an annual energy cost that is less than or equal to 95 percent of the annual energy cost of the standard reference design.</p> <p><b>3.</b> For buildings complying with the Energy Rating Index alternative Section <b>R401.2.3</b>, the Energy Rating Index value shall be at least 5 percent less than the Energy Rating Index target specified in Table R406.5.</p> <p><u>The option selected for compliance shall be identified in the certificate required by Section R401.3.</u></p>
R 401.3	R401.3	Certificate	+	<p>Requirements for the certificate are expanded to include the code edition and compliance path for the project as well as information related to photovoltaic systems and Energy Rating Index scores, if applicable.</p>
R 402	R402	Building Envelope	+	<p>Section R402 provides building thermal envelope provisions for residential buildings, including limitations on air infiltration, or air leakage. The building envelope is important to building energy efficiency. When it is cold outside, heat loss and air leakage through the building envelope add to the heating load. On hot days, solar gains through windows, heat gain through opaque assemblies and the infiltration of hot or humid air contribute to the cooling load. The building envelope requirements of Section R402 are intended to reduce these heat gains and losses through the building envelope.</p>

				<p>The residential envelope provisions have seen few changes since the 2012 IECC. Significant changes to the building envelope in the 2021 IECC include:</p> <ul style="list-style-type: none"> <li>• Increased insulation requirements</li> <li>• Reduced fenestration <i>U</i>-factors and solar heat gain coefficients (SHGCs)</li> <li>• Increased air leakage requirements</li> <li>• Revised duct testing requirements.</li> </ul>
R 402.1.2	R402.1.2	Insulation and Fenestration Criteria	+	<p>The assembly <i>U</i>-Factor is established as the primary insulation metric, and <i>R</i>-Value is an alternative. Since the 2006 IECC, <i>R</i>-values have been the primary metric for envelope efficiencies, with assembly <i>U</i>-factors serving as an alternative compliance metric. The 2021 IECC focuses envelope efficiency on <i>U</i>-factors which define the performance of entire assemblies.</p>
Table R 402.1.2	Table R402.1.2	Insulation and Fenestration <i>U</i> -Factors	+	<p>The ceiling and framed wall assembly <i>U</i>-factors in Table R402.1.2 have been decreased. The 2021 IECC increases efficiencies for ceilings, wood frame walls and fenestration. Specifically, the ceiling <i>U</i>-factors for Climate Zones 2 and 3 are decreased to align with the 2018 IECC requirements for Climate Zone 4 and higher; similarly, ceiling <i>U</i>-factors are decreased for <b>Climate Zones 4 through 8, increasing efficiency beyond what was achieved in previous code versions. The <i>U</i>-factor requirements for wood frame walls in Climate Zones 4 and 5 are decreased as well, aligning with the 2018 IECC requirements for Climate Zones 6 through 8.</b> Improved efficiencies in fenestration <i>U</i>-factors for Climate Zones 3 and 4 are also achieved. Finally, SHGC values are copied from the <i>R</i>-value table to the <i>U</i>-factor table, with requirements added for <b>Climate Zone 5 that are consistent with the 2018 IECC requirements for Climate Zone 4 (0.40).</b></p>
Table R 402.1.3	Table R402.1.2	Insulation Minimum <i>R</i> -Values and Fenestration Requirements by Component	+	<p>The <i>R</i>-value table has been restructured and the efficiencies for most components have been increased. Efficiencies are increased for ceilings, wood frame walls, basement walls, crawlspace walls, slabs on grade and fenestration. Ceiling <i>R</i>-value requirements for Climate</p>

				Zones 2 and 3 are increased to align with the 2018 IECC requirements for Climate Zone 4 and higher, and the efficiencies in Climate Zones 4 through 8 are similarly increased. Insulation R-values for wood frame walls increased in Climate Zones 4 and 5, aligning with the 2018 IECC requirements for Climate Zone 6.
R 402.2.8	R402.2.8	Basement Walls	+	Exceptions to the basement walls provision clearly define the characteristics of unconditioned basement. Basement walls are required to comply with the provisions in Table R402.1.3 <b>unless they meet each of the characteristics for unconditioned basements.</b> Previous versions of the energy code did not consider the heat transfer through ducts, stairways, doors and other elements of the basement when defining an unconditioned basement
R 402.4.1.2	R402.4.1.2	Air Leakage Testing	Null	Several significant changes have been made to the testing requirements for residential projects. The maximum air leakage rate is now 5 air changes per hour (ACH) for all compliance paths and 3 ACH for <b>dwelling in Climate Zones 3 through 8 following the Prescriptive compliance path.</b> The air leakage rate for buildings and dwelling units following the Prescriptive compliance path is detailed in the new Section R402.4.1.3. Heated attached and detached garages that are field verified for air barrier and insulation installation criteria in Table R402.4.1.1 are exempt from the testing requirements. An alternative testing metric has been added to the 2021 IECC for attached single and multiple-family dwelling units and smaller homes. <b>While median-sized single-family homes are typically able to achieve the air leakage rate required by the IECC, it can be more difficult for small volume or attached homes to comply.</b> The alternative metric more accurately reflects leakage through the exterior enclosure area which ensures even small volume homes are able to comply with the required air leakage rates.
R 402.5	R402.5	Maximum Fenestration U-Factor and SHGC	Null	Maximum fenestration U-factors have been in the IECC since the 2006 version and serve as a backstop in the event of tradeoffs. Over four code update cycles, from the 2009 IECC through the 2018 IECC,

				prescriptive fenestration efficiencies increased, but the maximum <i>U</i> -factors and SHGCs used for tradeoffs were not updated. To remain consistent with improvements made to the prescriptive fenestration values, maximum fenestration <i>U</i> -factors and SHGCs permitting in the tradeoff compliance options are updated in the 2021 IECC. This provision is applicable to the Prescriptive compliance option where tradeoffs are used and to the Total Building Performance compliance option.
R 403	R403	Systems	Null	<p>Section R403 broadly addresses the efficiency, construction and operation of building mechanical systems that are not regulated by the U.S. Department of Energy. Federal regulation establishes energy efficiency standards for many consumer and commercial appliances under the Energy Policy and Conservation Act (EPCA). States are preempted from creating energy efficiency standards for appliances and equipment that are covered by federal law under EPCA 42 U.S.C. 6201, et seq.1 Thus, the IECC efficiencies related to mechanical systems are achieved with insulated and sealed delivery systems and controls. The 2021 IECC Section R403 is divided into 12 parts.</p> <p><b>These are the significant changes to the building mechanical systems requirements in the 2021 IECC:</b></p> <ul style="list-style-type: none"> <li>• Clarified insulation requirements for ducts located outside of conditioned space, in conditioned space and buried</li> <li>• Expanded duct testing requirements</li> <li>• New mechanical ventilation system testing requirements</li> </ul>
R 403.3	R403	Systems	Null	<p>Section R403.3 includes both structural and technical changes. First, Section R403.3 is reorganized for clarity and application, making it more understandable and usable for field practitioners. From that reorganization, three distinct locations where ductwork can be installed—outside conditioned space, inside conditioned space and buried—are outlined along with the insulation requirements for each. The 2018 IECC fully addressed buried duct provisions and updates to the 2021 IECC offer similar changes for ducts located within the continuous air barrier and building thermal envelope. Section R403.3.2 now lists conditions that must be met for ducts to be</p>

				considered inside a conditioned space. Changes made to this section are intended to increase the energy performance of ductwork within homes.
R 403.3.1- R 403.3.3.1	R 403.3.1- R 403.3.7	Duct Location and Insulation	+	<p>Section R403.3 includes both structural and technical changes. First, Section R403.3 is reorganized for clarity and application, making it more understandable and usable for field practitioners. From that reorganization, three distinct locations where ductwork can be installed—outside conditioned space, inside conditioned space and buried—are outlined along with the insulation requirements for each.</p> <p>The 2018 IECC fully addressed buried duct provisions and updates to the 2021 IECC offer similar changes for ducts located within the continuous air barrier and building thermal envelope. Section R403.3.2 now lists conditions that must be met for ducts to be considered inside a conditioned space. Changes made to this section are intended to increase the energy performance of ductwork within homes.</p> <p>Section R403.3.1 is applicable to all compliance paths except the Tropical Climate Region compliance option. Sections R403.3.2 and R403.3.3 are only applicable to the Prescriptive compliance option.</p>
R 403.3.5	R403.3.3	Duct Testing	+ Check IMC and amendments	<p>Ducts in conditioned spaces are no longer exempt from duct testing requirements and a duct testing standard is specified. The 2021 IECC requires a duct leakage test for all new homes, including homes with all ducts inside conditioned space, mitigating the risk for such callbacks and ensuring ducts are functioning appropriately. Duct leakage rates can be extremely high when ducts are not tested. Without an objective test as a means of quality assurance, even careful builders may not be aware of missed connections or poor sealing.</p>
R 403.6.3	R403.6	Mechanical Ventilation System Testing	+	<p>Mechanical ventilation systems must be tested to ensure they are installed and operating as intended. This new provision requires testing to ensure that the systems are installed in such a way that they work as intended by the code. This provision is applicable to all</p>

				compliance paths except the Tropical Climate Region compliance option.
R 404	R404	Electrical Power and Lighting Systems	+	Lighting uses about 10 percent of residential electrical power. Significant changes to the 2021 IECC electrical power and lighting requirements include both the introduction of exterior lighting requirements for some residential occupancies and controls into the residential provisions.
R 404.1.1	R404.1	Exterior Lighting	+ slight plus but see exceptions	An exterior lighting requirement to comply with Section C405.5 is introduced for select residential buildings. The new Section R404.1.1 directs select residential occupancies to the commercial code and its lighting power density requirements. The section exempts detached one- and two-family residences, solar-powered lighting and any lighting controlled by a motion sensor.
R 404.2	NA	Interior Lighting Controls	+ check on switch issue	Permanently installed lighting fixtures are required to have either a dimmer, occupant sensor or other control unless exempt. Bathrooms, Hallways, Exterior lighting fixtures and Lighting designed for safety or security are exempt.
R 404.3	NA	Exterior Lighting Controls	+	Exterior lighting is required to have a manual on/ off switch that permits automatic shutoff except lighting serving multiple dwelling units. Similar to interior controls, Section R404.3 introduces residential exterior lighting provisions to the IECC. The new section requires controls for systems with greater than 30 watts; these controls must have manual switches that allow automatic shutoff and lighting must automatically shutoff based on daylight.
R 405.2	R405.3	Performance-Based Compliance	Null	Section R405 contains the provisions for the Total Building Performance compliance option. This performance-based option offers flexibility in determining the most cost-effective methods to design a code-compliant structure. Total Building Performance uses software to predict the annual energy use of the proposed design compared to that of the standard design of building components listed in Table R405.4.2(1). The 2021 IECC eliminates the terms mandatory and prescriptive, and instead, all the requirements applicable to the R405 Total Building Performance are located within Section R405. Table R405.2 includes all the required provisions for

				<p>this compliance path. Code users should also note the provision for additional energy efficiency included in section R401.2.5 requires projects complying with the Total Building Performance option to either include one item from Section R408 that is not included in the proposed design, or demonstrate the proposed design annual energy cost is less than or equal to 95 percent of the annual energy cost of the standard reference design. This provision is only applicable to the Total Building Performance compliance option.</p>
R 405.3.2	R405.4.2	Compliance Report	Null	<p>The performance path compliance report is simplified for greater usability and easier enforcement. The Total Building Performance compliance option has seen extensive use in Colorado, Florida and other parts of the country since the 2009 IECC. These provisions are only applicable to the Total Building Performance compliance option.</p>
R 406	R406	Energy Rating Index Compliance Alternative	Null	<p>Section R406 of the IECC contains the provisions for the Energy Rating Index (ERI) compliance option. Introduced in the 2015 IECC, the ERI is another path that can be used to demonstrate compliance with the energy code. The ERI is an index scoring system with a scale that ranges from 0 to 100. A net zero home or residential building will achieve an index value of 0; a home built to minimum requirements of the 2006 IECC is considered the reference design and has an index score of 100. Each point on the scale represents a 1-percent change in the total energy use of the rated design relative to the total energy use of the ERI reference design.</p> <p>The ERI score considers all energy used in the residential building. Significant changes to the 2021 IECC include a restructuring of the section to clarify required provisions (formerly referred to as mandatory), updates to the target ERI scores and the introduction of provisions for renewable energy certificate documentation. the provision for additional energy efficiency included in section R401.2.5 requires projects complying with the ERI to demonstrate the ERI value is at least 5 percent less than the ERI target specified in Table R406.5. This provision is only applicable to the Energy Rating Index compliance option.</p>



R 406.3	R406.4	Building Thermal Envelope	Null	Target ERI scores are lowered and the role of onsite renewables is clarified. Table R406.5 restores the lower ERI target scores from the 2015 IECC. Coupled with the requirements for additional energy efficiency in R401.2.5, which specify projects must reduce the ERI target by at least 5 percent, the 2021 ERI compliance option results in a significantly more efficient building than the 2018 IECC. These provisions are only applicable to the Energy Rating Index compliance option.
R 406.7.3	NA	Renewable Energy Certificate Documentation	Null	Renewable energy certificate (REC) documentation is introduced to ensure homeowners are able to legally document ownership of the RECs associated with their homes. The new section R406.7.3 addresses ownership of the environmental attributes of an on-site renewable energy system. The environmental attributes of solar power and other renewable energy systems have a market value that is reflected and transacted in RECs. This provision ensures the attributes are not double-counted by other entities by requiring legal documentation of ownership. This section is supported by a new definition of renewable energy certificate that provides clarification on what the renewable energy certificate represents. This provision is only applicable to the Energy Rating Index compliance option.
R 408	NA	Additional Efficiency Package Options	+	Residential projects are required to include additional energy efficiency measures as specified by the compliance path option selected. Section R408 outlines the additional energy efficiency package options for the Prescriptive and Total Building Performance paths. Arguably the most significant change to the residential provisions of the 2021 IECC, Section R408 provides five options from which residential projects can choose to demonstrate additional energy efficiency. These improvements increase energy savings and reduce costs to the homeowner over the useful life of the building.

**Appendixes**

Code Section		Section Title	Cost	Description of Change
2021	2018			
RA		Board Of Appeals	NA- Not recom mende d	A new Appendix RA provides guidance for establishing a board of appeals, including criteria for membership and instruction for developing rules and procedures.
RB 103.5		Shading	NA- Not recom mende d	To maximize solar technology effectiveness, Appendix RB defines a minimum setback for the designated solar-ready zone from permanently affixed objects and focuses on roof slopes facing sunward with sufficient slope to maximize energy collection.
RC		Zero Energy Residential Building Provisions	NA- Not recom mende d	Appendix RC provides a model for residential construction to achieve net zero energy consumption through the use of renewable energy systems.

Amendments to the 2018 IECC...			
C 101.0	State Name	<b>EN-21-01-22- Update</b>	Keep
R-101	State Name	<b>EN-21-05-22</b>	Keep
C 101.5	Residential exception	<b>EN-21-02-22</b>	Not needed
C 406	Additional Efficiency Requirements	<b>EN-21-03-22</b>	Not needed
C 408	Commissioning	<b>EN-21-04-22</b>	Not needed
R101.5	Residential Exception	<b>EN-21-06-22</b>	Not needed

### Chapter 3: General Regulations

Code Section		Section Title	Cost	Description of Change
2021	2018			
307.2.1.1 Modification	307.2.1.1 1	Condensate Discharge	N	The term “copper alloy” is used in numerous locations in the code text. The new definition broadly describes the entire range of copper alloy materials that a manufacturer might use for a product.

### Chapter 4: Ventilation

Code Section		Section Title	Cost	Description of Change
2021	2018			
401.2, 403.1 Clarification	401.2, 403.1	Mechanical Ventilation for Dwelling Units	Null	This change clarifies where mechanical ventilation is required for dwelling units. The previous reference to the testing required by Section R402.4.1.2 of the <i>International Energy Conservation Code</i> (IECC) had caused varying interpretations as to whether the testing applied only to R-2 buildings of 3 stories or less or if it applied to all R-2 buildings. The revised text makes no distinction between R-2 buildings of 3 stories or less and R-2 buildings over 3 stories, thereby eliminating multiple interpretations.
401.4, 501.3.1 Modification	401.4, 501.3.1	Intake Opening and Exhaust Outlet Locations	Null	A new type of factory-built combination exhaust and intake air fitting is introduced that does not require separation between the two openings.
403.3.1.1 Clarification	403.3.1.1 1	Recirculation of Mechanical Exhaust Prohibited	Revisit	Note g of Table 403.3.1.1 was rewritten to lessen the negative impact of recirculated exhaust air from spaces such as bath and toilet rooms, shower rooms, locker rooms and certain classrooms, shops and labs.

<b>403.3.1.3</b> Modification	<b>403.3.1.</b> <b>3</b>	<b>Demand Controlled Ventilation</b>	<b>Revisit</b>	The change clarifies that demand control ventilation schemes cannot eliminate all ventilation in a space while that space is expected to be occupied.
<b>403.3.2.1</b> Modification	<b>403.3.2.</b> <b>1</b>	<b>Outdoor Air for Dwelling Units</b>		Because of the superior performance of balanced ventilation systems (see new definition), the code will grant a reduction in the ventilation rate, recognizing the higher efficiency of balanced ventilation systems.
<b>Chapter 5: Exhaust Systems</b>				
<b>Code Section</b>		<b>Section Title</b>	<b>Cost</b>	<b>Description of Change</b>
<b>2021</b>	<b>2018</b>			
<b>502.20</b> Modification	<b>502.20</b>	<b>Manicure and Pedicure Station Exhaust System</b>		The code now requires the continuous operation of nail salon exhaust systems during business hours.
<b>504.4.1</b> Modification	<b>504.4.1</b>	<b>Termination Location for Dryer Exhaust</b>	<b>+</b>	New text was added to address the possibility of dryer exhaust air being reintroduced into a building interior.
<b>506.3.7</b> Modification	<b>506.3.7</b>	<b>Factory-Built Grease Duct Slope</b>	<b>Null/-</b>	The new exception exempts factory-built grease ducts from the duct slope prescriptions of the code, relying instead on the slope requirements stated in the product listing and manufacturer's installation instructions.
<b>507.1</b> Modification	<b>507.1</b>	<b>Smoker Ovens with Integral Exhaust</b>	<b>-</b>	The new exception exempts smoker ovens from the requirement for a Type I hood where such ovens have an integral exhaust system and are listed for installation without a Type I hood.
<b>514.2</b> Modification	<b>514.2</b>	<b>Energy Recovery Ventilation Systems</b>	<b>Null/-</b>	The prohibition of some types of energy recovery ventilation (EVR) equipment for use with Type II kitchen exhaust hoods has been lifted.

<b>Chapter 6: Duct Systems</b>				
<b>Code Section</b>		<b>Section Title</b>	<b>Cost</b>	<b>Description of Change</b>
<b>2021</b>	<b>2018</b>			
<b>602.2.1.8</b> Modification	<b>602.2.1.8</b>	<b>Pipe and Duct Insulation Within Plenums</b>	<b>Null</b>	The revision addresses the practice of using pipe insulation materials to protect piping that does not meet the required fire performance requirements.
<b>607.5.2</b> Modification	<b>607.5.2</b>	<b>Duct Penetrations of Fire Barriers</b>	-	The revision describes how flexible air connectors can be installed in a duct system that is otherwise required to be constructed entirely of sheet steel.
<b>607.5.5</b> Modification	<b>607.5.5</b>	<b>Subducts Penetrating Shaft Enclosures</b>	<b>null</b>	The revision makes Exception 1 consistent with Exception 2 because the requirements for a subduct option for fire dampers should be the same for the subduct option for smoke dampers.
<b>608.1, 403.3.1.5</b> Modification	<b>608.1, 403.3.1.5</b>	<b>Ventilation Air Distribution</b>	<b>Null</b>	This revision relocates text that requires verification of the required ventilation airflow rates by means of balancing the system and adds a requirement for airflow adjustment means for air distribution and exhaust systems, in addition to the previous requirement for ventilation air systems.
<b>Chapter 8: Chimneys and Vents</b>				
<b>Code Section</b>		<b>Section Title</b>	<b>Cost</b>	<b>Description of Change</b>
<b>2021</b>	<b>2018</b>			
<b>801.21</b> Addition	<b>801.21</b>	<b>Blocked Vent Switch for Oil-Fired Appliances</b>	<b>Null</b>	A requirement was added for an additional safety device for oil-fired appliances to be consistent with what is required for some gas-fired appliances.
<b>Chapter 9: Specific Appliances, Fireplaces and Solid Fuel-Burning Equipment</b>				

Code Section		Section Title	Cost	Description of Change
2021	2018			
<b>905.1</b> Modification	<b>905.1</b>	<b>Wood-Burning Residential Hydronic Heaters</b>	+	The revision makes the code consistent with EPA rules for heater emissions.
<b>929</b> Addition	<b>929</b>	<b>Unvented Alcohol Fuel-Burning Decorative Appliances</b>	Null	Coverage was added for a new type of decorative fuel-burning appliance about which the code was previously silent.
<b>Chapter 11: Refrigeration</b>				
Code Section		Section Title	Cost	Description of Change
2021	2018			
<b>1101 through 1108</b> Modification	<b>1101 through 1108</b>	<b>Ammonia Refrigeration Systems</b>	null	These revisions remove all regulations for ammonia refrigeration systems from the IMC and instead simply defer all regulation to the suite of IIAR standards already referenced in the IMC.
<b>1105.9</b> Addition	<b>1105.9</b>	<b>Machinery Room Means of Egress</b>	Null	Revised egress requirements for machinery rooms from the IBC were added to the IMC to prevent such requirements from being overlooked.
<b>1107 through 1110</b> Addition	<b>1107 through 1110</b>	<b>Refrigerant Piping</b>	+	Section 1107, Refrigerant Piping, of the 2018 IMC was deleted entirely and replaced with all new text in Sections 1107 through 1110.

## Chapter 2: Definitions

Code Section		Section Title	Cost	Description of Change
2021	2018			
202 Clarification	202	<b>Definition of Copper Alloy</b>		The term “copper alloy” is used in numerous locations in the code text. The new definition broadly describes the entire range of copper alloy materials that a manufacturer might use for a product.
202 Modification	202	<b>Definition of Public and Private</b>		The definitions of “public” and “private” are simplified to make a clearer distinction as to which plumbing fixtures are intended to be configured for public use.
202 Modification	202	<b>Definition of Water Dispenser</b>		A bottled water unit is no longer defined by the code as a water dispenser.

## Chapter 3: General Regulations

Code Section		Section Title	Cost	Description of Change
2021	2018			
308.9 Modification	308.9	<b>Bundled Hot Water Piping Insulation</b>		Where hot water piping for a manifold system is in a bundle with cold water piping, the hot water piping is required to be insulated but not necessarily individually insulated.

## Chapter 4: Fixtures, Faucets, and Fixture Fittings

Code Section		Section Title	Cost	Description of Change
2021	2018			
403.1.1 Modification	403.1.1	<b>Fixture Quantity Calculations for Multiple User Facilities</b>		The minimum fixture quantities for multipleuser toilet facilities designed to serve all genders must be calculated 100 percent based on total occupant load.

403.2 Modification	403.2	<b>Multiple-user Nonseparated Toilet Facilities</b>	-	Designs for multiple-user facilities serving both sexes are possible.
<b>403.3.1</b> Clarification	<b>403.3.1</b>	<b>Facilities and Drinking Fountains on Accessible Routes</b>	null	Because accessibility is covered by the requirements of Section 404 and those requirements include specifics concerning accessible routes, there is no need to repeat the accessible route requirement in these sections.
<b>403.5</b> Clarification	<b>403.5</b>	<b>Facilities and Drinking Fountains on Accessible Routes</b>		Because accessibility is covered by the requirements of Section 404 and those requirements include specifics concerning accessible routes, there is no need to repeat the accessible route requirement in these sections.
<b>403.3.3</b> Modification	403.3.3	<b>Group S Toilet Facility Location</b>	Null/-	The location of toilet facilities in Group S occupancies can exceed the location and maximum distance limitations provided that the arrangement is approved.
<b>403.6</b> Addition	<b>403.6</b>	<b>Service Sink Location</b>	Null/-	Where a service sink is not located within a tenant space in a covered mall, the travel distance to a service sink is limited.
<b>405.4.3</b> Modification	<b>405.4.3</b>	<b>Wall Hung Fixture Carrier Standard for Water Closets</b>		A new standard for water closet carriers is added.
<b>407.2</b> Modification	<b>407.2</b>	<b>Bathtubs are Not Required to have Overflow Outlets</b>	-	A bathtub does not require an overflow outlet.
<b>410.3.2</b> Addition	<b>410.3.2</b>	<b>Quantities of Standing versus Wheelchair Drinking Fountains</b>	Null	Fifty percent of the required number of drinking fountains must be for standing persons and the other 50 percent for persons who use wheelchairs.
<b>410.4</b> Clarification	<b>410.4</b>	<b>Drinking Fountain Substitution using Water Dispensers</b>	+	At least three required drinking fountains must be installed before 50 percent of the additional required drinking fountains can be substituted with water dispensers.
<b>411.3</b> Modification	<b>411.3</b>	<b>Water Heaters for Emergency Showers and Eye Wash Stations</b>	Null	A new type of water heater is available for emergency showers and eyewash stations that does not require a temperature-actuated mixing valve.
<b>412.3</b> Modification	<b>412.3</b>	<b>Shower Control Valves to be Rated for the Installed Shower Head</b>	Null	Lower flow shower heads need to be compatible with the shower control (mixing valve).
<b>412.5</b> Modification	<b>412.5</b>	<b>Methods for Limiting Water Temperature Discharged to Bathtubs</b>	Need More Info	New types of water heaters and a new design for tub faucets are additional methods that can be used to control water temperature for bathtubs.



<b>412.10</b> Modification	<b>412.10</b>	<b>Methods for Temperature Limitation at Head Shampoo Sinks and Footbaths</b>	Need More Info	Two additional methods can be used to limit the water temperature discharged from a head shampoo sink.
<b>419.5</b> Modification	<b>419.5</b>	<b>Tempered Water for Public Hand-Washing Lavatories</b>	Null	A valve conforming to CSA B125.3 is no longer acceptable as a water-temperature limiting device for public hand-washing lavatories.
<b>421.3.1</b> Addition	<b>421.3.1</b>	<b>Standard for Shower Waste Fittings</b>	Null	Shower drains, including linear shower drains, are required to comply with the referenced standard.
<b>Chapter 5: Water Heaters</b>				
Code Section		Section Title	Cost	Description of Change
2021	2018			
<b>501.2</b> Clarification	<b>501.2</b>	<b>ASSE 1017 Temperature Actuated Mixing Valves</b>	Null	The title of Standard ASSE 1017 is <i>Temperature-Actuated Mixing Valve</i> . Therefore, the code language is changed to align with the title of the standard.
<b>Chapter 6: Water Supply and Distribution</b>				
Code Section		Section Title	Cost	Description of Change
2021	2018			
<b>602.3.5</b> Modification	<b>602.3.5</b>	<b>Potable Water Pumps to Comply with NSF 61</b>	Null	Pumps used to supply drinking water must conform to NSF 61.
<b>605.12.3</b> Modification	<b>605.12.3</b>	<b>Solder and Flux to Conform to NSF 61</b>	Null	Solder and flux used in making joints in pipe and tubing for drinking water systems must conform to NSF 61.
<b>605.13.6</b> Modification	<b>605.13.6</b>	<b>Solder and Flux to Conform to NSF 61</b>	Null	Solder and flux used in making joints in pipe and tubing for drinking water systems must conform to NSF 61.
<b>606.1</b> Modification	<b>606.1</b>	<b>Individual Tenant Water Shut-off Valve</b>	+	Multiple tenant buildings must have a main water shutoff valve for each tenant space.
<b>607.1.1, 607.1.2</b> Modification	<b>607.1.1, 607.1.2</b>	<b>Water Heaters Providing Tempered Water to Fixtures</b>	Null	New designs of water heaters are available where the temperature control of the water heater can provide reliable and accurate control of the temperature of the heated water.

<b>608.15.2.1</b> Modification	<b>608.15.2.1</b>	<b>Discharge from Backflow Preventer Relief Opening</b>	Null	Where backflow preventers can relieve indoors, the relief discharge must be directed to an adequately sized waste receptor.
<b>608.17.2</b> Modification	<b>608.17.2</b>	<b>Backflow Device for Low Hazard Boiler Applications</b>	Null	The code adds a recognized standard, ASSE 1081, for a combination pressure regulator/backflow preventer product for boilers.
<b>609.2</b> Modification	<b>609.2</b>	<b>Two Water Service Pipes for Group I-2, Condition 2 Healthcare Facilities</b>	+	Buildings classified as Group I-2, Condition 2 facilities require two water service pipes. The previous requirement for hospitals to have two water service pipes was vague, resulting in enforcement difficulties.
<b>609.2.1</b> Addition	<b>609.2.1</b>	<b>Tracer Wire for Buried Nonmetallic Water Service Piping</b>	null	The addition of a tracer wire on buried hospital water service piping allows for easier locating to avoid piping damage that would disrupt water service. <b>2021 CODE: 609.2.1 Tracer wire for nonmetallic</b>

### Chapter 7: Sanitary Drainage

Code Section		Section Title	Cost	Description of Change
2021	2018			
<b>Table 702.3</b> Modification	<b>Table 702.3</b>	<b>ABS Building Sewer Pipe Standard</b>	Null	A standard is added to the building sewer pipe table for a composite wall ABS pipe.
<b>705.2.4, 705.10.4</b> Addition	<b>705.2.4, 705.10.4</b>	<b>PVC and ABS Pushfit DWV Fittings</b>	Null	Push-fit fittings are a new type of DWV fitting for ABS and PVC piping that, when used, will reduce installation time.
<b>708.1.6</b> Addition	<b>708.1.6</b>	<b>Removable Fixture Traps Serving as Cleanouts</b>	Null	Removable traps and removable fixtures with integral traps are acceptable as equivalent to cleanouts.
<b>717, 718</b> Addition	<b>717, 718</b>	<b>Methods for Restoring Building Sewer Piping</b>	Null/-	The code recognizes two methods for restoring building sewer and building drain piping.

### Chapter 9: Vents

Code Section		Section Title	Cost	Description of Change
2021	2018			

<b>903.1.3</b> Addition	<b>903.1.3</b>	<b>Protected Outdoor Vent Termination Method</b>	-	New requirements for protected outdoor roof vent terminals accommodate solar panel and architectural roof feature installations.
<b>915.1</b> Modification	<b>915.1</b>	<b>Food Waste Disposers on Combination Waste and Vent Systems</b>	-	The prohibition of a food waste disposer discharging to a combination waste and vent system is removed.
<b>Chapter 10: Traps, Interceptor, and Separators</b>				
Code Section		Section Title	Cost	Description of Change
2021	2018			
<b>1002.1</b> Modification	<b>1002.1</b>	<b>Direct Connection to Hydromechanical Grease Interceptor</b>	Possible Amendment	A one, two or three-compartment pots and pans sink without a trap can be directly connected to a hydromechanical grease interceptor provided that the grease interceptor is in close proximity and connects to a drainage branch that has an emergency floor drain connected immediately downstream of the interceptor.
<b>1002.4.1.5</b> Addition	<b>1002.4.1.5</b>	<b>Fixture Drains Serving as a Trap Priming Method</b>	-	Waste from lavatories and hand sinks can be directed to floor drains, trench drains or floor sinks where such floor fixtures require a trap primer.
<b>Chapter 11: Storm Drains</b>				
Code Section		Section Title	Cost	Description of Change
2021	2018			
<b>1102.6</b> Modification	<b>1102.6</b>	<b>Roof Drains to be Tested and Rated for Flow</b>	Null	Flow testing and rating of roof drains is required to be in accordance with the referenced standards.
<b>1106.2.1</b> Addition	<b>1106.2.1</b>	<b>Rainfall Rate Conversion Method</b>	Null	Although the conversion from inches-per-hour of rainfall to gallons per minute (gpm) is not complicated, including the conversion information in the code is helpful.
<b>Chapter 12: Special Piping and Storage Systems</b>				
Code Section		Section Title	Cost	Description of Change

<b>2021</b>	<b>2018</b>			
<b>1202.1</b> Modification	<b>1202.1</b>	<b>Nonflammable Medical Gas Systems</b>	Skip	NFPA 99 covers the installation, testing and labels for nonflammable medical gases.
<b>Chapter 13: Nonpotable Water Systems</b>				
<b>Code Section</b>		<b>Section Title</b>	<b>Cost</b>	<b>Description of Change</b>
<b>2021</b>	<b>2018</b>			
<b>1301.1</b> Modification	<b>1301.1</b>	<b>Nonpotable Rainwater Standard Alternative</b>	null	Standard CSA B805/ICC 805 is added to the code to serve as an alternative method for providing a nonpotable water source.

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